

How Informal Value Chain Actors Nurture Indigenous Knowledge

A Case Study of Indigenous Vegetables in Tana River County, Kenya



WAGENINGEN
UNIVERSITY & RESEARCH

wur.eu

Colophon

Authors

Cynthia Onyangore¹, David Obiero² February 2024
Reviewed by: Thies Reemer³

¹ Trade Up Commodities Ltd, Eldoret, Kenya, ² Welhungerhilfe, Kenya,
³ Wageningen University and Research, Wageningen Centre for
Development Innovation, The Netherlands

Photography

David Obiero (cover, p4, p5, p6, p8, p9)
Naresh Kumar Nain, Thies Reemer, Dereje/Shutterstock.com,
David Obiero (back cover)

Design

Erika Endrődiné Benkő

This case study is part of the informal economies trajectory of
Wageningen University and Research together with alumni from
different countries in Africa, Asia and Latin America (KB-35 programme
2023–2024).

This report can be downloaded for free at <https://doi.org/10.18174/677432>

© 2024 Wageningen Centre for Development Innovation, part of the
Stichting Wageningen Research. P.O. Box 88, 6700 AB Wageningen,
The Netherlands. T+ 31 (0)317 48 68 00, E info.cdi@wur.nl, www.wur.eu/cdi.



Wageningen Centre for Development Innovation uses a Creative
Commons Attribution 4.0 (Netherlands) licence for its reports.

The user may copy, distribute and transmit the work and create
derivative works. Third-party material that has been used in the work
and to which intellectual property rights apply may not be used
without prior permission of the third party concerned. The user must
specify the name as stated by the author or licence holder of the work,
but not in such a way as to give the impression that the work of the
user or the way in which the work has been used are being endorsed.
The user may not use this work for commercial purposes.

The Wageningen Centre for Development Innovation accepts no
liability for any damage arising from the use of the results of this
research or the application of the recommendations.

Report WCDI-24-382

Indigenous vegetables are making a comeback in Kenya. While they have previously been regarded as 'poor man's food', the cultural significance and health benefits of indigenous vegetables are now increasingly valued in Kenya. In the chain from production to consumption, informal actors, who are predominantly women, ensure that the perishable indigenous vegetables reach their various markets. Through producing the vegetables, they make a contribution to agrobiodiversity. And they play a role in preserving cultural and indigenous knowledge. However, they are often considered 'backward' by decision- and policy-makers, and most value chain interventions focus on formal actors, and formalization. Recognition of the positive roles of informal actors and cataloguing indigenous knowledge could stimulate the comeback further. Enhancing the decision-making power of women and using a multi-stakeholder approach are essential to expand on the positive contributions of women in this part of Kenya's food system.

The context

Smallholder farmers in Kenya produce a wide range of African indigenous vegetables as part of a long tradition. The areas of production and the role in the country's total GDP are estimated to be very low.

In Kenya's Horticulture Sector, vegetables account for 44.6% of the production, fruits account for 29.6%, flowers account for 2.3%, and nuts, aromatics and medicinal plants account for the remainder. It has not been clearly estimated what percentage African Indigenous Vegetables (AIVs) contribute. Previous studies show that indigenous vegetables¹ constituted about 3.7% of all vegetables consumed (KARI 2013).

However, a steady improvement in the demand for indigenous vegetables has been seen in both local- and international markets (see Abel et al., 2019 and Bokelmann et al., 2022). Could this signify a comeback?

While it has not been addressed in the past, efforts have been stepped up to improve and support the sub-sector. Kenya's Vision 2030² prioritizes intensive production and commercialisation of horticulture crops, including indigenous vegetables. Also, the Global Alliance for Improved Nutrition (GAIN) Vegetables for All initiative (VfA)³ targets improving dietary diversity for urban and peri-urban populations in Kenya. Hence, the country's Vision 2030 Agriculture Sector Development Strategy (ASDS) and Bottom-Up Economic Transformation Agenda (BETA) envisage the need to accelerate the development of African leafy vegetable and fruit production and clearly specify positive development of these sub-sectors from subsistence level to commercial and market-oriented agriculture (GAIN 2022).

Indigenous vegetables were previously regarded in Kenya as a 'poor man's food'. However, with the number of middle- and high-income earners rising in the country and nutritional education spreading, there is a steady increase in demand for indigenous vegetables. Leafy green vegetables are packed with vitamins, minerals, and fibres, yet, low in calories. Eating a diet rich in leafy green vegetables can provide numerous health benefits including reduced risk of obesity, heart disease, and high blood pressure.

Diversity in maternal diet has been associated with significantly lower rates of malnutrition in children across counties. There is an increasing acceptance that diverse diets including leafy vegetables rich in micro-nutrients are essential for addressing the burden of malnutrition that many face in Kenya. About 200 indigenous plant species are utilized as leafy vegetables in the country. Only four have been fully domesticated and 15 semi-domesticated, while most of the species are wild (Maundu, 2018).

Did you know?

- Vegetable production in Kenya increased from 347,000 tons in 1972, to 3.34 million tons in 2021.
- Kenya's Horticulture Sector: 45% vegetables, 30% fruits, 2.3% flowers. Remaining: nuts, aromatic and medicinal plants.
- Indigenous vegetables: around 3.7% of all green consumed*

* KARI 2013

1 In other studies, referred to as 'African Indigenous Vegetables' (AIV).

2 <https://vision2030.go.ke/>

3 Vegetables for All was launched in 2023 in Kenya, by GAIN in collaboration with the Kenyan Ministry of Agriculture. The "Food Fiti" campaign in urban and rural areas aims to promote vegetable consumption.

Informal actors in the indigenous vegetables value chain

Informal actors play a significant role in the indigenous vegetables value chain in Kenya, contributing in various ways to the local economy, culture, and social structures. As illustrated in the Actor Map (Figure 2), some key actors include:

1. Smallholder Farmers: These are the primary producers who cultivate traditional crops and vegetables using traditional agricultural practices that preserve indigenous biodiversity. They are mainly women. Their operation is largely subsistence, and they constitute more than 80% of the production force. The land is mostly owned by men, who are also considered the custodians of community land. Men, therefore, largely determine the extent to which women are involved in the commercialization of the indigenous vegetable value chains.



Figure 1: Spider plant farmer in Wenje Tana River County.

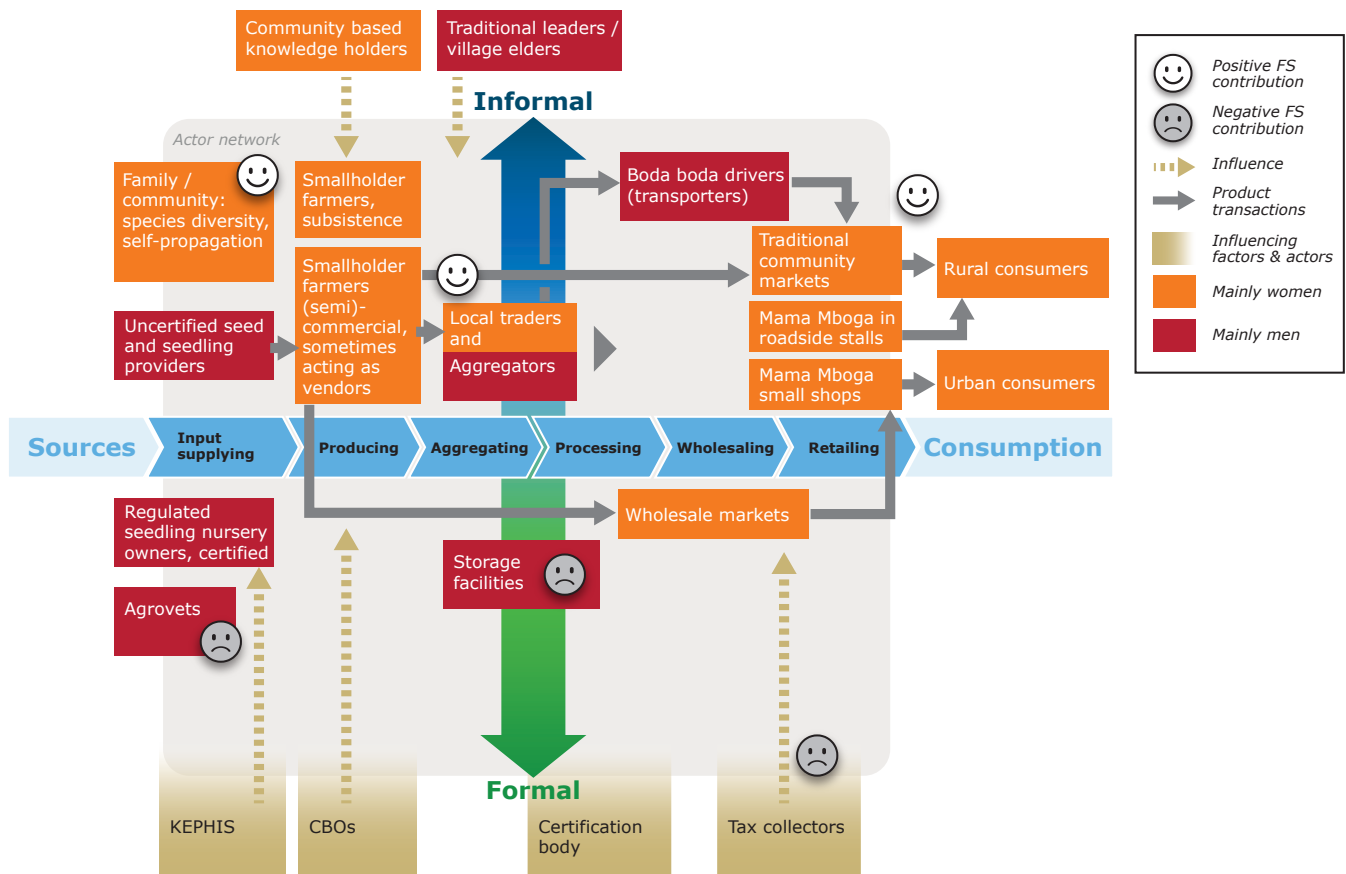


Figure 2: Informal-formal actor mapping for indigenous vegetables value chain based on Tana River County.

2. Local Traders and Aggregators: These actors purchase directly from farmers. They often operate in local markets, buy indigenous crops and vegetables in bulk and redistribute them within the community. Typically, indigenous foods are traded at farm gates, without formal measurements. Vegetables may be bartered for grain, seeds, payment of services, or payment of school fees for their children.

3. Transporters: These are young men who use 'boda-boda' (motorcycle taxis, which can access areas that other vehicles cannot reach) to transport vegetables from the farm gate to local markets and urban centres. They handle vegetables in market areas, broker them upmarket and deliver them to customers. Sometimes, they are also involved in the trade itself. No standard fees apply. They are very flexible in their operations. Their tasks and fees are agreed mutually without formal receipts.

4. Market Vendors and Small-Scale Retailers are otherwise known as: '**Mama Mboga**'. They sell indigenous foods and vegetables in local markets, roadside stalls, and small shops. They have direct interactions with consumers and play a crucial role in making indigenous produce accessible to local communities. *Mama Mboga* operations are versatile; some will produce and then sell their own vegetables by the roadsides or in market stalls, and some have small shops and/or stalls and will rely on supply from different producers or local traders / aggregators and some will get their produce from wholesale markets and then repackage and retail using the previously referenced channels.

5. Traditional and Community Markets: These are most frequently organised periodically in rural areas and serve as hubs for the exchange of indigenous foods. These markets provide a platform for farmers, traders, and consumers to engage in local, community-based transactions.

6. Community-Based Organisations (CBOs): The CBOs work closely with farmers and communities to provide support, training, and resources. They often facilitate collective marketing efforts that enable farmers to sell their produce collectively and negotiate better prices within the informal market.

7. Seed and Seedling Providers: These can be informal but are regulated. Individuals within communities who specialise in preserving and sharing indigenous seeds and seedlings play a vital role. They ensure the availability of diverse and traditional crop varieties, contributing to the sustainability of indigenous food chains. Seedling providers are either certified or uncertified by Kenya's Plant Health Inspectorate Service (KEPHIS). Uncertified seedling providers may also be producers and retailers of the vegetables produced.

8. Agrovets: In Tana River County, most agrochemical shops that sell vegetable seeds, insecticides, herbicides, and fungicides are run by men. Women are at a disadvantage in accessing knowledge. Most capacity-building initiatives by civil society organisations in Agriculture and even the Government departments are mainly attended by men, as women are expected to assume household roles. A number of the men attending these trainings are motivated by allowances provided by the training organisers, as opposed to gaining practical knowledge on crop agronomy or marketing.

9. Storage facilities for perishable goods/food items are controlled by men and only a few women are allowed to participate in the pricing of vegetables.



Figure 3: Vegetable trader in Tana River county offloading products at the local market.



Figure 4: John Kilonzo, vegetable trader, Tana River County, Kenya.

10 Local Consumers from households, restaurants, and community institutions, are key players. Their demand for indigenous foods drives the informal market. They often prefer these foods for their nutritional value, taste, and cultural significance. For example, the slightly bitter taste of indigenous vegetables is often referred to as a quality indicator, and according to consumers the 'improved' vegetables lack taste.

11 Traditional Leaders and Elders: Traditional leaders and elders influence agricultural practices and food choices within indigenous communities. Their knowledge and guidance shape farming techniques, seed selection, and the conservation of traditional food culture. These leaders largely act as gate keepers on the production and marketing processes of indigenous vegetables within the community.

12 Community-Based Traditional Knowledge Holders: These are individuals within communities who possess traditional knowledge about indigenous crops, their uses, and cultivation techniques and they are essential players. They often pass down their knowledge verbally, preserving the heritage of indigenous foods. They are mostly elderly women who are custodians of knowledge about preservation techniques, such as fermentation, seed extraction and preservation, and tacitly hold production knowledge on the indigenous vegetables.



Figure 5: Roadside market stalls.



Figure 6: Indigenous vegetables displayed in a market in Tana River County, Kenya

The Actor Map shows that some actors are both in the formal and informal spectrum e.g. there are regulated seedling nurseries and also unregulated seedling nurseries that supply seedlings to farmers.

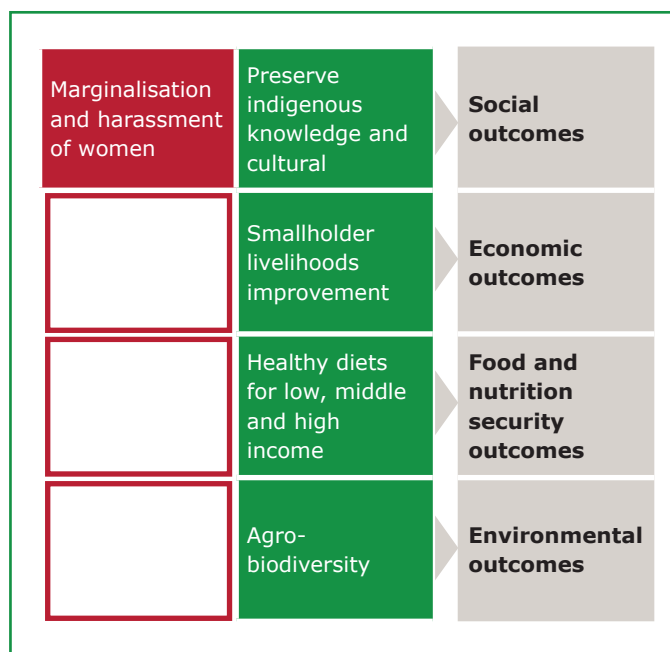
Some aggregators and traders have some formal organisations in markets, with most, however, not belonging to any associations. Leadership is also both formal, as with Chiefs who are appointed by the Government, as well as informal e.g. village elders within the local community. Whereas the value chain is considered a 'women's chain', the role and dominance of men is found at critical nodes, including productive resources, such as the land, part of the input supply and the transportation and aggregation. The map also shows the perishability of the product: the levels of brokering are limited and the value chain is relatively short.

Contribution to food system outcomes

The network of actors outlined above generally contribute positively to social, economic, food and nutritional security and environmental outcomes. Firstly, through contribution to **healthy diets**, by making available a source of essential dietary vitamins and minerals to low-, middle- and high-income consumers. This leads to improved human health and strengthened resistance against diseases. Indigenous vegetables are perceived as providing more micronutrients compared to conventional vegetables, which is beneficial for example for lactating mothers.

In terms of **social outcomes**, the actors are essential for preserving cultural values, indigenous knowledge and heritage. Some of the actors are indigenous knowledge holders who pass on to others how to collect, preserve, multiply, produce, process, and use indigenous vegetables. There is the growing awareness on the need to preserve indigenous knowledge.

In terms of **environmental outcomes**, the actors contribute to sustainable food production and climate smart adaptation. Since indigenous vegetables are grown in their natural habitats, diversified agricultural production system are required. It offers opportunities to strengthen both natural and socio-economic systems. Due to the informal nature of the value chain, it offers many opportunities for smallholder livelihood improvement, contributing to better **economic outcomes**.



What if?

The indigenous vegetables value chain depends completely on informal actors, and informal relationships between actors handling the vegetables, as well as those who are supporting it with indigenous knowledge. The informality offers opportunities for women. What if the value chain was regulated? Women in Tana River County, and generally, in Kenya, are commonly thought of as contributors of labour, while men are often perceived as decision-makers on investments and income as the *'Head of the Household'*. Indigenous vegetables are not considered a high-value cash crop.

Although regulating and formalising the value chain could have a positive effect on the quality of vegetables, it could mean that many small-scale producers involved (both in seeds/seedlings and the vegetable products) would not be able to access the markets or would rely only on selling and bartering with neighbours. Likewise, *boda-boda* transporters and informal sellers would lose their small business, as the transaction costs would increase beyond their abilities. Indigenous knowledge would slowly fade away if the market becomes dominated by larger scale (male dominated) formal businesses. It may also mean that the diversity of crops goes down to make production more efficient, affecting agro-biodiversity.

What if the informal actors were supported in other ways? For example, what would occur if indigenous production, seed propagation and preservation techniques were catalogued and made available to more actors in the value chain? Could this lead to mainstreaming of traditional knowledge while keeping informal actors involved?

What if the demand for indigenous vegetables could be further promoted? Would only middle- and high-income earners benefit from this? Or would it also improve access for low-income earners and inspire them to find affordable ways to enrich their diets? Would there be a trade-off for environmental outcomes, or do indigenous vegetables provide the perfect balance between protecting biodiversity and natural resources while producing enough nutritious food (Gotor and Irungu, 2010; Ebert, 2014)?



Figure 7: African Black Nightshade (*Managu*) Farm.



Figure 8: African Nightshade seedlings and vegetables ready for market.

Challenges and opportunities

The roles of informal actors in preserving traditional knowledge, maintaining crop diversity, fostering cultural heritage, empowering local communities, and promoting sustainable agricultural practices are often not recognised. They may be dismissed as marginal, or even considered as 'backward'⁴. However, their various functions are interlinked and ensure the workings of this value chain.

On the other hand, there is little or no coordinated efforts in the chain, as it is characterised by non-standardisation of produce, competition, lack of collaboration, and mistrust among the stakeholders. This usually leads to information asymmetry and high transaction costs.

A gender lens shows advantages and disadvantages of informality in this chain. The informality allows many women to benefit from the chain in a male-dominated society and paternalistic wider context. At the same time, informality creates a fertile ground for further marginalization of women. For example, harassment cases experienced by *Mama Mboga* at their selling points, poor working conditions and exploitation of women as they sometimes desperately seek to control some income to take care of their families.

For a sector that is largely informal and unregulated, it exhibits great potential for growth. Tana River County adopted small scale irrigation and serves as a hub and supplier of indigenous vegetables to the drier neighbouring counties, boosting production. Somehow, the stakeholders manage their relations and transactions to ensure a continuous supply of indigenous vegetables in the markets. Payment systems are also adapting to the MPESA 'Pochi la Biashara'⁵, which essentially safeguards the payments made to the market stalls and roadside sellers.

4 Include more ref like <https://www.acts-net.org/2018/images/Publications/Policy-Briefs/Agriculture/Hortinelea-Policy-brief-0012017c.pdf>

5 A product offered by Telecom companies for business owners such as food vendors, small kiosk owners, boda-boda operators, secondhand clothes dealers, etc. to receive and separate business funds from personal funds on their mobile money service.

What can be done in the sector?

Considering the above, there are many opportunities for informal actors to contribute even more positively if the value chain can grow. On the flipside, growth may mean that women and agro-biodiversity lose out. A holistic approach is needed to nurture the positive roles the informal actors play in the use of indigenous knowledge. Some ways forward could be:

Recognising informal actors and cataloguing indigenous knowledge

Recognising and supporting the contributions of informal actors is essential for safeguarding and expanding their positive contributions in the food system. Integrating traditional knowledge and indigenous practices into food safety regulations can preserve cultural heritage while ensuring food safety standards are met. Tacit traditional knowledge e.g. on preservation processes, such as fermentation could be developed and curated, so that products can be certified and made available for a larger consumer base e.g. in supermarkets.

Importantly, these measures in the formal sphere should be running parallel to the informal value chain. For this, regulation and certification bodies, such as the Kenyan Bureau of Standards (KEBS) and Kenya's Industrial Research and Development Institute (KIRDI), both tasked with ensuring food reaching consumers is safe, should find ways to partner with local communities to ensure this knowledge is harnessed without excluding the indigenous knowledge holders.



Figure 9: Indigenous vegetable seller at Bahati Market, Uasin Gishu County.

Increase women's involvement in decision-making at all levels

To nurture and expand the roles women currently play in the value chain, gender-inclusive policies are required that promote equal access to productive resources and training opportunities, and protection against harassment. Active involvement of women in decision-making processes at all levels is needed, including participation in farmer cooperatives and pricing discussions. This should be customised at the level of county laws to be as practical as possible.

Targeted programs to empower women in agriculture, providing resources, training, and market information, would complement these efforts greatly. Radio programs aired in the evening at specific hours with provision for call-ins or role plays are a great starting point. 'Gender desks' (organised in collaboration with the local government of Tana River) could be set up within marketplaces to address harassment cases, ensuring women have access to safe reporting spaces. Policies that penalize harassment in the informal economy should be promoted.

In the particular case of Tana River County, investments in small-scale, cold-chain infrastructure would provide an answer to post harvest losses. Some old infrastructures could be revived, such as the aggregation centres established by WHH⁶ a decade ago, in combination with reliable electricity sources and targeted subsidies for cold-chain infrastructure.

Multistakeholder approaches

The value chain is multi-actor and multifaceted. A multistakeholder approach could be a way forward to ensure that informal actors thrive more in their positive roles. By addressing these aspects collectively, the informal food sector can be made more sustainable, and be better integrated into the broader economy, thereby, improving the livelihoods of the many informal actors to nurture indigenous knowledge for better nutrition, agro-biodiversity and inclusive livelihoods improvement.

6 WeltHungerHilfe

References

- Abel, Otieno Benard and Gor, Cristopher Obel and Okuro, Samwel Ongwen and Omanga, Paul Abuto and Bokelmann, Wolfgang (2019). The African Indigenous Vegetables Value Chain Governance in Kenya. *Studies in Agricultural Economics*, 121 (1). pp. 41-52. ISSN 2063-0476
- Abukutsa, O. M., Henze, J., Opiyo, A., (2021). Production and Marketing of African Indigenous Leafy Vegetables. Available at: https://www.egerton.ac.ke/images/egerton_university/downloads/documents/hortinlea2020_production_and_marketing_of_african_indigenous-leafy_vegetables_compressed.pdf
- Bokelmann, W., Huyskens-Keil, S., Ferenczi, Z. and Stöber, S., (2022). The Role of Indigenous Vegetables to Improve Food and Nutrition Security: Experiences From the Project HORTINLEA in Kenya (2014–2018). *Front. Sustain. Food Syst.* 6:806420. doi:10.3389/fsufs.2022.806420
- Dawson PR. (1999). The Biodiversity of Traditional Leafy Vegetables. Edited by J. A. Chweya and P. B. Eyzaguirre. *Experimental Agriculture*. 2001;37(2):269-274. doi:10.1017/S0014479701212071
- Irungu, C., Mburu, J., Maundu P., Grum, M., Zeledon, I. (2007). Marketing of African Indigenous Vegetables in Nairobi and its implications on on-farm conservation of biodiversity *Acta Horticulturae* 752 (752) 197-203 Available at: https://www.actahort.org/books/752/752_31.htm
- Keatinge, J. & Yang, Ray-Yu & Hughes, Jacqueline & Easdown, Warwick & Holmer, Robert. (2011). The importance of vegetables in ensuring both food and nutritional security in attainment of the Millennium Development Goals. *Food Security*. 3. DOI: <https://link.springer.com/article/10.1007/s12571-011-0150-3>
- Maundu, P. M. (2018). The Status of Traditional Vegetable Utilization in Kenya. Available online at: https://www.biodiversityinternational.org/fileadmin/biodiversity/publications/Web_version/500/ch09.htm (accessed October 20, 2021).
- Moore, C., Raymond, R.D., (2006). Back by popular demand: the benefits of traditional vegetables. Available at: <https://alliancebiodiversityciat.org/fr/node/1491>
- National Research Council (2006). *Lost Crops of Africa: Volume II: Vegetables*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/11763>.
- Oduor, F., Kaindi, D., Abong, G., Thuita, F., Termote, C. (2023) Diversity and utilization of indigenous wild edible plants and their contribution to food security in Turkana County, Kenya. *Frontiers in Sustainable Food Systems* 7: 1113771. ISSN: 2571-581X. Available at: <https://alliancebiodiversityciat.org/publications-data/diversity-and-utilization-indigenous-wild-edible-plants-and-their-contribution>
- Onian'go R., Shiundu, K., Maundu, P., Johns, T. (2006). Diversity, Nutrition and Security: the case of African leafy vegetables in Hunger and poverty: the role of biodiversity pp 83-101 Available at: http://erepository.uonbi.ac.ke/bitstream/handle/11295/84920/Oniang%27o_Hunger%20and%20poverty%20%20the%20role%20of%20biodiversity.pdf?sequence=1&isAllowed=y



Wageningen University & Research
P.O. Box 47
6700 AB Wageningen
The Netherlands
T +31 (0) 317 48 07 00
www.wur.eu

The mission of Wageningen University & Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 6,800 employees (6,000 fte) and 12,900 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.
