

# Warrantage - Opportunity to finance Agro-Forestry-Pastoral Activities on the Ruzizi Plain in the Province of South-Kivu in Democratic Republic of Congo

Nyamugali Thema Bonaventure<sup>1</sup> ; Sadiki Muhigirwa Jonathan<sup>2</sup> ;  
Et Nahano Kalembire Hérítier<sup>3</sup>

Universite Libre D'Uvira et des Grands Lacs, ULUGL/Uvira

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**Abstract:** This study highlights the nature and specificities of these activities, while identifying the constraints faced by smallholder farmers, livestock breeders, and traders in accessing finance. The objective of this study is to provide a comparative overview of agro-forestry-pastoral policies and economic models in force in the Ruzizi Plain in the Democratic Republic of Congo and in rural areas of the Republic of Burundi, highlighting the crucial role of financial institutions, such as banks, microfinance institutions, and agricultural cooperatives. These institutions are vital for agricultural development and the effective implementation of the warrantage system. This study adopts a comparative method to better understand the differences and similarities between two neighboring rural realities. It allows us to assess the impact of an innovation (warrantage) in one context (Burundi) and to verify the feasibility of its implementation in another context (Ruzizi Plain, DRC). This research also aims to understand how the warrantage mechanism would influence agro-forestry-pastoral activities and the perceptions of farmers and herders regarding financial challenges in the Ruzizi Plain. It also aims to understand to what extent warrantage would improve the ability of farmers, herders, and traders to invest in agricultural activities. This is our research question. The overall hypothesis of our study is that warrantage has a significant impact on the financial and food security and productivity of farmers, herders, and traders by improving access to credit and strengthening the security of their activities.

**Keywords:** Warrantage, Food Security, Financial Institutions, Cooperatives, Agricultural Loans.

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## I. INTRODUCTION

In the Great Lakes countries (DRC, Rwanda, Burundi, and Uganda), the population faces major challenges related to the degradation of natural resources, climate change, and rural poverty, which are particularly pressing. These challenges threaten not only food security, but also the economic and social stability of the region. The regional context of the Great Lakes countries (Democratic Republic of Congo, Rwanda, Burundi, Uganda, Tanzania) is essential for understanding the dynamics of rural finance (Manirakiza, D, 2021).

This degradation of natural resources is the consequence of several complex factors combined and sometimes interdependent. These factors are summarized by

the population growth which is galloping rapidly in Africa as a whole and more particularly in the countries of the Great Lake, the armed and political conflicts which have affected the region for more than a decade and the effects of climate change which lead to deforestation, water and air pollution and the destruction of biodiversity. (Sugar, F. A. O, 2024)

The DR Congo, being rich in natural resources and biodiversity, would play the roles of essential pillars for food security, economic development and environmental sustainability; especially in rural areas where the majority of the population depends on agriculture, forestry and livestock. In response to these challenges, agro-silvo-pastoral activities (ASP) are emerging as an integrated approach that aims to maximize the use of natural resources while improving the resilience of production systems. (ZONGO, I, 2024)

In this context, the warrantage mechanism emerges as an effective solution to overcome the obstacles to access to credit encountered by small farmers, breeders and traders (Gouillat, E, 2014). To understand warrantage, it is essential to clearly define this mechanism, its principles, its history and its operation. (Marceau, G., & Ouellet, A. P, 2024)

This section discusses the economic and financial theories that support warrantage, including information asymmetry theory, which highlights information imbalances between borrowers and lenders; rural finance and agricultural credit theory, which highlights the sector's specificities; and institutional theory, which explores the role of institutions and governance in the effectiveness of agro-forestry-pastoral activities. This study highlights the nature and specificities of these activities, while identifying the constraints faced by small-scale agricultural producers, livestock breeders, and traders in accessing financing (Abdou, R, 2021). The agro-forestry-pastoral sector remains essential in the Great Lakes countries in addressing the multiple challenges related to the socio-economic development of the population living in rural areas; especially since it affects both livestock production and agriculture, considering the forest environment. This framework therefore encompasses an important set for the socio-economic succession of the rural world (Sugar, F. A. O, 2024) Indeed, agro-silvo-pastoral activities are carried out regularly and daily. However, the expected results do not seem to reflect the reality on the ground, and consequently the need of populations practicing this approach seems to persist in terms of socio-economic growth and income (ADJERAN, B. B., DJAGOUN, V. D., & YABI, J. A, 2023).

This is why the warrantage approach or/and system has been adopted by some African countries as an experiment and contribution of innovation in the agro-silvo-pastoral sector. In the Great Lakes countries, and more particularly in DR Congo and Burundi, some efforts have already been made in this framework, although some challenges remain. Generally, the advantages and impacts of Warrantage noted during our research in favor of the rural population are numerous (Brulé-Françoise, A., Faivre-Dupaigre, B., Fouquet, B., Tafforeau, M. J. N., Rozières, C., & Torre, C, 2016).

In particular, facilitating access to credit by using crops as collateral to overcome liquidity constraints in the respective environments, yield growth, financial and food security, increasing production by 20% to 30%, investment in agricultural inputs, increasing efforts in cultivation techniques for reassuring yields, and facilitating schooling for the children of farmers and herders. However, some improvements are more remarkable in Burundi, unlike in the DR Congo in the Ruzizi plain, where certain challenges remain to be addressed within the framework of warrantage. The security context, cultural and community perceptions play a negative role in the effectiveness of the application of the warrantage principle. The community, less aware, prefers to practice survival culture, with the prerogative of security, which remains volatile in the area. To make warrantage effective, mitigation measures are possible to address the identified challenges. In the Ruzizi Plain, a problem arises in the management of agricultural production: after the harvest,

peasant farmers should store, each season, part of their production (corn, rice, peanuts, cassava, etc.) in a secure warehouse, and this stored part should be managed by an agricultural cooperative or a partner organization (NGO, microfinance). An agent or a technical structure will assess the quantity and quality of the stock, and would issue a receipt (the "warrant") which would serve as a guarantee (Naidoo, I. A., Mc Grenra, D., & Lomena-Gelis, M, 2021).

With this receipt, the farmer could obtain a loan (often short-term, between 3 and 6 months) from a microfinance institution, agricultural cooperative, or partner bank. The credit would generally represent 60 to 80% of the market value of the inventory. This would allow the farmer to repay his loan and recover his inventory when market prices are more favorable, it would also allow him to sell his harvest more effectively and earn a higher income. The advantages of warrantage in this process would be to avoid rushed sales at low prices right after the harvest, improve access to agricultural credit without land security, encourage savings and planning for future activities and growth, and strengthen the organizational capacities of farmers. Unfortunately, the peasant farmers of the Ruzizi Plain do not organize themselves in this way, which could be useful for their development. In this context, the role of warrantage is discussed, illustrating how this mechanism can be integrated into agricultural financial policies to promote the empowerment of agricultural producers, livestock breeders, and traders in order to strengthen their economic resilience (Manirakiza, D, 2021). The objective of this study is to provide a comparative overview of agro-sylvo-pastoral policies and economic models in force in the Ruzizi Plain in the Democratic Republic of Congo and in rural areas of the Republic of Burundi, highlighting the crucial role of financial institutions, such as banks, microfinance institutions, and agricultural cooperatives. These institutions are vital for agricultural development and the effective implementation of warrantage.

This article also aims to establish a solid foundation for a thorough understanding of warrantage and its role in financing agro-sylvo-pastoral activities, while taking into account the contextual specificities and challenges encountered in the study settings. This research also aims to understand how the warrantage mechanism would influence agro-sylvo-pastoral activities and the perception of farmers and herders regarding financial challenges in the Ruzizi Plain. But also to what extent would warrantage improve the ability of farmers, herders, and traders to invest in agricultural activities? This is our research question. The overall hypothesis of our study would be that warrantage has a significant effect on the financial, food, and productivity security of farmers, herders, and traders by improving access to credit and strengthening the security of their activities. This study will examine the warrantage mechanism as a solution to the financing challenges faced by agro-sylvo-pastoral farmers and breeders in the Ruzizi Plain, to assess the impact of warrantage on the financial-food security and productivity of farmers and breeders, in particular by answering the question of our problem posed.

## II. METHODOLOGICAL APPROACHES

This study adopts a comparative method to better understand the differences and similarities between two neighboring rural realities. It assesses the impact of an innovation (warrantage) in one context (Burundi) and verifies the feasibility of its implementation in another (Ruzizi Plain, DRC). The Ruzizi Plain and the provinces of Bubanza and Kayanza are all agricultural areas with high potential, but where rural development dynamics diverge. Burundi has adopted economic inclusion strategies such as warrantage, unlike the DRC in the Ruzizi Plain. The study targets agricultural producers, members of local associations, NGO leaders, and administrative authorities. The sample will be stratified and random, with a quota per type of stakeholder. Semi-structured interviews to gather stakeholders' perceptions, experiences, and suggestions were used in the field in both study areas. Direct observation of agricultural activities, storage, and community infrastructure, accompanied by documentary analyses of ADISCO reports and archives, and agricultural policies in both countries. Qualitative data are processed using thematic analysis. A comparative matrix will facilitate the interpretation of the results. Logistical constraints, language barriers, and the availability of stakeholders may have limited the scope of the study. However, the planned participatory approach aimed to minimize the effects. All respondents are informed of the study's objective. Free and informed consent is required prior to any data collection.

To conduct this research, semi-indirect interviews were conducted with a stratified sample of 10 agro-forestry-pastoral farmer and livestock farmer cooperative members, selected to represent diverse crop and livestock production in different geographical areas. These interviews provided an in-depth exploration of the farmers' and livestock farmers' experiences, their perceptions of the warrantage system, and the obstacles encountered in its implementation. To conduct this research, a random sample of 300 farmers and livestock farmers was conducted. Information was collected using structured questionnaires, which included questions on income, access to credit, and production costs. The results were analyzed using descriptive and inferential statistical methods to assess the relationships between the use of warrantage and indicators of financial security, food security, and productivity.

This study specifically examines the impact of the warrantage mechanism on access to credit, financial and food security, and the productivity of agro-sylvo-pastoral farmers and herders in the Great Lakes countries. Warrantage, which allows farmers and herders to use their harvests and livestock products as collateral to obtain credit, represents an innovative solution to financing challenges. Located in the eastern Democratic Republic of Congo (DRC), in the province of South Kivu, the Ruzizi Plain occupies a strategic position between the Mitumba mountain range on one side and the Ruzizi River on the other, which separates the DRC from Burundi and Rwanda. Over the past two decades, this part of the Uvira region has been the scene of surprising violence, following previous periods of crisis. According to

the authors, land disputes and land governance play a major role in conflicts over customary power in the Ruzizi Plain. Numerous studies describe the historical, socioeconomic, and political factors that underlie land disputes. The authors indicate that the Ruzizi Plain also experiences land tensions related to land use conflicts, particularly between farmers and herders. These conflicts are primarily related to livestock trampling and destroying agricultural fields. This is generally the case during the so-called small transhumance period, between April and August, when livestock move south of the plain to access greener pastures. However, even more fields are destroyed during the daily movements of livestock between kraals, pastures, and watering holes. Added to this are disputes over intended land use, which stem in part from the unclear boundaries between crop and grazing areas. Agropastoral conflicts in the plain have intensified since the Congo wars. With population growth, land grabbing by elites known as large farmers, who do not allow small farmers to flourish, and rampant insecurity, agriculture and livestock farming have become increasingly geographically close. Conflicts over land use have also intensified due to land expropriation and frequent population migrations, with temporarily abandoned land often used for livestock passage or as pasture. These conditions also do not favor warrantage in the Ruzizi plain.

The warrantage mechanism appears to be an essential lever for the development of Agro-Sylvo-Pastoral activities (Duffau, A., Lagandré, D., Chetaille, A., Rozenkopf, I., Horrédard, G., & Oggeri, B., 2011) in Burundi with the potential to transform the lives of farmers, livestock breeders and traders. However, for this system to reach its full potential in the Ruzizi plain in the DRC, it is crucial to declare the challenges identified and capitalize on the opportunities offered. By adopting a collaborative approach and raising awareness, it is possible to create an environment conducive to the emergence of a dynamic and sustainable agricultural sector, both in the Great Lakes countries and in Uvira, DR Congo. By integrating farmers, breeders and traders into the evaluation process, we not only increase the relevance and effectiveness of the initiatives, but also strengthen their commitment and autonomy (DE, S. E., & KI-ZERBO, J. O. S. E. P. H., 2017) This creates a collaborative environment where farmers, breeders and traders feel valued and invested in the success of the warrantage project in Uvira (DRC).

## III. PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

Preliminary results indicate that farmers and herders using the warrantage mechanism experience significant improvements in their financial and food security and better access to credit compared to those who do not. Furthermore, data suggests that warrantage encourages farmers and herders to invest in sustainable agro-silvo-pastoral practices, thereby contributing to increased productivity. This study demonstrates that warrantage is an effective lever for rural economic development. The results are being shared with stakeholders, including ADISCO, NGOs, ILDs, and the Congolese government, to promote wider adoption of this mechanism and initiate support programs to optimize its use.

These recommendations would also aim to encourage complementary socio-economic initiatives, to improve awareness and training of farmers and breeders, such as chicken farming, within self-promotion groups (Le Cotty, T., D' hôtel, É. M., Porgo, I., Subervie, J., & Soubeyran, R, 2023).

The results of our studies show that the impact of warrantage on the financial and food security of agro-sylvo-pastoral farmers and livestock breeders highlights several fundamental aspects. First, access to credit through the warrantage mechanism allows agro-sylvo-pastoral farmers and livestock breeders to overcome liquidity constraints. This offers them a valuable opportunity to invest in quality inputs, improve their crop and livestock farming techniques, and consequently increase their yields. Preliminary studies indicate that farmers and livestock breeders using warrantage see a 20 to 30% increase in their productivity compared to those who do not benefit from it. This improvement is particularly significant in the Ruzizi Plain in the DRC and Burundi. Furthermore, members who received credit through warrantage were able to send their children to school without experiencing financial difficulties. Our comparative exploratory analysis highlights marked differences in the effectiveness of warrantage between Burundi and the Uvira territory in the Democratic Republic of Congo (DRC). In Burundi, the use of warrantage has enabled farmers and herders to significantly improve their access to credit, with 70% of them reporting an increase in their borrowing capacity. This mechanism has also led to an average income increase of 25%, as well as an increase in agricultural productivity estimated at between 20 and 30%, thanks to facilitated investments in quality inputs. In contrast, in the Ruzizi Plain in the DRC, and specifically in the Uvira territory, only 2% of farmers and herders report having access to credit through similar mechanisms, a situation attributed to the weakness of local financial infrastructure (Manirakiza, D, 2021). The economic impact remains limited, with an average income increase of only 3%, often hampered by political, cultural, and economic instability. Furthermore, agricultural productivity is only increasing by 5%, due to unfavorable climatic conditions and limited access to agricultural inputs.

These results indicate that warrantage is significantly more effective in the Burundian context, where it benefits from stronger institutional support and greater awareness among farmers and herders, unlike in the Congolese context, where socioeconomic and financial challenges hamper its potential. To maximize the impact of warrantage in parts of both countries, it is necessary to adapt implementation strategies to local specificities, strengthening financial infrastructure and addressing the specific needs of each territory. The results of our study on the warrantage mechanism reveal significant impacts on access to credit, financial security, and productivity of agro-sylvo-pastoral farmers and herders in Burundi. Access to credit has improved, with 70% of farmers and herders reporting an increase in their borrowing capacity thanks to warrantage. This improvement has led to an average income increase of 25%, thus promoting greater financial and food security. Farmers and herders using warrantage have seen a 20 to 30%

increase in productivity, attributed to investments in quality inputs and improved cultivation techniques and livestock products. These results underscore the importance of warrantage as a lever for rural economic development, providing farmers and herders with the resources they need to optimize their agro-sylvo-pastoral practices. Despite the promising results of the warrantage mechanism in Burundi, its absence in Uvira in the Ruzizi Plain, a territory of the Democratic Republic of Congo, raises important questions. Despite the geographical proximity, contextual differences in infrastructure, agro-sylvo-pastoral practices, and cultural perceptions explain this divergence. This exploratory analysis examines the reasons for the total insufficiency of warrantage in the Ruzizi Plain (Uvira), DR Congo, highlighting the specific challenges encountered by agro-sylvo-pastoral farmers and breeders in this area.

The socioeconomic context of the various aspects of the Ruzizi Plain in the Democratic Republic of Congo shows that this study area faces greater socioeconomic challenges than Burundi. The climate of insecurity and persistent conflicts have a direct impact on agriculture, making farmers and herders reluctant to engage in financial systems such as warrantage. Farmers and herders, often in a survival situation, favor short-term financing approaches over more complex mechanisms. The quality of infrastructure is often inferior to that of some areas in Burundi. The lack of passable roads and the inadequacy of the fundamental principles of warrantage: loan security, reduction of information asymmetry, inventory valuation, asset stability, improvement of access to finance, facilitation of access to credit, financial inclusion, capacity building, financial flexibility, protection against losses, and the expectation of adequate favorable prices complicate the implementation of warrantage (ERGUIBI, H., & SADIK, A, 2022). Without reliable facilities for storing crops, farmers and herders are less likely to adopt a system where their products must be stored to guarantee credit and avoid bottlenecks. Storage, packaging, and livestock conditions in the Uvira region are often precarious, increasing the risk of post-harvest losses. Farmers and herders in Uvira, aware of these losses, are reluctant to use their crops as collateral, thus limiting the adoption of warrantage. Market access difficulties mean that farmers and herders in Uvira suffer from limited access due to economic and political instability. This uncertainty makes marketing their products difficult and unreliable, which discourages the use of warrantage (Eriola, J. A., Agbovoedo, J., & Hounkou, E. C, 2023). The inability to sell their crops on time compromises their ability to repay loans. Unlike in Burundi, where efforts have been made to educate farmers and herders about the warrantage mechanism, there are few similar initiatives in Uvira. The complete lack of information programs limits understanding of the benefits associated with this system, leaving producers ignorant and distrustful. In some cultures in Uvira, borrowing is perceived as a risk or a form of dependency. This perception reinforces a reluctance to adopt formal financing mechanisms such as warrantage, which require a long-term commitment. The complete inadequacy of warrantage in Uvira represents a missed opportunity for Afro-sylvo-pastoral development, which could contribute positively to development based on several aspects, including: -provide



access to credit; as warrantage helps farmers and herders diversify their crops and improve their food security; -farmers and herders could be encouraged to invest in sustainable agro-forestry-pastoral techniques, thus reducing their vulnerability to environmental shocks. An integrated approach, involving all stakeholders, is essential to create an environment conducive to sustainable local development and improving the living conditions of rural populations (KAHILU, Y. K., & TSHIJK, J. L. T, 2022). For warrantage to be successfully implemented in the Ruzizi Plain, it is essential to work on improving infrastructure, educating farmers and herders on the benefits of the system, and promoting changes in cultural perceptions towards borrowing (Dia, A, 2022). This approach can potentially benefit from the advantages of warrantage, thus contributing to the sustainable and inclusive development of agro-forestry-pastoral activities (Issahou, I., Sodjinou, E., Tchigo, E., & Yabi, J, 2023) in the Ruzizi plain in the Uvira region of the DRC. Furthermore, advocacy for the restoration of security is a key element that can foster a positive business climate to facilitate the value chain and supply chain of warrantage products and services. Investing in a completely unstable context plays a negative role and would therefore not facilitate the effective implementation of the warrantage system (Beveridge, M., Dabbadie, L., Soto, D., Ross, L. G., Bueno, P. B., & Aguilar-Manjarrez, J, 2018). The post-conflict context of the Ruzizi Plain can facilitate the development of several tools to strengthen the applicability of this warrantage system. Warrantage implementation stakeholders can facilitate the exchange of experiences (Singh, C. D., Rao, K. V., Kumar, M., & Rajwade, Y. A., 2023) between the two communities (the Ruzizi Plain in DR Congo and members of the Burundi community who have already explored the benefits) in order to promote and explore the achievements of related activities. This exchange of experiences will therefore allow for a firsthand understanding of the different realities surrounding this financial system and to draw lessons learned on its strengths and mitigate its weaknesses.

#### IV. CONCLUSION

In our research, entitled "Warrantage - Opportunities for Financing Agro-sylvo-pastoral Activities. Comparative Studies of Rural Areas in Burundi and the Ruzizi Plain in South Kivu Province, DR Congo," the objective was to provide a comparative overview of agro-sylvo-pastoral policies and economic models in force in the Ruzizi Plain in the Democratic Republic of Congo and in rural areas of the Republic of Burundi, highlighting the crucial role of financial institutions, such as banks, microfinance institutions, and agricultural cooperatives. These institutions are vital for agricultural development and the effective implementation of warrantage. We began with the following research question: "To what extent would warrantage improve the ability of farmers, herders, and traders to invest in agricultural activities?" To address our objective, we addressed this issue. The results of our study on the warrantage mechanism reveal significant impacts on access to credit, financial security, and productivity of agro-sylvo-pastoral farmers and livestock producers in Burundi. Access to credit has improved, with 70% of farmers and livestock producers reporting an increase

in their borrowing capacity thanks to warrantage. This improvement has led to an average income increase of 25%, thus promoting greater financial and food security. Farmers and livestock producers using warrantage have seen a productivity increase of 20 to 30%, attributed to investments in quality inputs and improved cultivation techniques and livestock products. These results underscore the importance of warrantage as a lever for rural economic development, providing farmers and livestock producers with the resources they need to optimize their agro-sylvo-pastoral practices. Despite the promising results of the warrantage mechanism in Burundi, its absence in Uvira in the Ruzizi Plain, a territory of the Democratic Republic of Congo, raises important questions. Despite the geographical proximity, contextual differences in infrastructure, agro-sylvo-pastoral practices, and cultural perceptions explain this divergence. This exploratory analysis examines the reasons for the complete inadequacy of warrantage in the Ruzizi Plain (Uvira), DR Congo, by highlighting the specific challenges faced by agro-sylvo-pastoral farmers and herders in this area. Based on this finding, our hypothesis, "warrantage has a significant impact on the financial and food security and productivity of farmers, herders, and traders by improving access to credit and strengthening the security of their activities," was confirmed. This study being the work of man, it is undoubtedly with typos, hence we remain open to different criticisms and suggestions and recommend the study to other researchers who would like to follow suit under this theme or under other facets.

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