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Creative Uses of Low Tech in Bamako Recording Studios (Mali)

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Creative Uses of Low Tech in Bamako Recording Studios (Mali)

In Mali, the introduction of 3G in 2010, alongside growing access to affordable digital audio technologies throughout the 2010s, has transformed local music industries and generated the multiplication of recording studios based on Digital Audio Workstations (DAW). Using an ethnography of Bamako DAW studios, this paper establishes a theoretical framework and a methodology to remap music production studies beyond the limits of a Northern-centric narrative. This framework discusses the notions of high vs. low tech and hifi vs. lofi within the 2010s' recording studio literature. Also, an expertise in audio engineering complements ethnographic methods to analyze synchronized video and audio recordings, computer screen captures, and dialog translations of complete recording sessions. Drawing upon the detailed description of a tradi-trap production, this paper contrasts local discourses and uses of globalized technologies to challenge the notion of low tech in Bamako studios and to highlight the constraints and capabilities of DAW practitioners.

Keywords: Recording Studio; Popular Music Production; Digital Audio Technology; Sonic Methodologies; Mali

Introduction

Musicking in Bamako in the late 2010s, as almost anywhere else, includes the use of digital audio technologies. From *griots*¹ and rappers through to *zikiri*² singers, all musicians produce singles and albums in recording studios (Duran, 2011; Olivier, 2014; Skinner, 2015) before broadcasting their music on radio and television channels (ORTM, Africable, Trace Africa), on social networks (Facebook and WhatsApp most prominently), or on free access local (Bamada-city, Kowbey, ZikMali³) and international (Youtube) streaming platforms. During performances in concerts or public or private ceremonies, many singers, especially in electronic popular music genres (hip hop, trap, Afrobeat, zikiri, etc.), use playback, and the audience essentially recognizes the music as it was recorded in the studio (Olivier, 2020).

This central use of digital tools in music production and diffusion has the effect of shifting “knowledge-power” relationships (Foucault, 1977) from elders to youths. Making music today is the business of this “3G generation” or “21st generation” (Olivier, 2017a), whose “capabilities” (Sen, 2000: 76 cited in Sarr, 2016, pp. 80–81) are located in a fully digital environment. The rise of hip hop, with its multiple local re-appropriations, is part of a movement towards the emancipation of a resilient youth, in Mali as in other West African countries (Charry, 2012; Niang 2014, 2020). But as much as the lyrics and the protest characteristic of this musical genre, it is the “technical virtuosity on non-traditional musical instruments” (Schulz, 2012, p.

¹ *Griots (jeli in Bamanan kan)* are men and women professional musicians from families who have historically sounded the praises of nobles, to whom they are affiliated to (Diawara, 1996; Duran, 2013, 2015).

² Local Islamic popular music (Olivier, 2019).

³ Zikmali is the only paid streaming platform (by subscription), which offers *m*-payment by Orange Money or bank cards (Olivier, 2020).

132), that is to say the mastery of digital tools, which allows them to acquire their own mode of expression, to make it a profession and to find a place within the local cultural industry.

To examine this “global soundscape wired for sound” (Greene, 2005, p. 14) from Mali, we establish a theoretical framework that considers audio technologies as dialectical relationships between globalized tools and cultural artefacts. By analyzing the local creative and technical uses of digital audio technologies, we propose to “remap” (Steingo & Sykes, 2019) music production studies within Malian sociological, political, and economic rationales and imaginations. Specifically, we question how the local uses of digital audio technologies contribute to either perpetuating or transforming this cultural context. Such questioning prompts an anthropological reflection on the “co-construction or the co-production of technology and society” (Pinch & Bijsterveld, 2004, p. 638).

In her study of music production in Johannesburg, South Africa, Meintjes (2012, p. 274) described the recording studio as “the nerve center of the creative process”. We observed the same phenomenon in Bamako through an ethnography of six recording studios that we carried out in July 2018 and July 2019. In these studios, the creative process of local popular music primarily involves two people, i.e., a singer or a rapper who pays a single studio practitioner to both program and engineer productions. All the studio practitioners with whom we worked were male digital natives in their 20s and 30s who referred to their profession as *arranger*, *beatmaker*, *designer*, or *engineer*⁴. However in this paper we refer to them as *arrangers/engineers* to highlight how the Bamako music production context differs from other digital production contexts, e.g., studios in Istanbul, Turkey (Bates, 2016) or closer to Bamako, in Dakar, Senegal

⁴ “Arrangeur, beatmaker, concepteur ou ingénieur” are the French and English terms that are locally used to designate this profession.

(Péneau, 2020), where the tasks of arranging and engineering are handled by two different people.

This paper focuses on local uses of globalized digital audio technologies, and specifically on Malian arrangers/engineers' constraints and capabilities. We first explain how our theoretical framework is inspired by an anthropological approach by Grimaud et al. (2017) grounded in Science and Technology Studies that applies historian Edgerton's notion of 'use' (2007) to go beyond the dichotomy high tech vs. low tech. We then discuss how these notions are highlighted in the late 2010s' recording studio literature. After detailing our ethnographic methods, we engage the reader in a "case study"⁵ (Passeron & Revel, 2005) by describing, step by step, a recording session produced by beatmaker Issa Sanogo (alias Backozy) and rapper Karim Traoré (alias Bessé) on July 7 and 9, 2018⁶. Finally, we draw upon analyses of our ethnographic data at large to challenge the concept of low tech as used in Bamako studios.

Low, high and wild tech in Sciences and Technology Studies

In the global North, technologies have been primarily examined from the perspective of their evolution in terms of innovations and improvements, and technical revolutions have characterized specific periods, e.g. the interwar period marked by electricity, automobile, and aviation; or the World War II and post-war periods associated with nuclear weapon, space travel,

⁵ Passeron and Revel (2005) defined their concept of "case study" by "any reasoning that, to forge a description, an explanation, an interpretation, and an evaluation, chooses to proceed through the exploration and deepening of the properties of a *singularity* that is available to the observer. Not to corner its analysis or rule its uniqueness, but to extract an argumentation from it that is more *general* in scope, whose conclusions could be re-utilized to forge other intelligibilities or to justify other decisions." (*ibid.*, p. 9, our translation).

⁶ A montage of the video capture of this session including the computer screen captures edited by Toby Bol a.k.a. Sykologist is available on [Youtube](#).

early computers, and the early Internet (Hughes, 1989; Pursell, 1995; Cowan, 1997; Misa, 2004). In this chronology of progress, any technological upgrade makes the previous technology obsolete, and high tech, a global-North privilege, is therefore defined by novelty. In contrast, definitions of low tech alternate between positive choices and negative constraints. In the global North, low tech is associated with hacking and recycling, thus supporting degrowth economics, sustainable development, and cooperatives, even covering various forms of resistance and criticism with regards to “the injunction to technological innovation” (Fourmentraux, 2017, p. 281). The DIY maker movement studied by Anderson (2012) follows directly from this post-modern logic of reappropriation of technology on a human scale which leads to the “long tail of objects” (Anderson *ibid.*). On the other hand, from a Northern-centric narrative, low tech refers to the global South and the ‘poor’ solution (Dittmar & Tastevin, 2017, p. 7), with its lack of robustness, absence of innovation, and fake copies of high tech. As an alternative to this dichotomy and drawing upon Cowan (1987)’s consumption junction and Oudshoorn and Pinch (2003)’s co-construction of users and technologies, historian Edgerton (2007) introduced the notion of ‘use’ to study technologies through their utilization, re-appropriation, and re-contextualization, while newer ones develop elsewhere. In addition to enabling different understandings of technologies, the notion of ‘use’ proposes a rethinking of the chronology of technologies beyond merely innovation and gives us access to societies that received scant attention in the Science and Technology Studies literature (Pacey, 1990; Bray, 2007; Edgerton, 2007).

Grimaud et al. (2017) extend the notion of use to explore other “productive paths”, which go against a binary view of technologies going from low to high tech. Through the examples of *slow tech* or even *no tech* in design, they state: “the history of techniques is entirely made up of bifurcations, of un-obvious choices, questioned and called into question, of

resurgences and experimentation” (*ibid.*, p. 14). Therefore, these authors encourage anthropologists working on a global scale to change the tools and models of analysis in order to call “this old paradigm of innovation” (*ibid.* p. 14) into question by underlining the various ways that technologies are being renewed. To do this, they propose the category “wild tech” to designate the unexpected use of a technology, such as the transcendence of the original technology to become a new technology (Dittmar & Tastevin, 2017: 9). As we explain in the next section, this alternative category is appropriate to identify creative audio engineering practices within a range of recording and production cultures. Nevertheless, we acknowledge that the authors’ choice of terminology carries the risk of further stereotyping dismissive associations to the global South, in particular to Africa. In this view, we remember that the *world music* movement first celebrated the “uncivilized” creativity of African musics meanwhile “civilizing” these musics to sell them to Westerners (Erlmann, 1994). We therefore rename this category “alt tech” (for alternative technologies) to analyze “assemblage forms” of creative processes (*ibid.*, p. 15) that vary depending on the location and that involve multiple references with or without associations to market-dominant practices, which in audio engineering primarily refer to the Anglo-Saxon recording and production lineage.

In this paper, we respond to Grimaud et al.’s invitation to develop a new topology of forms of technical innovation, no longer based on criteria of sophistication vs. tradition within operating chains or manufacturing processes, but on “[users’] capacity for recomposition in contexts marked by the heterogeneity of needs and challenges” (*ibid.*). With this in mind, we must recognize that the global South, and more precisely Mali, which is the subject of this text, calls mainly on digital audio knowledge already produced and invented in other parts of the world. From a methodological point of view, these technological transfers therefore invite us to shift our gaze towards the methods of appropriation, assembly, recomposition, transformation,

and diversion of technologies from elsewhere, without forgetting the difficulties and limits that users of these technologies may experience.

Audio technology categories in the late 2010s' recording studio literature

Most recording studios in the late 2010s primarily revolve around DAWs (Digital Audio Workstations) that are designed in the global North⁷ to record, arrange, edit, mix, and master music tracks entirely *in the box*. For instance, DAWs work with VST (Virtual Studio Technologies) *plugins* (digital audio signal processing modules as sound effects and samplers)⁸ that typically emulate analog signal processing technology and acoustic instruments, and that “have begun to rival and, to some ears, replicate or improve upon the sound of more bulky and expensive analog equipment” (Marshall, 2020). Indeed, requiring only a computer, a sound interface, and a pair of headphones to function, DAWs have enabled musicians and studio practitioners to build affordable studios around the world (Greene & Porcello, 2005; Bates, 2016; Bell, 2018). In privileged economical contexts, DAWs are integrated within traditional large-scale studios that feature a live room and a couple of booths (or more) with treated acoustics, a control room with a high-quality analog console desk and several sets of monitors, a customary collection of microphones and instruments, and pieces of audio signal processing hardware. The costs of building such as large-scale studio in the late 2010s starts at US\$1,000,000 (Bennett &

⁷ For instance, Fruity Loops (FL) Studio is developed by Image-Line in Belgian; Cubase and Nuendo are developed by Steinberg in Germany and by the Yamaha Corporation in Japan; Samplitude and Sequoia are developed by Magix in Germany; Live is developed by Ableton in Germany; Logic Pro was developed by Emagic in Germany then acquired by Apple in the USA; ProTools is developed by Digidesign that is now owned by Avid in the USA; and Reaper is developed by Cockos in the USA.

⁸ *Plugins* are digital audio signal processing modules that are compatible among DAWs; they can be sound effects (equalizers, dynamic range compressors, delays, reverberation, auto-tune etc.) or samplers (including banks of virtual instruments).

Barnes, 2019). In contrast, the costs of building a DAW studio in Bamako with used hardware equipment (computer, sound interface, keyboard, monitors, headphone, microphone), a small vocal booth, and free or cracked software licenses goes down to about US\$1,000⁹, so 0.1% of the cost of a large-scale studio. If there were a direct correlation between cost and quality, the *modern* DAW studio would be considered low tech, and the *traditional* audio technologies and infrastructures of a large-scale studio from the analog era would be considered high tech. However, this low/high tech distinction between the DAW vs. the large-scale analog studio primarily depends on historical and cultural contexts. For instance, while relying on DAWs and VST plugins to create the rhythmic sections and guitars of pre-digital popular music genres (e.g., rock or reggae) may be perceived as the ‘poor’ solution and thus low-tech, programming samples of virtual instruments for the beat of popular music genres that draw upon DJ culture (e.g., hip hop or electronic dance music) cannot be considered low tech.

Perceptual studies that compared analog versus digital audio mixing tools also challenge the association of *lofi* with low tech and its digital simulations. Indeed, results showed that recording producers, mixing engineers, and audio students describe audible differences between the two technologies (Tarr et al., 2014; Chambers-Moranz et al., 2019; Goold & Graham, 2019). Although they sometimes prefer one technology over the other for a specific subgenre or to complete a specific task, overall, they do not consistently rank one technology over the other.

⁹ At the Symposium on Feb 14, 2020, Ken Lagaré explained how much the second-hand equipment of his current and fourth DAW studio in Bamako cost him: CFA150,000 for his Behringer BCA 2000 sound interface; 90k for his computer; 150k for his Prodipt Pro 5 monitors; 30k for his Sony headphones; 75k for his MXL 550 microphone; 75k for his Yamaha MX61 keyboard; 30k for a 500Go hard drive; 15k for his voltage stabilizer; 80k for the construction of his vocal booth with a door; and 40k for his equipment desk. This amounts to CFA735,000, the equivalent of about US\$ 1,240.

These findings suggest that digital mixing tools have reached *hifi* (Morfi cited in Chambers-Moranz et al., 2019, p. 4).

Some millennials in privileged areas perceive the DAW studio as more authentic than the large-scale studio because DAW workflows enable ‘production as performance’ (Stuhl, 2014). Indeed, the technological affordances of the DAW have transformed the traditional production sequence of composing – recording – mixing into a fluid process that does not separate production stages (Bell, 2014, 2018). A study of the music-making practice of popular electronic music students in Norway associates this fluid process with the performance strategies of flow and improvisation (Røshol & Sørbo, 2020), to cope with ‘the paradox of choice’ (Schwartz, 2004) created by the DAW environment’s unlimited number of options. Such a ‘production as performance’ context does not necessarily involve trained and experienced recording studio professionals (Pras et al., 2013a). For instance, some millennials praise the use of approximate microphone techniques and noisy recording environment and equipment in their ‘DIY studios’ to produce lofi as opposed to *overproduced* commercial sound (Stuhl, 2014) and are motivated by analog nostalgia “against the clarity and perfection of digital audio” (Jones, 2019). This lofi process opposes analog fetishism, which holds that reputed analog hardware supposedly sounds better than digital technology and is thus considered hifi. As explained above, digital audio technology may sound as good as hifi analog hardware. However, the physicality of analog hardware can enhance creativity (Chambers-Moranz et al., 2019) and enable ‘mixing as performance’ (Anthony, 2017), leading to a dichotomy between ‘hifi mixing as performance’ and ‘lofi production as performance’.

In less privileged areas, some DAW practitioners claim that recording in challenging small acoustics with low-quality microphones generates a *local* sound that they recognize as more authentic than the sound produced in international-standard recording studios, e.g. in

studies about Istanbul DAW studios (Bates, 2016, 2019), Cairo's speakers (Puig, 2017), and Nepali pop productions (Greene, 2001). Nevertheless, Meintjes (2017) argues that low budget and independent studios in South Africa with inexperienced young sound engineers produces lofi, i.e., "the sonic result is muddy, making distinctive musical lines and expressive effects unclear" (*ibid.*, p. 219). While these low-budget and independent studios enable "new forms of empowerment in the postapartheid democracy" (*ibid.*, p. 216), "the desire for production autonomy and [...] performance authority compromise the possibilities for high-fidelity sound" (*ibid.*, p. 219). According to her, in South Africa, these low sound production values reduce "the range of [career] options that a recording might open up for [the musicians]."

Still in South Africa, drawing upon the work of Larkin (2004, 2008, 2013) on Nigerian video production, Steingo (2015, 2017, 2018) analyzes technical accidents and failures in Soweto DAW studios. He explains that some of these accidents lead musicians to develop new creative production processes, i.e., alt tech, while at the same time also having negative impacts on these processes, i.e., low tech. Whereas the accidents and failures that Steingo describes may be culturally situated and specific to unprivileged studios, transcending the boundaries of technology limitations to generate new creative processes has defined the history of popular music production, e.g., transforming a Reggae track into a Dub track with analog effects and console desks (Toop, 2004; Veal, 2013), or building a temporary studio on a beach in Honduras (Barnat, 2012). Moreover, Thompson (2018) details how audio engineers' and music producers' creative manipulations of sound represent the most important aspect of their job when producing popular music in the late 2010s' British commercial recording studios. Therefore, while tricks, sound manipulation, and 'digital imperfections' (Harkins, 2019) might be interpreted as alt tech from a culturalist perspective, they are globally inherent to the creative process of popular music and its fundamental concepts of 'using the studio as a musical instrument' and 'using the studio as a

compositional tool’ to ‘construct new sonic worlds’ (Eno, 2017, p. 127). In summary, hifi and lofi associations with high tech and low tech depend, in practice and in reception, on the socioeconomic and political context of creation. Moreover, the use of alt tech in recording studios is fundamental and observed globally, though take different forms in each culture of recording and production.

The music scene in Bamako (Counsel, 2003; Duran, 2011; Skinner, 2015) lends itself well to questioning the local uses of globalized digital audio technologies. Renowned for its national *folklore*, for the creativity of its musicians, and for its world music stars (Duran, 2014), it has nevertheless long remained artisanal, which mirrors a limited exposure to cultures of recording and production before the post-digital era, and underlines a particular relationship to audio technology that stems from a social history (Lysloff and Gay, 2003, p. 15–16) marked by transfers rather than appropriations. The arrival of digital technologies at the very beginning of the 2000s, then of 3G in 2010 (Olivier, 2017b) quickly changed the situation, leading to a real digitalization of music. This is reflected in particular by the proliferation of DAW studios, whose low-cost equipment is very comparable to that in the global North home studios. Those DAW studios have enabled the professionalism and creativity of a new generation of arrangers/engineers, and the dynamism of the local music market. This context is, however, affected by the security and multi-dimensional crisis (Gonin, Kotlok, & Pérouse de Montclos, 2013) starting in 2012 and continuing until the writing of this text (INSTAT, 2018; UNESCO, 2020)¹⁰, which has caused a slowing down, even a halt, in the international exchanges, both at the level of studio productions as well as in professional training or the organization of live events.

¹⁰ In 2020, the GDP per capita was of 2,424 \$; in 2018, the literacy rate of the population of 15 years of age and above was of 35,5% (UNESCO).

Ethnographic methods complemented by an Audio Engineering expertise

To examine in depth creative and technological uses in Bamako DAW studios, we have developed a methodological approach that pairs Pras's expertise in music production and audio engineering with Olivier's anthropology of recording studios and music listening practices in Bamako since 2013 (Olivier, 2014, 2017a, 2017b, 2017c, 2020). Our ethnography primarily consisted of recording and filming seven complete production sessions in six DAW studios in Bamako in July 2018 and July 2019, corresponding to 600 Gb of audiovisual data, which includes more than 35 hours of recording sessions and 20 hours of interviews. With two cameras, we captured all the gestures and interactions of the arranger/engineer and singer/rapper, as well as other events such as musicians and friends' visits, tea services, etc. When possible, we also collected DAW screen captures with BSR Screen Recorder software. Also, we recorded the creative process of the production together with the studio ambience and the dialogues with a Royer SF12 ribbon stereo microphone that we placed just behind the head of the arranger/engineer in the axis of the studio monitors. This 'single' -though stereo - perspective enabled us to explore the sound of the production as it was heard in the studio space by the arranger/engineer and the client (Thompson, 2020), and to capture all the extra-production sounds such as dialogues, phone ringing, animal sounds etc. The dialogues were transcribed and translated from *Bamanan kan*, the vernacular language of Mali (Dumestre, 2003), to French by Soumaïla Camara, a professor of Bamanan kan at Master SOCDEV at the Faculty of Humanities and Education of Bamako¹¹. We synchronized the video shots, screen captures, and stereo

¹¹ The various protagonists could choose to express themselves in French or in Bamanan kan. Given our limited mastery of the language, in the field the translation from Bamanan kan to French was done by our research assistant Mamadou Kossinantao.

recordings with French subtitles in Adobe's Premiere Pro, which enabled our team to carry out multidisciplinary analyses (see more details on this multi-layer device and preliminary digital audio analyses in Pras et al., 2019).

These recordings of complete recording sessions are augmented by twenty interviews of DAW studio owners and practitioners. During our second field mission in July 2019, we also carried out *self-confrontation* interviews (Theureau, 2003) with some of them. Also filmed, these 2019 interviews consisted of viewing excerpts from the video recordings and screenshots taken in 2018 together. These excerpts served to support our investigation, as they allowed the arrangers/engineers to explain and clarify or to specify what they said and what actions they took the year before.

The data analyzed in this paper is also put into perspective by data from surveys and interviews carried out with other practitioners within this new post-digital music ecosystem: musicians, intermediaries / entrepreneurs, media, but also the audience, telephone operators who sell digital downloads as well as streaming options, and finally public institutions. This ethnographic data was coupled with ongoing work on professional audio and music production programs in Bamako art institutions, social networks and local streaming platforms used in Mali, as well as a review of local press articles, official and corporate documents.

Description of Backozy-Bessé Recording Session on July 7 and 9, 2018

Backozy Beats Design Studio

Backozy Beats Design Studio had existed for about a year when we filmed Bessé's recording session (Figure 1). With a mechanic father and a midwife mother, 24-year-old Issa Sanogo (alias Backozy) graduated from a Master's in English. He worked as a beatmaker for a few months at

the recording studio of Bamada-City, a local business that finances, produces and broadcasts Malian music on a free streaming platform, before building his own studio. Without formal training in music either audio production, Backozy learned his studio skills *on the job* by observing sessions in two local DAW studios, i.e. Star Records with arranger/engineer Booba Six and Dr Pesh's studio, and by watching Youtube tutorials. Backozy quickly gained some notoriety as a beatmaker, which attracted clients from hip hop, Afro-trap, and zikiri. He also delivers beats through WhatsApp to Paris-based musicians from the Malian diaspora.



Figure 1. Karim Traoré aka Bessé (left) and Issa Sanogo aka Backozy (right) in Backozy Beats Design Studio.

Backozy Beats Design Studio is situated in a busy street of Banconi, a popular and historical district of Bamako on the left bank of the Niger. It consists of a 20m² room with a tiny (about 3m²) booth built to record vocals. A Malian flag and a tag of the studio name (Figure 2) above the computer desk dominate the room. The walls are painted with bright colors; they are not acoustically treated. Also, the studio opens onto the street without efficient acoustic isolation,

so motorbike engines get recorded. Outside, the studio name and phone number are painted around the door (Figure 3), where singers and rappers wait (sometimes for long hours) on a bench. Friends and managers hang out with Backozy and Bessé. Inside, everybody can give their opinion on the takes. Once in a while, Backozy opens the door to bring some fresh air, to greet those waiting, and to commission some teenage boys to make tea or bring back some food. We were welcome to bring our cameras and stereo microphone in this friendly and open atmosphere.



Figure 2. Backozy Beats Design Studio tag.

Beat Production and Recording of the Chorus and Two Verses of Djougouya on July 7, 2018

Based on the success of his first hip hop single, Karim Traoré (aka Bessé: “Machete”) is coming back to Backozy Beats Design Studio. A young rapper from Banconi, Bessé is also an apprentice in a tailor's workroom. Actually, the revenues of his first concert performance enabled him to buy a sewing machine. This time, he wants to produce a tradi-trap track named *Djougouya* (*Selfishness*). Tradi-trap is an emerging genre in Mali that combines rap and so-called *folklore*,

i.e. music that has been recorded by national orchestras since the Independence in 1960 and that was recently digitized and uploaded on Youtube (Mazzoleni, 2013; Olivier, 2017b). As Backozy explained (in French): “*We make the mixtures between traditional melodies and hip hop*”¹².



Figure 3. Front door of Backozy Beats Design Studio in Banconi.

Bessé arrives at the Studio with the track’s chorus, whose melody draws from the song *Bakari Dian*, recorded in 1970 at Radio Mali by Super Biton de Ségou¹³, one of the emblematic Malian orchestras, released on vinyl by *Bärenreiter-Musicaphon* (BM30L2601) (Counsel, 2003), recently digitized by Senegalese label Syllart Records and now available on Youtube. He tells us that this song is very familiar to him as his father often listens to it on his cell phone. He has also written the first two verses in his notebook. The atmosphere is relaxed: Bessé tells Backozy that

¹² “*On fait le panache entre mélodies traditionnelles et hip hop*” (Backozy, interview conducted on July 18, 2018 in Bamako).

¹³ <https://www.youtube.com/watch?v=S2ceT-QTSdE>. For a detailed analysis of *Bakari Dian*’s legend, see Dumestre (1979).

he has just bought himself a motorbike; Backozy makes fun of him. Two musician friends and one manager observe the session on a bench at the back of the room when Bessé and Backozy start working.

They decide on the tempo in *bpm* (beat per minute) together. Bessé repeats the chorus while Backozy plays the melody and starts producing the beat on his MIDI keyboard with a rhythmic pattern that belongs to Bambara people from Segu (*Bamana foli*). Backozy pairs two DAWs, i.e. he injects virtual drums samples of FL Studio into his MIDI programming in Cubase 5, a technique known as *rewire*. He improvises a rhythmic counterpoint while listening to Bessé's singing and rapping in *Bamanan kan*. At an incredibly fast pace, he adds, records, processes, and edits new layers to design the instrumental (see Bell et al., 2019). He selects instrument samples from different banks of sampler plugins (e.g. Nexus, Sample Tank). To best emulate Western African drums, he chooses the Kontakt *Tam-Tam*. We are impressed by the virtuosity of his 'arrangement performance' based on musical gestures to manipulate rhythms, melodies, timbres, and pitches simultaneously. Backozy completes the base of the beat instrumental in less than one hour.

Ready to record the chorus, Bessé wears headphones in the tiny vocal booth and waits for Backozy to signal when he can start (Figure 4). The chorus is sung, while the verses are rapped, which is common practice today in hip hop and trap in Mali. Backozy is demanding with Bessé's vocal performance. He imposes the structure of the chorus, and he proposes variations for the interpretation of each of the four repetitions of the same musical phrase, e.g. "*At the end you need to come up*"¹⁴. Bessé performs new takes without challenging Backozy's authority.

¹⁴ "*Fô laban de yèlèn*". Backozy and Bessé talk to each other in Bamanan kan.



Figure 4. Karim Traoré aka Bessé recording vocals.

Then, they record the “*backs*” (backup vocals) and the “*vibes*” (onomatopes) to enhance the main vocals but with different registers and textures. Backozy keeps revising the instrumental between vocal takes, which he refers to as “*pre-mixing*” (in French). Since the beginning of the vocal recording, Backozy processes Bessé’s voice with equalization and a heavy amount of auto-tune using the *T-pain Effect* (named after the American rapper T-Pain). He explains to us that rappers expect the use of auto-tune as an aesthetic effect and not just as a pitch corrector. Backozy likes T-Pain, which he characterizes as “*smoother*” (in French) than other auto-tune plugins in its “*ironing out*” (in French). We were surprised by the term smooth as T-Pain introduces a lot of auto-tune artifacts, so he explained *smooth* here meant fewer pitch variations.

After the chorus, Backozy coaches Bessé’s performance for the first two verses with straight-forward requests, e.g. “*It’s good but do it again! Do it again! You need to be more*

serious!”, “*Well, now you need to make variations*”, or “*Give me another one like this*”¹⁵. We should mention that Bessé does not yet enjoy much notoriety, just local stardom, which could explain his willingness to follow Backozy’s requests. Bessé’s friends and manager comment on the takes and encourage him. Another singer who has an appointment to work with Backozy that afternoon shows up, and quickly closes the door without generating any reaction. Despite the ambient noise and our presence, Backozy remains focused. At some point he sets his limits by telling Bessé “*we won’t resolve it today*”¹⁶, referring to the third verse that has not been written yet. He then masters what was completed during this first session and sends it through WhatsApp, so that Bessé can prepare for the next session.

Recording of the Third Verse, and Finalization of Djougouya on July 9, 2018

Two days later, we meet Bessé and Backozy at Backozy Beats Design Studio to observe the continuation of the production of the tradi-trap track *Djougouya*. They start by recording the third verse. Again, Backozy is exacting with Bessé’s vocals performance but this time, Bessé also brings his input regarding the balance of intensity between the instrumental and the vocals (Figure 5). He also questions the editing, e.g. “*Man, did you remove this part?*”¹⁷ They find a balance in the music, and in their relationship. Backozy keeps revisiting the instrumental while editing and recording new vocals.

Once the verses are all recorded, it is time to create the *outro* (*retoro* in Bamanan kan), a term often used in hip hop production that locally features a series of *dedications*, calling the

¹⁵ “*A ka nyi mè segin a kan! Segin a kan! I bè seriye k’a la kuwa!*”, “*Bon, i b’a variye sisan*”, “*Nin kelen wèrè diyan*”.

¹⁶ “*Ha o kôni tè nyènèbô bî*”.

¹⁷ “*Ayi Bako, i b’o yôrônin tigè yèrè de*”.

names of the artist's sponsors, referred to as *patrons (jatigi)* (Diawara, 1996; Duran, 2013, 2014).

Backozy does not particularly enjoy this essential production step: “*That’s tiring. I hate it so much!*”¹⁸. These dedications aim to attract new sponsors to the artist’s future live events (stage performances and private parties), and to prompt his current sponsors to give him money when they hear their name (Keita, 2015, pp. 127–128).



Figure 5. Karim Traoré aka Bessé coming out of the vocal booth.

The recording stage is complete. When we ask him what he means by mixing, he answers (in French) “*adding or removing instruments*” (in French). Also, he mentions, “*In Europe... Mixing here does not take long*”¹⁹. The balance, pans, and signal processing (equalization, dynamic range compression, etc.) of the different layers happen simultaneously with the recording and vocal editing stages. Backozy sometimes adjusts the effect settings of equalizers and compressors from a template, but he does not dedicate a specific moment for this

¹⁸ “*Ça, ça me fatigue. Je déteste ça jusqu’à en mourir.*”

¹⁹ “*En Europe... Le mixage ici, ça ne prend pas trop de temps.*”

type of processing. In contrast, he keeps enhancing his arrangement of the instrumental and his editing of the vocals. Specifically, he modifies the editing of the *backs* and delete some of them. At some point, the computer crashes due to a power breakdown, which occurs once a day on average in Bamako. Then, Bakozy has to redo some of the work that he has lost from because he does not save the session regularly.

Before mastering the finalized track, Backozy adds his sound signature at the beginning of the track, i.e. a short jingle on the introduction before the singing starts. This signature helps the audience to recognize his work as a beatmaker, which brings him more clients. According to him: “*Rappers also like it, because when beatmakers have some influence, everybody wants to produce their tracks with them. If you have a sound signature [on your track], that means that you have some influence*”²⁰. Finally, Backozy compiles and exports the track from Cubase 5, and then opens it in Samplitude, a DAW locally known to be appropriate for mastering. He only spends a couple of minutes on it, adding plugin presets of compression and equalization that, according to him, he uses on every track that he produces. Before sending it to Bessé through WhatsApp, he listens to the master with great attention. A few days later, *Djougouya* is available for streaming on Bamada-city’s platform as an embedded Youtube video²¹.

Challenging Low Tech in Bamako Recording Studios

Bamako Low Tech DAW Studio Setup and Representations from the Global North High-tech Studio

²⁰ “*Les rappeurs aussi aiment ça. Parce que les beatmakers qui sont influents au moment, tout le monde veut faire leur projet là-bas. Donc, s’il y a la signature, ça veut dire que toi aussi tu es influent.*”

²¹ <https://www.youtube.com/watch?v=-XFyRNY2MzM>.

Like most recent Bamako DAW studios, Backozy Beats Design Studio consists of a small room with no acoustic treatment or isolation, and it is located in a popular or suburban district. These characteristics underline the lack of concern for acoustics, as well as the modest revenues of these recent studios and their owners' status as *cadets*, a social category in West Africa that includes women and youth (Meillassoux, 1975; Bahi, 2013; Bagayogo & Coulibaly, 2014). Backozy Beats Design Studio features a new Yamaha PSR-262 MIDI keyboard; a (basic) large condenser microphone with a pop-filter; three sets of monitors; a pair of wireless headphones that he has to share with the client; and a second-hand computer with Windows XP that is compatible with the free and cracked licenses of three DAWs, i.e. Cubase 5, FL Studio, and Samplitude, and an extensive collection of plugins (among others Nexus, Kontakt, T-Pain). This digital setup is common to most DAW studios around the world. On the other hand, we did not observe analog pieces of hardware that are available in most DAW studios in more privileged areas and that are known to Bamako arrangers/engineers. For instance, when we asked Backozy how he processed Bessé's vocals, he specified (in French): "*Here, I'm going to compress a bit. Because there is no pre-compressor here. So we compress with effects [plugins]*"²². Here Backozy referred to high tech analog dynamic range compressors whose placement varies in the production chain, e.g., before the recording device (which is not possible to emulate with a plugin in the DAW), in the middle of the mixing chain, at the end of the mastering chain. Also, in the analog studio tradition, such 'out-board' or 'out-DAW' technology is praised for its tactility and specific sonic *flavour* (Chambers-Moranz et al., 2019). By naming this piece of gear a "pre-compressor", Backozy highlights that he does not have access to this high tech equipment, which he only associates with

²² "*Là, je vais mettre un peu de compresseur. Parce que là, on n'a pas de pré-compresseurs ici. Donc on compresse avec les effets.*"

the ability to compress the vocals before the recording. He thus refers to tutorials and making-of videos of hip hop tracks that emphasize such practice in more privileged areas than Bamako.

Some of the Malian DAW studio practitioners we interviewed mentioned their wish to have a *live studio*, using the English terms *studio live*. This wish refers to the traditional analog studio, in which they could record several acoustic and electrified instruments simultaneously such as, kora, n'goni or guitar, instruments that they consider as superior to virtual instruments since they are closer to the tradition. However, while their semi-pro sound interfaces usually feature more than one microphone input and some of their studios would have the space to host a live studio, they settle for using virtual instruments, combining local and westernized samples, and recording maximum one instrument at a time. For instance, they largely use the Tam-Tam sampler of Kontakt's bank of virtual instruments because it sounds local. In contrast, they choose different bass drum sounds depending on the musical genre of the track, following international trends. They mentioned to us that there were not enough virtual Malian instrument resources, e.g., they use marimba samples to emulate balafons. When we asked Backozy whether he knew how to sample, he told us that once, he sampled a sound effect, but never a musical instrument. To our knowledge there is no building or exchanging of local banks of virtual instruments in Bamako nor there is any trace of sampling techniques from the early digital era (Shelvock, 2020), in contrast for instance to Dakar (see Peneau, *op.cit*). The fact that Malian arrangers/engineers primarily use samples can be explained by several factors, namely limited technological access, lack of room acoustics and microphone technology knowledge, economic challenges, and production time constraints. Nevertheless, we noticed both a desire for tradition (using acoustic instruments) and a desire for global modernity (using sampled instruments) when they justified their choices of production. For instance, the fantasy of the live studio with acoustic instruments is partly inspired by the authenticity of national folklore that was recorded after Independence

(Counsel, 2003; Djebbari, 2013), which indicates a ‘closure of identity’ (Bayart, 2017) of this generation in reaction to the current Malian political crisis. On the other hand, the combination of local and westernized sonorities also observed in other music production contexts, e.g., in Nepal (Greene, 2001) or in Turkey (Bates, 2016), transcends nationalism and symbolizes their wish to access the world music market. Also, their desire to see more Malian instruments in sample libraries suggests a wish for their culture to be recognized and to participate in the “global imagination” (Erlmann, 1999) of African music.

Typical of the setup of other DAW studios that we visited in the city, Backozy’s cracked licenses have been outdated for five to ten years, e.g., Cubase 5 was released in 2009; the T-pain effect bundle has been discontinued since 2011. Nevertheless, digital audio technology does not sound drastically better ten years later. The economic gap does not operate here.

Similar to what Larkin (2004, 2008) and Steingo (2015) observed in Nigeria and South Africa, Bamako computers crash easily because of power breakdowns and heat²³. Whereas most small studios we visited were equipped with a fan and/or a small AC device, those could not be used during the sessions because of their noise. Computers crash easily also because of the functioning of too many plugins like reverberations that require a lot of processing power on every track. Of course, these technological failure and limitations slow work down, but unlike Steingo (2015, pp. 103–104), we did not observe these issues interfering with the workflow and creative process.

When young arrangers/engineers decide to buy new equipment such as a MIDI keyboard, an electric guitar, or a semi-professional sound interface (e.g. Behringer, Edirol,

²³ Our high-tech cameras also crashed during most recording sessions in Bamako because of the heat.

EziDAB, Focusrite, MOTU, Presonus, Tascam), they are limited by the absence of local distributors of international brands, apart from Apple's distributor in Bamako whose prices are inaccessible to the young professionals. The local markets sell 'made for Africa' equipment from Chinese manufactures, which does not work or breaks easily. If they order equipment abroad, they have to pay expensive freight fees because there is no shipping in Mali and the equipment is likely to be stolen on the way. Moreover, only those who have an international bank card can do so, which is the case only for a small number of Malians (BCEAO, 2019). Therefore, the solution is either to buy second-hand equipment through *France aurevoir* (local expression that designates used machines from Europe that have a second life in Africa) or its equivalent, or to rely on family members, friends, or colleagues who can bring some equipment back from France or North America.

So far, we did not observe ideological positioning in Bamako around the use of low tech equipment, nor did we heard discourses about hifi and lofi aesthetics preferences. It seems that the use of low tech depends on the arrangers/engineers' access to equipment. Bamako popular music is therefore produced based on "material contingency" (Golsenne, 2015, p. 29), i.e., arrangers/engineers "get by as best they can" (Dissanayake, 1988), pointing to an *aesthetic of contingency*. Also, by extending the use and the lifespan of their DAWs, arrangers/engineers *capitalize* on their digital audio knowledge. In other words, they balance the benefits of using more recent DAW versions in terms of access to new technical features and compatibility with the global market, with the required time to learn these new features, and the potential increase in revenues that these more recent DAW versions could generate (e.g., new clients, increase of rates). Locally, using outdated digital tools does not prevent them from working with others as they all use the same outdated operating system and DAW versions. However, using outdated digital tools prevents them from accessing the global industry for which studio practitioners need

to update their licenses regularly to stay compatible with other ‘network’ studios (Théberge, 2004).

Technical Skills and Creative Use of Technology

Our description of Backozy’s creative process highlights his virtuosic use of the DAW for editing and arranging. Especially his use of the rewire technique to feed Cubase 5 with samples from FL Studio demonstrates his advanced digital literacy. Among the different studios in which we filmed recording sessions, we observed a large range of DAW practitioners’ musicianship skills, though we found a consistency regarding their mastery in arrangement and editing. Indeed, they go into details for hours revisiting their arrangement through MIDI programming, MIDI editing, and pitch correction (Pras et al., 2019). Regarding pitch correction, we noticed that all the arrangers/engineers we interviewed had a discourse, though with different uses of auto-tune. For instance, Backozy likes the sound of the T-Pain auto-tune because it’s smoother, so it homogenizes the vocals even more than other auto-tune plugins. Another arranger/engineer uses T-Pain to see where the voice shakes as an indicator of tuning, i.e., if the voice shakes a lot with T-Pain, it needs to be redone. These different uses of T-Pain illustrate some transformations and innovations in Malian’s uses of digital audio technology that was designed abroad, and that can be considered alt tech.

Whereas Backozy allocates most of his time to programming, arranging and editing, in his studio as well in the other studios we visited, we did not observe dedicated sessions for “mixing” defined as “creating a new coherent and expressive sound from the multitrack”²⁴

²⁴ “Le but du mix est en fait la création d’un nouveau son cohérent et expressif à partir des éléments donnés” (Mayitoukou, 2016, p. 238)

(Mayitoukou, 2016, p. 238) with signal processing and balancing levels. Indeed, the Malian arrangers/engineers provided us with only little information about their use of signal processing tools such as equalizers and dynamic range compressors, and we never saw them using level automation features beside for fading out the end of some tracks. However, our DAW analyses underlined Backozy's re-semantization of the word *mixing* to refer to substantial re-arrangement sessions of adding and deleting instrumental segments, therefore enabling the vocal tracks to shine and reducing its masking by the instrumental. We observed that each arranger/engineer has developed unique 'sound sculpting' techniques based on additive and subtractive MIDI programming to underline the vocal tracks, instead of relying on digital signal processing such as equalization, compression, and automation to avoid masking among sources. In other words, they somehow replace signal processing by extended arrangement techniques based on musical listening skills. Therefore, through their detailed arrangement sessions, they re-appropriate the performative use of the DAW as a musical instrument, beyond increasing fluidity across the traditional production stages of 'recording-editing-mixing-mastering'. Also, we saw that they used plugin presets to master their tracks within a couple of minutes. Together, our findings indicate that Malian arrangers/engineers lack less the access to high tech equipment than the access to professional training. This observation is in line with their demand for more training opportunities.

Our analyses of the interactions between the arranger/engineer and their client (a singer or a rapper) revealed that Bamako production is performed with balanced artistic involvement between the two parties. We can see here how much these "ways of doing" (De Certeau, 1980) arise from a different path of production, corresponding to what was qualified as "alt tech" in the literature review. The fact that these ways of doing are shared by the arrangers/engineers with whom we worked in Bamako suggests that they are the subject of exchanges, or even

transmission among them. Further fieldworks will investigate local and regional knowledge transfers, and whether this production workflow occurs in other parts of West Africa.

In terms of the end product, several arrangers/engineers explained that they train their ears by listening to *references* such as popular music productions from France and the USA, e.g., Jay Z, Booba, on international platforms such as YouTube. While they shared with us their aim to achieve similar results for the vocal presence and general loudness of these references, they perceive that their tracks are not as *powerful* or as *loud* as these successful commercial productions. From an audio engineering perspective, they do not yet achieve these international standards because of their limited use of signal processing. From a music industry perspective, Malian productions that access the global market are mixed and mastered abroad, which can be qualified as a novel “industry patronage” (de Beukelaer & Eisenberg, 2018, p. 11) from the North to West African countries. Besides creating a frustrating situation for Malian DAW practitioners, the internationalization of the mixing and mastering stages impacts the music's cultural identity. For instance, an arranger/engineer told us that “adding reverberation on certain recordings of the traditional instrument *n’goni* could be perceived as a lack of respect for a specific spiritual music practice” (Pras et al., 2019). Together, these observations concur with Malian arrangers/engineers’ request to have more access to audio professional training in order to enhance their capabilities and to be recognized at the global level.

Conclusion

Using a grounded ethnography of Bamako recording studios carried out in 2018 and 2019, this paper proposes a theoretical and methodological framework that incorporates the notions of high tech, low tech, and alt tech based on an anthropological approach of Science and Technology Studies (Grimaud et al., 2017) into the field of audio production. This framework enables

researchers in Sound Studies, Popular Music Studies, and Digital Studies to think beyond the limits of a “Northern-centric narrative” (Steingo & Sykes, 2019, p. 25) in order to highlight interconnections between the uses of globalized digital audio technologies and music ‘socialities’ (Born, 2011, p. 2015) in global South creation contexts. In this view, we described a recording session in Backozy Beats Design Studio chronologically to engage the reader in the creation context of Bamako studios in order to ‘remap’ music production studies from Mali. Drawing upon this case study, we discussed findings of our ethnography and challenged global South low tech in the post-digital era. In Bamako where the digital landscape is not a “*regime* of abundance” (Rifkin, 2001) and where a security and multi-dimensional crisis since 2012 has led millennials to a ‘closure of identity’ (Bayart, 2017), the ‘3G’ or ‘21’ generation of arrangers/engineers neither claim to produce lofi nor do they aim to transcend technical failures. Instead, they express their need to access professional audio training programs and their desire for their work and culture to be recognized on the global music market.

To further contrast Malian DAW practitioners’ discourses with their creative and technical uses of digital audio technologies, we contributed a novel approach that complements ethnographic methods with audio engineering expertise. By analyzing the local uses of the DAW as a “sound recorder” that require “craft and editing and articulation just like writing” (Feld & Brenneis, 2004, p. 471 cited in Samuels et al., 2010: 330), our ‘sonic methodology’ provides anthropologists with access to “the complex interactions of social, scientific, economic, and aesthetic contexts in technological development and use” (Bruyninckx & Supper, 2020, p. 201). Specifically, we designed a multi-layer analysis device that synchronizes videos from two cameras, audio recordings from a high-quality stereo microphone, computer screen captures, and subtitles from dialog transcriptions and translations, to examine complete music production processes in recording studios from multidisciplinary perspectives. Without such a device, we

would not have identified the ‘sound-sculpting’ techniques that Malian arrangers/engineers developed to “mix” and generate unique sound signatures in their DAW. Multidisciplinary analyses also informed the high level of artistic involvement of these DAW practitioners (Pras et al., 2019) through their assertive interaction with their singer or rapper client, thanks to their knowledge of digital audio technologies. In parallel, our investigation of the Malian music industry highlighted how arrangers/engineers’ sound signatures are locally successful and how the development of studio practices participates to economic growth and youth empowerment. Nevertheless, our analyses revealed that a lack of advanced audio programs and “infrastructures” (Larkin, 2013) in Bamako prevents local studio practitioners from achieving global audio standards, and therefore from mixing and mastering the productions of Malian touring artists.

This paper lays the foundations of a partnership between two international research and education programs. Olivier coordinates Digital Cultures in Western Africa – Music, Youth and Mediation (AFRINUM, 2019-2024) that involves 14 researchers, 5 PhD candidates and 4 Master students from Canada, France, Ivory Coast, Mali, Senegal, and the USA. Pras coordinates the West African Audio Network (WAAN, 2020-2023) that facilitates emerging African sound engineers’ access to professional training locally and abroad, and that enhances established African sound engineers’ international visibility and participation in professional organizations such as the Audio Engineering Society. The approach presented in this paper will be further applied and extended to compare our findings from Bamako with other West African fieldwork outcomes to draw out idiosyncratic and shared regional DAW practices, and to understand how digital audio knowledge and practice circulate within the region and between West Africa and other parts of the world.

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