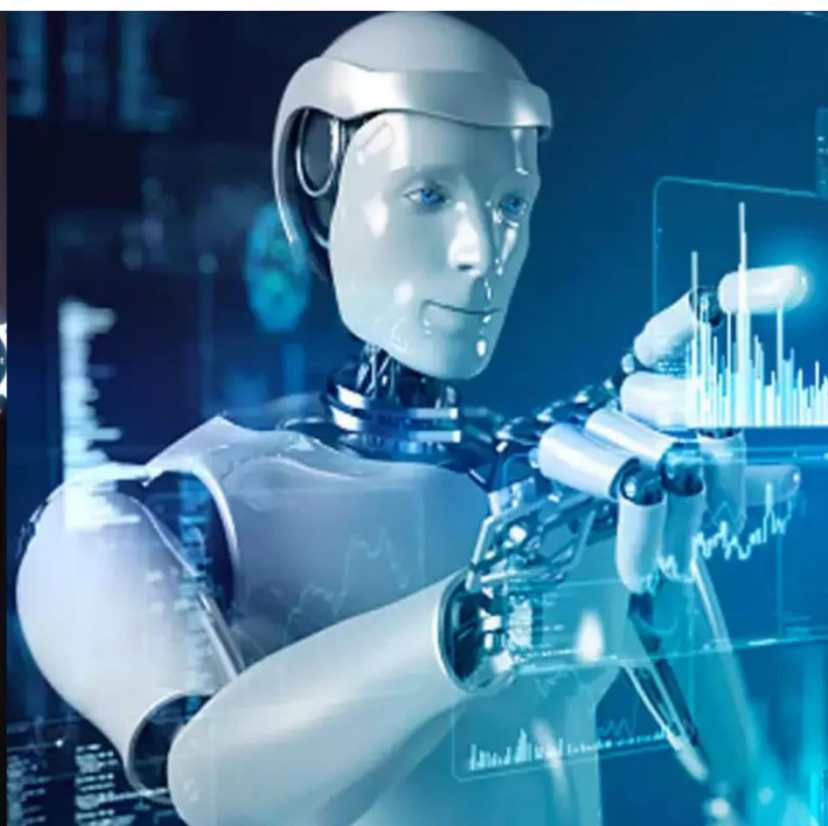




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Reconciliation of Land Governance and Peasant Activities in the Betsiaka Gold Mining Zone, Northern Madagascar

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ABSTRACT: Gold mining, agriculture and livestock farming are the three juxtaposed peasant activities in the gold-bearing area of Betsiaka. This study attempts to model the type of current local land governance in order to identify the different actors involved. Betsiaka is the only artisanal gold mining area governed by the DINA. These are regulations approved in the form of law at the local level, regulate activities and provide temporary solutions to conflicts. This type of governance organizes modes of access to land and peasant activities. Small-scale artisanal gold mining becomes a main activity and a more important source of income for the inhabitants of Betsiaka followed by agriculture and livestock farming. Most of these gold extractions and land appropriations in this area are done informally, thus generating various problems of land rights. This context makes the current land governance. This fragility is an opportunity for miners to the detriment of local farmers. This situation leaves traditional or legal land owners on their own after the operators leave. How can land governance reconcile peasant activities with artisanal mining?

KEYWORDS: Governance, land, gold, exploitation, Betsiaka, DINA.

I. INTRODUCTION

In Africa, as in Madagascar, land and its associated resources are considered common goods, with their use, access, and management collectively decided and organized^[1]. The overlapping of land rights is frequently observed in rural Malagasy areas^[2]. The Rural Commune of Betsiaka, located in the Ambilobe District of the DIANA Region, is a gold-bearing area rich in both renewable and non-renewable natural resources, including surface and sub-surface assets. Additionally, the region's topography and climatic conditions encourage local populations to engage in multiple livelihood activities^[3]. It is noteworthy that the area is widely recognized for its gold mining, which serves as a primary source of income and employment for the population of Betsiaka. However, most of these gold extractions are informal in nature and take place on cultivated fields, within protected areas, and on rice paddies.

Moreover, a form of land governance governed by a Dina (customary community agreement) has existed in the area since 1993 (local source). This raises a critical question: how can land governance be integrated with mineral resource management without undermining rural livelihoods? The objective of this study is to model the current form of local land governance in order to identify the various stakeholders involved.

II. LITERATURE SURVEY

The study area is composed of four (04) sectors: Betsiaka, Labaika, Ankatoko, and Ambilo. All of them are located within the Rural Municipality of Betsiaka, in the Ambilobe District (Figure 1). The bedrock in these sectors is mainly composed of mica schist, sandstone shale, amphibole-bearing orthogneiss and quartzite. These lithologies account for the abundance of quartz veins and also help explain the presence of gold extraction activities. The Betsiaka geological formation emerged in the northwest of the Bemarivo domain around 2,477 Ma ^[4]. It is separated from the Permo-Triassic sedimentary cover to the north by a normal fault. Gold occurs both in free form and associated with sulfides within metamorphic and volcano-sedimentary rocks, indicating a hydrothermal origin linked to regional deformation. The gold mineralization in the Rural Municipality of Betsiaka is primarily controlled by polyphased tectonic events.

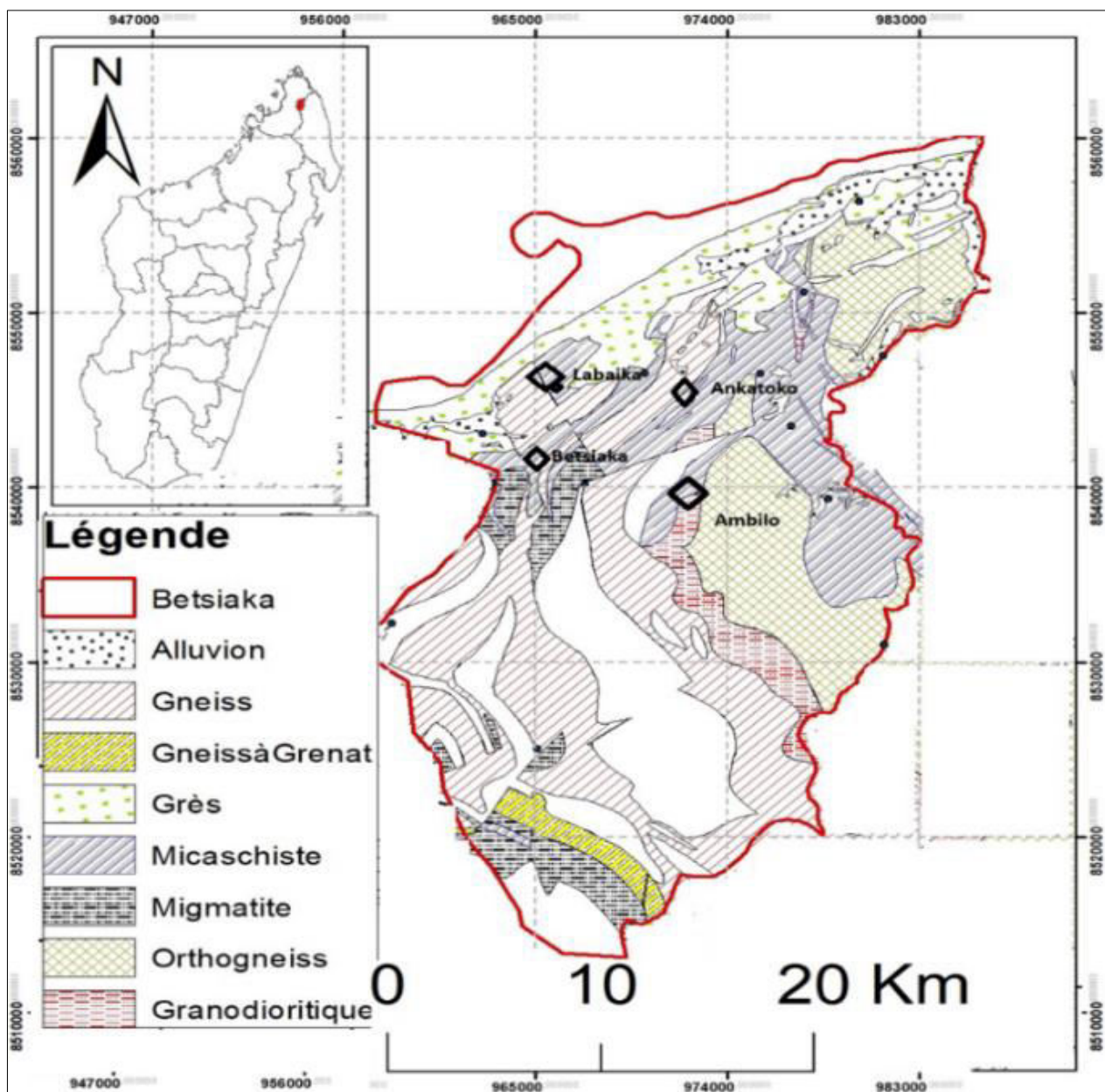


Fig 1: Location map of the study area (Source BD100, modified by Beny, 2025).

III. METHODOLOGY

During the study, a literature review was conducted. Courtesy visits were also made to administrative and traditional authorities. The aim of these interviews was to ensure local ownership of the research topic. In addition, household surveys were carried out, covering 30% of the households. The qualitative and quantitative data collected were subsequently organized and processed. Descriptive analyses were then conducted to assess the distribution of activities. Finally, qualitative analyses were performed to understand the evolution of land governance.

IV. EXPERIMENTAL RESULTS

The Betsiaka gold-bearing area encompasses three main rural activities: gold extraction, agriculture and livestock farming (Figure 02a). The gold in Betsiaka is found within quartz-barite veins (Figure 02d). Informal artisanal gold mining is particularly prevalent in this region. As a result, the soil ecosystem is disrupted and stripped of its sediments (Figure 2b), leading to the progressive degradation of rice paddies, which are becoming increasingly unusable (Figure 2c).

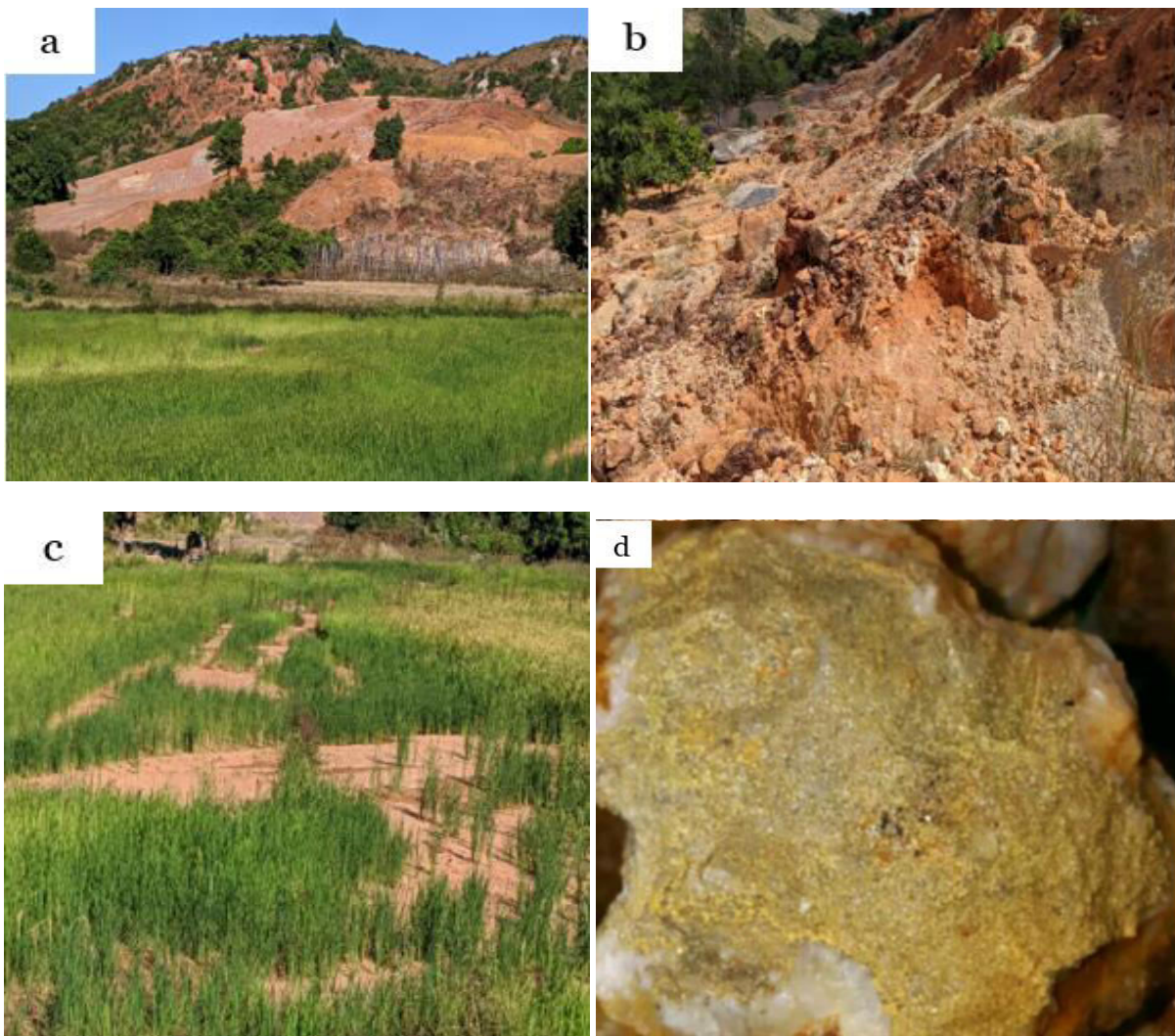


Fig 2: a) Juxtaposition of gold extraction at the top and rice field at the bottom, b) formation of lavakas and c) silting siltation of the rice field and d) Gold-bearing quartz vein.

The overlapping land-use rights of farmers for multiple purposes on the same plots of land generate latent land tenure conflicts. These involve sharecropping arrangements that extend across both agriculture and mining activities, with individuals relocating their work based on yield fluctuations. Consequently, artisanal gold extraction and local land tenure organization in Betsiaka are regulated by the DINA, a community-based agreement. It was officially recognized in 2013 and fully revised to comply with Law No. 2001-004 of October 27, 2017. The DINA provides temporary solutions to conflicts and facilitates access to mining activities.

Gold extraction has become a more significant source of income for the local population compared to agriculture. However, land resources are increasingly under pressure due to mining activities. Meanwhile, mineral resources provide employment opportunities and a means of subsistence for the entire community. It is noteworthy that 67.88% of the Betsiaka population are miners, while 32.2% are engaged in agriculture and livestock farming. Gold mining attracts a large number of individuals, both Malagasy and foreigners. Moreover, approximately 55% of Betsiaka's residents originate from other areas or regions; among them, 52.9% are involved in mining, and 2.1% engage in agricultural activities. Consequently, land governance is under considerable strain in the face of these competing land uses.

V. DISCUSSION

Mining activities in Madagascar are largely dominated by artisanal, small-scale, informal and often illegal operations [5]. Within this system, the actors involved in the artisanal gold mining value chain remain poorly identified. In Betsiaka, artisanal gold mining has become the primary activity and main source of income for the population, surpassing agriculture and livestock farming. Although small-scale mining serves both as a livelihood and a source of economic activity, its extraction methods contribute significantly to land degradation [5, 6]. Most of the extracted gold is smuggled and benefits only a few unidentified groups [7]. The volume and value of the gold extracted do not reflect the socioeconomic conditions of the local population [8]. As such, the existing governance system in Betsiaka fails to ensure the sound management of mining activities.

Consequently, integrating land governance with artisanal gold mining presents several organizational, environmental, economic, social, legal, and political challenges. Gold extraction in the area directly threatens farmers' food security. Good governance of natural resources one that respects the livelihoods of all rural populations is highly desired [9]. Therefore, the delineation of mining zones from agricultural areas is proposed as a way to reconcile rural activities in Betsiaka.

A lack of clarity regarding land ownership and usage rights often leads to conflicts. Mining laws must be reconciled with customary land tenure and community occupation rights [10]. Locally recognized customary rights may conflict with mining permits or licenses granted by state authorities. Adopting more responsible and sustainable mining practices would foster better coexistence between rural livelihoods and mining activities. The active involvement of all stakeholders local authorities, traditional leaders, elders, and representatives of farming communities in land governance and gold extraction activities is crucial for fostering acceptance and adaptation to land-use changes [11, 12]. In the case of Betsiaka, strengthening and restructuring the DINA remains essential.

VI. CONCLUSION

Reconciling land governance with rural activities in the Betsiaka gold-bearing area requires an integrated approach. This includes training local authorities and communities in land management and responsible mining practices, supporting agricultural and artisanal activities to reduce dependency on gold, and adopting specific legal and regulatory frameworks for land management in gold-mining zones to facilitate the formalization of mining operations. Collaboration among the Ministries of Environment, Mining, Agriculture, and local governments is essential to protect community land rights and to promote sustainable mining practices. Such an approach would help reduce conflicts and ensure a more equitable and sustainable development.

The distribution of gold wealth in the Betsiaka region remains ambiguous and unequal. The current system of land and natural resource governance exhibits significant shortcomings in balancing economic, environmental, and social dimensions. Its effectiveness is limited, particularly in managing small-scale operators. The existing monitoring

mechanisms are insufficient to enforce compliance with regulations. As a result, natural resources risk being depleted without contributing meaningfully to local development, and other rural livelihoods may vanish alongside the exhaustion of gold resources. Therefore, it is crucial to strengthen collaboration among local authorities, communities, and private actors to ensure sustainable land management. Establishing regulatory mechanisms is also necessary to prevent abuses associated with informal mining activities.

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