

Policy Brief

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October 2020

Endogenous Products to Increasing Food Security in Benin

Who is this aimed at?

- Agricultural policy makers in government and institutions
- Agri-businesses

Key messages

- The white KG with small grain size is highly accepted and strongly demanded in Benin.
- The production of KG is the main barrier to its market development.
- Farmers' decision to augment the quantity of their production of KG is based on an assessment of a combination of contract farming attributes.
- To be successful in implementing a contract farming on the production of KG, a contracting company needs either to be well-known by the farmers or to rely on a well-known procurement officer by farmers.

Policy options

- Traditional marketing system may be considered for market development for KG
- Institutional arrangements can help to increase the production of KG
- Satisfying farmers ultimate needs for producing KG may be a first milestone to insuring KG accessibility and affordability.

Executive Summary

Kersting groundnut (KG) is a crop used mostly in feasts and big events and known as Doyiwé in Benin that has been neglected because of a lack of incentive, policy and research support for its production. Production and marketing systems for the crop seem to be fragmented as there are many varieties of the grains being cultivated. To bring out the full potential of KG in increasing food security in Benin, two subsequent studies have been conducted in the work package on marketing systems in the project Doyiwé.

The first study qualitatively deepens our understanding of the variation in preferences and uses of KG of farmers, processors, traders, and consumer groups. This study was conducted from March to April 2018 and relied on personal interviews with 21 actors of the value-chain of KG and 7 agricultural experts. The second study, quantitatively designs institutional arrangements that can contribute to enhance the production of KG which appears from the first study, to be the main limitation for further market development for KG. The study on the contract farming attributes for KG supply was conducted from June to July 2019

and was based on a quasi-experiment with 254 farmers in KG growing basin (Central region of Benin). The contract attributes for the supply of KG are pre-production agreements between the farmer and the eventual buyer to reduce uncertainties and costs related to farm input, output market and quality of KG.

While the personal interviews provided insights into how to bring out the full potential of KG for consumers, processors and farmers, the quasi-experiment enlightens the contract farming attributes that entice the most farmers to increase their production of KG. The key findings presented in this brief are aimed at guiding agri-businesses, institutions and policy makers in food policy and the promotion of endogenous products.

Why it is important to enhance the production and the marketability of KG?

Kersting groundnut (KG) as any African endogenous product, stems from the natural, socio-cultural and economic systems within Africa (Ingenbleek, 2019). It is a neglected and underutilized food product, and has been maintained for its

cultural and traditional value (Dansi et al., 2012; Gruère, Nagarajan, & King, 2009). KG, therefore, not only increases consumers' quality of life as it diversifies diets, but it may also help to improve food security because it provides vital nutrients (Manap, 2015). Because the crop draws on Africa's rich diversity of natural resources (Meredith, 2014) it can

constitute a source of sustainable competitive advantage for African firms (Ingenbleek, 2019) and can play a crucial role in the income generation of small-scale farmers in Africa (Dansi et al., 2012). By enlarging the demand for KG, Africa's heritage is therefore leveraged to help shape its future.

How do we proceed to understand the process of enhancing the production and the marketing of KG?

We conducted a qualitative study to understand the market potential and preference for KG and a quasi-experiment aiming at understanding which contract designs are likely to motivate farmers to enhance the production of KG in Benin. As for the qualitative study, we designed multiple-case studies to identify context-specific market and supply development instruments for KG in Benin (Yin, 2013).

We used three regions of Benin as case studies representing respectively an urban market, a rural market, and a production zone. We conducted interviews by using a semi-structured interview guide, based on the 4As-framework (accessibility, affordability, acceptability, and awareness) (Sheth & Sisodia, 2012). Twenty-eight qualitative interviews, with 21 actors of

the value-chain of KG and 7 agricultural experts served as primary data sources of information. Additionally, observations were recorded in notebooks to help triangulate the evidence and to allow the contribution of emergent questions and unique case features (Eisenhardt, 1989).

For the quasi-experiment, we present respondents with hypothetical scenarios that vary in terms of contract farming attributes (e.g., e.g., Adekambi, Ingenbleek, & Van Trijp, 2018). The attributes of the contracts were selected from a list of contract attributes obtained from the literature (see Table 1). The list was also discussed with two agricultural experts for contextualization and fit with KG farming. Respondents thus indicated for each scenario the quantity of KG in kilograms that they intended to produce given the (hypothetical) contract that was shown to them.

Table 1: Contract Farming Attributes, their Functions and Levels

Functions of the Contract Farming	Contract Farming Attributes	Attributes Levels
Reduces Output Market Uncertainties	Price options	Fixed price negotiated in the beginning of the production season
		Variable price, depending on the market at post-harvest time
	Delivery payment methods	Cash payment at delivery
		Prepaid deposit in the beginning of the production season
Reduces Input and Quality Uncertainties	Access to certified seeds	Provided by a well-known contractor company
		Provided by an unknown contractor company
	Access to post-harvest facilities	Provided by a well-known contractor company
		Provided by farmers themselves

What do we find?

The interviews show that the white KG with small grain size is the highly accepted and strongly demanded variety of KG by consumers, processors and traders in Benin. In addition, cultural heterogeneity and different levels of economic development of regions in Benin cause the occurrence of various fragmented markets on different development stages. Whereas, the south of Benin is an existing market of KG, where KG is considered as a commodity, the North of Benin is an emerging market of KG where the crop is demanded and an integral part of important festivities in urban areas. The study comes up with a market development model for KG stylized in a five-stage model (Figure 1). In the first stage, the market potential of KG is evaluated by identifying untapped markets that can potentially be reached through the trading system. KG is, for example, produced in the Central region of Benin, transported to the markets in the South, from where it is often brought by traders to the North, and is potentially distributed further in surrounding areas. In the second stage, the accessibility of KG is ensured, by increasing the supply of endogenous products to 'fill up' the trading system to fulfill the demand in urban areas in the South of Benin. In the third stage, the affordability of

KG is increased because the increased supply allows traders to purchase larger quantities, and thereby, reduces their distribution costs. In the fourth stage, traders start creating awareness for KG on new market space in peri-urban areas and urban areas in neighboring countries. To increase awareness of consumers, social networks and people with central- and leading roles in such networks as traders and processors may be involved to spread product knowledge through words-of-mouth. In the last stage, the acceptability of KG is achieved on the market in rural areas of which the market potential is assessed by identifying suitable target consumers and available marketing channels. This can be achieved by engaging traders and other stakeholders in rural markets and by adapting to cultural differences. As such, depending on the stage, one "A" gets more emphasis than the others.

Furthermore, the interviews revealed that the strong market demand and cultural value of the crop motivate producers in the production zone in the center of Benin, to cultivate KG. However, due to the sensitivity of KG towards climate change and the fluctuating quality of available sowing material, the cost of field preparation, land demand, available labor force, and complex harvesting, the supply of KG cannot be taken for granted.

Thus, the production of KG is perceived as risky by farmers.

Building on these results indicating that the supply of KG is the main barrier to its market development, the quantitative study identifies the contract attributes that entice farmers to increase their production of KG. The interviewed farmers preferred the attribute - variable price depending on the market for price options (62.20% of them) to the attribute fixed price negotiated in the beginning of the production season (37.80%). Most of the

KG farmers in the study area have strong preference for prepaid deposit as the delivery payment method (79.90% versus 20.10% for the attribute cash payment at delivery). As for access to certified seeds, many farmers of KG preferred to receive certified seeds from a well-known contractor company (70.10% against 29.90% for certified seeds being provided by an unknown organization). Most of KG farmers preferred the post-harvest facilities provided by a well-known contractor company (about 59.80% of them) to those provided by an unknown contractor company (21.30%) or by farmers themselves (18.90%).

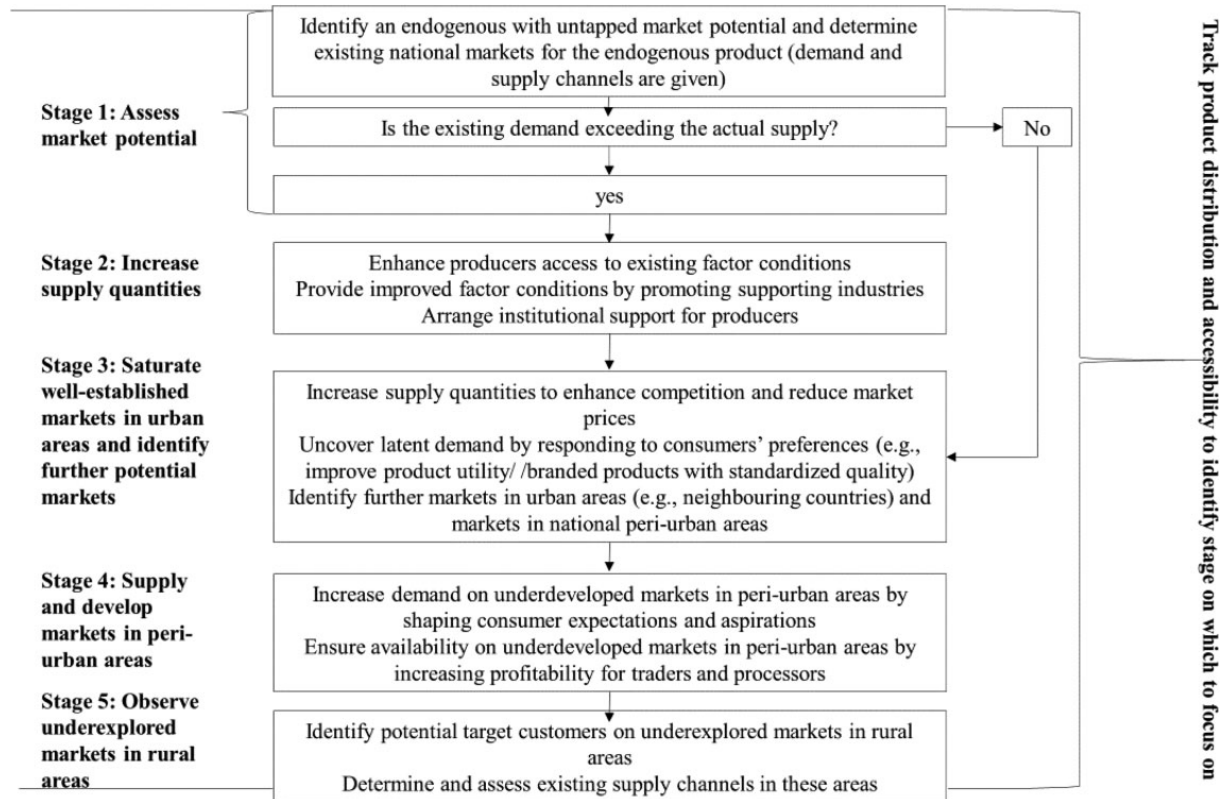


Figure 1: Model for Market Development for Kersting Groundnut (KG)

The results of the quasi-experiment further revealed five clusters of farmers (see Table 2) that have the preference of the production through prepaid deposits as common need and other specific needs depending on the localities they are living. The discriminatory analysis on the different contract attributes unveils that the first cluster was made of farmers of KG (25.79%), the majority of whom had preference for fixed prices and preferred to receive certified seeds from a well-known contractor company. These farmers mainly live in the municipalities of Glazoué (Hoko), Kétou (Igbo-Iloukan), Zogbodomey (Zoungbo Zounme) and Agbangnizoun (Gbindoume). The average intended production of KG for this cluster was estimated to be 224.274 Kg per farmer, meaning an expected increase of 60.55% of their production of KG. The second cluster, being the largest one (31.89%) was made of KG farmers who mainly care for the quality of the seeds. They want to access certified seeds from a well-known contractor company and can be found in the municipalities of Djidja (Kpoteta) and Bohicon

(Djohounta). The average intended production of KG for this cluster was estimated to be 199.290 Kg per farmer, indicating an expected increase of 54.07% of their production of KG. The third cluster (18.21%) is made of farmers that need to be ensured about the output price. Thus, they prefer the fixed price attribute as price option for a total estimated intended production of KG of 187.808 Kg per farmer, suggesting an expected increase of 79.96% of their production of KG. These farmers live in the municipalities of Ouessè (Vossa), Glazoué (Assante), Zogbodomey (Atchia), and Agbangnizoun (Agbidime). The most preferred contract attribute of the farmers in the fourth cluster (18.11%) is the access to post-harvest facilities by a well-known contractor company to conserve their production by keeping it dry and prevent contamination. The average intended production of KG for this cluster was estimated to be 196.778 Kg per farmer, signifying an expected increase of 59.62% of their production of KG. Farmers of the cluster 4 live in the municipality of Zakpota (Kodota). The last cluster, the

smallest one (6%) is made of farmers that only care for the conservation of their produce no matter the provider of the post-harvest facilities. These farmers live in the municipality of Agbangnizoun (Fonli). The average intended production of KG for this cluster was the highest

and estimated to be 247.38 Kg per farmer, denoting an expected increase of 73.71% of their production of KG. The study provides recommendations for dealing with each cluster of farmers (see Table 2).

Table 2: Modelling Contract Farming Attributes for Farmers of KG

Farmers' common need	Prefinance of the production of KG through prepaid deposits at the beginning of the production season				
Farmers' specific needs depending on localities	Glazoué (Hoko) Kétou (Igbo-Iloukan) Zogbodomey (Zoungbo Zounme) Agbangnizoun (Gbindoume)	Djidja (Kpoteta) Bohicon (Djohounta)	Ouessè (Vossa) Glazoué (Assante) Zogbodomey (Atchia) Agbangnizoun (Agbidime)	Zakpota (Kodota)	Agbangnizoun (Fonli)
	Need to be ensured about the output price and the quality of the seeds	Mainly care for the quality of the seeds	Need to be ensured about the output price	Mainly care for keeping their harvest dry and prevent contamination using post-harvest facilities from a well-known company	Want to access post-harvest facilities no matter who provides them to conserve their production by keeping it dry and to prevent contamination
Recommendations	Set the output price with the farmers in the beginning of the production season Provide farmers with certified seeds from your company.	Provide farmers with certified seeds from your company.	Set the price of the output in the beginning of the production season in consultation with farmers.	Provide farmers with post-harvest facilities such as drying, conserving, and packing materials in the beginning of the production season as a guaranty of your company buying their production.	Provide farmers with post-harvest facilities to dry, conserve and pack their produce.
Expected increase of the production of KG	60.55%	54.07%	79.96%	59.62%	73.71%

What can Agri-businesses do to promote Kersting groundnut?

Benin's Agri-businesses can take onboard the following recommendation to develop the market for KG in a sustainable way:

- The markets for KG can be developed through endogenous marketing systems, because traders are familiar with the products and, once markets in easy-to-reach areas become saturated, they advocate their use in new market areas.
- Through this process, the market for KG potentially grow from urban to peri-urban and rural areas.
- KG can be seen as the outputs of endogenous businesses, as it uniquely grows in a particular ecological zone in Benin.
- Market development strategies for KG can build on informal actors such as traders who contribute to

creating awareness about the products, acceptance, and affordability by increasing access.

- Farmers needs to be approach with a combination of contract attributes because farmers' decision to augment the quantity of their production of KG is based on the assessment of the contract farming using a combination of attributes rather than on individual/isolated attributes.

What can governments and institutions do to support Kersting groundnut?

Benin's Governments can incorporate the recommendations in its agricultural policy framework, decisions / actions aiming at:

- Fostering awareness and promoting the consumption of KG

- b) Facilitating information and communication technologies to access, develop and utilize quality seeds of KG
- c) Promoting the development of policies for the production of KG.
- e) Support capacity building for the sustainable development of certified seeds of KG.
- f) Fostering strategic alliances for KG among research institutes, extensions agencies, agricultural associations, and agri-businesses.
- g) Boosting the development of a proficient supply chain for KG.
- h) Encourage research on improved varieties and transformation of KG.
- i) Enhancing the licensing of KG seeds produced with public funds.

Conclusion

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Acknowledgements

This issue brief was written as part of a postdoctoral research project at Wageningen University and Research supported under the Project Doyiwé, no. W 08.270.344. The Project Doyiwé is funded by the Netherlands Organization for Scientific Research (NWO/WOTRO) in Benin, within the framework of the Food & Business Applied Research Fund.

Kersting Groundnut is a product that has a strong potential for increasing food security in Benin because it is a highly demanded and well accepted crop that is rooted in Benin endogenous natural resource advantage and the economic, social and cultural systems that build on them. However, its production must be enhanced and its market well developed. The present policy brief provides a five-stage model through which the market for KG can be developed. To boost its production, farmers needs to be approached with a contract farming that fulfils their ultimate needs in terms of price options, payment methods, seeds quality and harvest conservation. While contract farming schemes for staple foods and export oriented agri-food are widely known and most investments therefore still go to these foods, KG may miss the momentum to obtain a permanent foothold in Benin's markets. Hence, KG deserve more attention in Benin's development agenda.

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Project Doyiwé

The Project Doyiwé, "Enhancing Kersting's Groundnut (*Macrotyloma Geocarpum*) Production and Marketability in Benin" seeks to contribute to the promotion of inclusive and sustainable growth in the agricultural sector by strengthening the KG value chain, improving farmers' incomes, processors' productivity, and consumers' food security. The project is funded by the Netherlands Organization for Scientific Research (NWO/WOTRO) of the Kingdom of the Netherlands within the framework of the Food & Business Applied Research Fund. Following a science-based value chain approach, the complementary expertise of consortium members, SOJAGNON, UAC/FSA-LEA, Benin-Bioiversity International, WUR/MCB, and BAIH-Sarl, seeks to co-create quality seeds of consumer-preferred KG varieties and enhance market linkages to boost KG's production and market value in Benin.

Please cite as

Babah Daouda, F., and Ingenbleek, P.T.M. 2020. *Endogenous Products to Increasing Food Security in Benin*. Project Doyiwé, issue brief No. 1. Wageningen University & Research.

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