



**UNIVERSITY OF NAIROBI**

# **POLICY BRIEF**

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## Message from the Editor-In-Chief

**T**he UoN Policy Brief series are published by the Office of the Associate Vice Chancellor, Research Innovation and Enterprise on a quarterly basis. We encourage authors to submit policy briefs for publication as a way of disseminating their research findings and informing policy. The University of Nairobi has continued to play a pivotal role in Kenya and beyond through research, innovations and enterprise. Policy Briefs have become one of the major avenues by which our researchers are able to present a snapshot of their research findings in a way that practitioners and decision makers easily understand, and therefore making it easy to pick major policy issues.

I am delighted to release this first edition of the UoN Policy Briefs for the year 2022 which comes after slightly over a year since we last released the last edition, then processed under the Kenya Policy Brief series. I wish to congratulate all the authors and contributors who have participated in the current issue of the UoN policy Briefs.

The current issue has focused on a diverse array of areas including Food Security, Covid 19 Responses and Interventions, Improved Crop Varieties, Gender-Based Violence against Women, Students Violence, People Living with Disability and Implementation of the Competency Based Curriculum.

**Prof Justus M Munyoki,  
Editor In Chief  
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# Improved Pigeon Pea Varieties: An alternative source of proteins for dry lands inhabitants of Kenya

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## Key Policy Messages

- **Locally underutilized crops like pigeonpea, are cheap source of protein” *poor man’s meat*”**
- **Promotion of farmer’s awareness on the significance and nutritional value to enhance production and consumption**
- **Engagement of county governments in promotion of pigeonpea in County Integrated Development Plan and leverage government extension services to increase acreage, seed subsidy and investment for sustainable pigeon pea production**

## Introduction

The pigeonpea (*Cajanus cajan* L. Millsp.), also known locally as Nzoho and commonly referred to as Mbaazi, is the sixth most widely cultivated food legume in the world, behind dry beans, chickpeas, field peas, cowpeas, and lentils (Seleman et al., 2016; FAOSTAT 2020). Pigeonpeas are a leguminous crop with many uses, including those for food, fuel, timber, thatching for houses, and cattle feed (Adjei-Nsiah, 2012). The lucrative, tasty, and protein-rich leaves and pods make excellent feed. In places where alfalfa cannot be farmed, leaves are occasionally substituted for alfalfa in the diets of ruminants. In Kenya's smallholder production methods, pigeonpea is a crucial crop. Many semi-arid and drought-prone locations in the area cultivate this drought-tolerant crop. It is a nourishing legume that has higher quantities of proteins (18–23%), phenols, flavonoids, and antioxidants (Cheboi et al., 2019). It is also a nitrogen-fixing legume that may be cultivated by farmers with limited resources without the use of fertilizers and has the potential to improve soil fertility. In heavily populated areas with little available land, it is frequently produced as an intercrop alongside cereals like maize, sorghum, and finger millet. As a result, farmers can profit from using the vegetable grain. Pigeon peas can be consumed in form of dehulled pigeon peas grains, green grains, dry



pigeon grains and blends of wheat and pigeon peas value added products (Plates 1-5)



**Plate 1:** A mature pigeonpea plant



**Plate 2:** Dehusled pigeon peas grains



**Plate 3:** Pigeon peas green grains



**Plate 4:** Dry pigeon grains



**Plate 5:** Blend of wheat and pigeon peas value added products

## Issues

Malnutrition remains a major challenge in semi-arid lands in Kenya posing a major threat to the well-being of children. Children under the age of five are chronically or permanently malnourished in 30% of cases (stunting). The percentage of stunting in Elgeyo Marakwet County has been reported to be 45.5 percent, which is greater than the 26 percent national figure. At 40%, stunting rates were also high in the lower and hanging valley of the Kerio valley. Similarly, it was noted that 9.1% of people were



wasted and 24.2% of people were underweight (Kipyego and Mugalavai 2019).

This is mainly due to climate change, degradation of land and crops, climatic shocks and droughts, poverty, insufficient access to basic food staples, inadequate infrastructure, and population rise. Rift Valley farmers are used to growing maize and common beans all year round. Due to the adverse environmental effects most of the crops do not survive compromising food availability and malnutrition. Despite being primarily regarded as an orphan crop, pigeon pea production in Kenya's dry regions has enormous untapped potential for growth in both quantity and quality. Pigeonpea, more than any other locally adapted legume, combines ideal nutritional profiles, high environmental stress tolerance, high biomass productivity, and the majority of nutrient and moisture contributions to the soil. Promotion and adoption of this crop can offer a potential solution to the dryland inhabitants to improve their health being through consumption of nutritious diets. There is also limited information on pigeonpea nutritional value and utilization. Creation of awareness would increase level of consumption of the nutritional diets leading to improved health being.

## Interventions

In order for them to flourish and yield high yields in semi-arid regions of Kenya, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has developed and released improved varieties in collaboration with other organizations like the Kenya Agricultural and Livestock Organization, University of Nairobi, Egerton University, and Leldet Seed Company. ICEAPs 00554 and 00557, two medium duration pigeonpea varieties, are now being used by the majority of farmers in eastern Kenya. The recently introduced medium duration pigeonpea varieties like ICEAP 00850, Egerton Mbaazi M1, and

advanced breeding lines like ICEAPs 00554 and 00557 have just recently begun to be adopted by a small number of farmers in the Rift Valley. New three potential genotypes have been identified with potential traits of drought resilience, high yield, nutritious, early maturing, high ratoonability, tolerant to insect pest complex and with great vegetative growth that can be utilized as animal feed. Therefore, promotion and adoption of these varieties can significantly reduce the malnutrition rate which is quite high than Kenya's national average of 26 %.

## Recommendations

- Promotion of the three identified genotypes and create awareness of their nutritional value to enhance nutritional security.
- Incorporation in County Integrated Development Plan and leverage government extension services to increase acreage, seed subsidy and investment for sustainable pigeon pea production.

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# Lessons from pandemic waterscapes in Nairobi: Call for Increased Preparedness and Holistic Approaches

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## Key Messages

- Covid-19 triggered unprecedented yet limited changes in Nairobi's water supply (e.g. free water in informal settlements).
- Free water and new boreholes (e.g. in Kibera) have probably not curbed the spread of Covid-19 and have not changed structural water problems.
- Grid-dependent areas (e.g. Eastleigh) have seen decreasing water security and increasing water expenses.
- For (health) crisis preparedness and general improvements, holistic, long-term, and multi-stakeholder approaches are necessary.

## Introduction

At the beginning of the Covid-19 pandemic, experts recommended frequent handwashing (WHO & UNICEF 2020) but efforts were constricted by uneven water access. Generally, the pandemic challenged policy makers, service providers, and populations to respond to changed water demand and supply, decreased revenues and income, government directives, and health threats. Since the enactment of Kenya's 2016 *Water Act*, water distribution and governance in Nairobi has been the responsibility of Nairobi County Water and Sewerage Company (NCWSC), Athi Water Works Development Agency (AWWDA), Nairobi City County (NCC), and other agencies. As the utility, NCWSC should ensure 'that all stakeholders receive water regularly and efficiently' but their supply has a daily deficit of 300,000 m<sup>3</sup>. Thus, NCWSC opts for water rationing, and only 76% of households in Nairobi can access piped water, with lower rates in low-income or informal areas (Kasper & Schramm *forthcoming*). Households – both grid-connected and not – rely on non-piped water supply (Wamuchiru 2017), mostly operated by unregulated actors. Holistic (health) crisis action plans for the water sector did not exist prior to Covid-19.

## Research Approach

In 2021/22, we conducted research in two water-challenged areas (Kibera and Eastleigh) to understand how Nairobi's waterscapes have changed during the pandemic; how these changes relate to new health requirements; and in how far they reflect adaptive creativity or (re)produce fragmentation. For this, we carried out field visits, 20+ expert interviews (government agencies, utility, NGOs, etc.), 40+ interviews with residents, water vendors, and local leaders, and a household survey with 900+ respondents.

## Findings

The onset of the pandemic coincided with the establishment of the Nairobi Metropolitan Services (NMS), to which core functions were transferred from NCC, e.g. water sector issues. In April 2020, a presidential directive mandated water providers to supply free water to informal settlements to support handwashing. For this, NMS – together with NCWSC and others – deployed water tankers and installed about 200 new boreholes. The use of tankers and boreholes signifies a departure from networked supply as single solution. However, free water provision via tankers in informal settlements fizzled out in 2021 and residents deemed the provision confusing and irregular. More so, the functionality and future of new boreholes is questionable, since a) many were erected in non-publicly accessible sites, b) some have never been operational, and c) who will continue to run them and cover the costs remains unclear.

Being Nairobi's largest informal settlement, **Kibera** benefited from free water. Since its origins, Kibera has been dominated by informal and non-networked supply. About 70% of survey respondents indicated that before, during, and after the height of the pandemic their main water source were private vendors. 38%

confirmed that they received free water at least once, but most of them only got it for some weeks/ months and it was only accessible to those close to tanker points or boreholes. While mere water availability has not been a major issue in recent years, a key problem is unregulated and high water prices. With 20 litres usually costing 3-5 KES before Covid-19, prices went up to 20 KES in some places. Yet, monthly per capita expenditure for water saw *only* a spike of 18% in 2020/21 (see Eastleigh), which is an unintended result of free water, since – due to the competition – price increases by vendors remained moderate. Yet, given the economic effects of the pandemic, 47% of respondents adapted their water uses, e.g. self-rationing and water recycling techniques. Water consumption and costs in 2022 remain higher than before Covid-19 but neither the pandemic itself nor the free water have changed Kibera's waterscape drastically.

In **Eastleigh**, water availability has clearly decreased since 2020, while free water initiatives were absent. For long, water has largely been supplied via the network, and 66% of survey respondents named piped water as their main water source in 2019. This dropped to 54% for 2022, while water delivery (jerry cans) as main source rose from 9% to 16%, and – as of 2022 – more than 50% named such delivery as one of their sources. As key reasons, various respondents named a drastically more erratic piped supply, caused by population growth and aging infrastructures. In combination with the pandemic, this resulted in a spike of monthly per capita water expenses of 44% in 2020/21, since many resorted to less regulated water sources. Hence, 35% indicated that they are now recycling water, and the use of water storage increased. Nearly two thirds of respondents assess their current water situation as (much) worse than in 2019. Eastleigh has also experienced a surge in boreholes before and during the pandemic. All these findings indicate

a negative trajectory for Eastleigh's waterscape, with residents relying more and more on non-networked, non-public supply.

Comparing Kibera and Eastleigh during the pandemic shows the limitations of looking at waterscapes via simple logics (e.g. formal/informal or connected/unconnected). Decentralized supply in Kibera was less affected, which cannot be explained by free water only, while grid-dependent Eastleigh has seen a further deterioration of its waterscape. In both areas, water consumption increased, but respondents justified this with more time at home, not handwashing. Free water has unlikely helped to fight the pandemic, instead queuing at free water points could rather increase transmission. Thus, although free water had unintended effects (e.g. less price increases in Kibera), it was not part of holistic plans to combat the inequalities in Nairobi's waterscape.

## Recommendations

### Short Term

- Adhere to and strengthen the existing responsibilities and collaborations of actors in the water sector as laid out in the 2016 *Water Act*.
- Clarify roles, responsibilities, and financial aspects around new boreholes for them to have a long-lasting impact.

### Medium Term

- Fully register, regulate, and monitor small-scale water providers to ensure water affordability and quality.
- Equip NCWSC and AWWDA with appropriate resources to expand, maintain, and upgrade infrastructures.

- Create water sector action plans for future (health) crises that are aligned with infrastructure and sector planning goals.

### Long Term

- Involve local communities and private water providers in policy and planning processes to ensure appropriate and realistic policy frameworks and water projects.
- Include non-networked and non-public water supply modes into planning goals, documents, and policies to ensure safe water access.

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People queuing for free water at a newly erected borehole in Kibera, Silanga

**Photo:** Moritz Kasper, 2021

# Gender-Based Violence against Women Who Use Drugs in Kenya: Experiences and Policy Directions

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## Key policy Issue

- **The achievement of SDG 3, 5 and 10 depend to a great extent on how governments deal with vulnerable populations. This policy brief responds to Kenya’s Vision 2030 social pillar by focusing on gender-based violence against women who use drugs and recommends policy, legal and institutional improvements.**

## Introduction

Vulnerable populations including women who use drugs suffer levels of gender-based violence estimated to be up to five times that of non-drug using women (Gilbert et al., 2015). Specifically, women who use drugs suffer sexual violence at the hands of drug sellers, clients in sex work and law enforcement officers (UNODC, 2019). Gender-based violence among women who use drugs is predicted by poor education, prior exposure to family abuse, a history of drug use, poverty and social norms tolerant of abuse (Abramsky et al., 2011; Capaldi et al., 2012; WHO, 2013). Additionally, having drug-using partners and sex work increase the risk of victimization (Pack et al., 2014). Gender-based violence against this vulnerable population has mental and sexual health implications in addition to other social and economic costs. It is an issue that requires urgent attention by policy makers, law enforcement, advocacy groups and health providers.

## Methodology used and Results of the Study

The qualitative study on prevalence, experiences and socio-structural factors supportive of gender-based violence sampled women who use drug in Mombasa and Kilifi, representatives from government departments related to the welfare of women who use drugs and local leaders. Data were collected using focus group discussions and in-depth interviews. Findings indicate high prevalence of physical, psychological, and sexual abuse with multiple intersections. Sexual abuse was perpetrated by intimate partners, drug-using partners and sex work clients and intersected with verbal, psychological and physical abuse. Children of women who use drugs suffered separation from their mothers, verbal abuse and estrangement from family. Normalization of violence, unclear reporting protocols, dependency and societal attitudes towards sex between adults increased the likelihood of abuse. These results point to the urgent need for policy directions on the issue of gender-based violence against women who use drugs.

## Conclusion

Women who use drugs face diverse and intersecting forms of verbal, psychological, sexual and physical violence that is perpetrated by societal and legal structures that require urgent re-examination.

## Policy Recommendations

### Short Term

- The Kenya Police Service eliminates barriers in processes of reporting abuse including gender desks and functional hotlines; and puts in place mechanisms to eliminate inefficiency, brutality and corruption through training, emphasis on

ethical behaviour and awareness of the needs of women who use drugs.

- The Ministry of Health develops mechanisms to incorporate clinical personnel from organizations working with women who use drugs in filling P3 forms through accreditation and training.

### Medium to Long Term

- State and non-state actors work towards the economic empowerment of women who use drugs through microfinance support, involvement in paid public work programs and skills/talent support.
- State and non-state actors focus on training of women who use drugs and organizations and departments directly involved with women who use drugs on evidence preservation following abuse and related law.
- State and non-state actors prioritize psychosocial support including training in life skills, counselling and mentorship for women who use drugs and their partners and support for children.

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# Students Violence: Facts, Analysis and Strategies

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## Key Policy Issue

- The social order among people within society may significantly curb and bridle the natural passions which drive students to partiality, pride and violence.
- Student violence initiates a whole process in the government concerning mitigations, extended surveillance and organization of schools.
- Students use protest to achieve their goals and these may take many forms from petitions to rioting in the street.
- The allocation of authority within schools (Prefect system/students council) pose a certain paradox to the functioning administrative systems.
- The internet and new communication technologies have created and maintained social networks across time and space, and one can argue that these characteristics have contributed to the ever-recurring student violence in schools today.

## Introduction

On 13<sup>th</sup> of July, 1991, male students at St. Kizito Mixed Secondary School ambushed their female colleagues and raped them leading to the death of nineteen female students and more than 70 girls raped or gang raped (Shadle, 2008). This incident marked a paradigm shift in the school administration with various voices from the government and community. The results of this incident among others that followed are, evidently, an issue that leaves few unaffected. The schools are at crossroads and Kigotho (2007) avers that the violent patterns in schools often mirror levels and patterns of violence in the respective nations and at the domestic level. Regarding secondary school, researchers have observed the tendency among youth to challenge authority on various grounds (Ngesu, 2011, Yego 2008). In Kenya, student violence has continued to be reported regularly on the national news and other social media platforms. The main concern in this discourse is the changing nature of student violence and its recurrence which seems stem in part from students' dissatisfaction with poor administration, incidences related to community lures and negative influences of opinion leaders.



## **Methodology and Results of the Study**

The study's ex-post facto research design involved head teachers and students from secondary schools in Machakos County. Data was gathered using three different methods: questionnaires, interviews, and Focus Group Discussions. The study established that the majority of students—whether they are male or female—use violence to further their objectives and obtain what they desire. This is characteristic of students who are subjected to aggressive media, environment, and more frequently, a violent familial context. Victims of student violence frequently experience fear of going to school, which hinders their ability to focus. The study found that violent behavior promoters are more likely to engage in violent behavior in the future.

## **Conclusion**

Violence seems to be an adaptation of a response to structural stress. The main concern in this discourse is the changing nature of student violence and its recurrence which seems to stem in part from students' dissatisfaction with poor administration, incidences related to wider community lures and negative influences of opinion leaders. The long-term impacts of students' violence and its ramifications, in the form of violent confrontations, arson and school skirmishes, include poor academic results for the students and the school in general; post-trauma stress suffered by learners and a protracted sense of mistrust. The cumulative complexity of these impacts may not be amenable to a simple, ready-made formula of solutions, but rather to creative and often unconventional strategies to resolve conflicts.

## **Policy Recommendations**

### **Short Term**

- The Ministry of Education should encourage head teachers to hold regular meetings with student councils and be open to students when airing grievances. The channels for expressing these frustrations should be responsive because this is an indication that their voices are heard through regular meetings.
- Guidance and counseling programs in schools need to be improved. Investment in a guidance and counseling program will raise the standard of the services provided and start to dispel public misperceptions and anxiety about the current teacher preparation program.
- Schools, which serve as centers of learning, should have an inclusive curriculum that is carefully and effectively crafted, and co-curricular activities that are sufficient to meet all of the academic and extracurricular demands of students.
- The Ministry of Education should encourage head teachers to provide practical leadership that demonstrates a commitment to their work as well as maintaining relations with others.

### **Long Term**

- On policy issues, the Ministry of Education should embrace the bottom-up approach to policy making and all stakeholders in education should be encouraged to participate actively for the wellbeing of this nation.

- Policymakers in the Ministry of Education should seize every opportunity to address teacher training through specific in-service programs by disseminating the research findings.
- Students who require special attention, which cannot be provided by the school be transferred to approved schools, with properly equipped materials and parents to see them as optional corrective centers.

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# Implementation of CBC in Kenya in crisis. What are the Policy Options?

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## Key Policy Issue

- For effective implementation of the Competency Based Curriculum (CBC) the Government needs to involve stakeholders in curriculum review and implementation.
- The Government should consider identifying an institution that will be equipped and facilitated to train teachers for STEM subjects.
- In regard to implementation of the curriculum, there is need for accurate and continuous communication, for example, where various levels of education should be domiciled, required qualification of teachers at each level, resources required and sources.
- All teacher training institutions should be facilitated to urgently review their curricula to focus on the CBC system.
- Real time data on the progress of implementation of CBC should be used to make appropriate adjustments.

## Introduction.

After independence, several commissions were formed introducing several changes and reforms in the education system. The type of education offered needs to take cognisance of societal and student needs, learner's age, ability of parents, accessibility to required resources and the environment for successful implementation.

In 2017, the Government of Kenya introduced the CBC system of education to replace the 8-4-4 system which was introduced in 1985 to replace the 7-4-2-3 system. With the introduction of each of the systems a number of issues remain unclear both to the implementers as well as stakeholders. The 8-4-4 system was designed among other reasons to enable students who could not continue with secondary education to transition into self-employment or seek employment in the informal sector. However, the 8-4-4 system did not fix the challenges of 7-4-2-3 system. Then came the implementation of the CBC system, unfortunately the premise of changing to this system was not based on adequate research and stakeholders' involvement.

Following the introduction of the CBC system, challenges have been observed and raised in various forums. To begin with, over the last six years, there have been concerns as to what the future of the system is, with regard to transition, affordability and the expected outcomes. Further, in January 2023, there will be two cohorts of learners earmarked to join secondary

school. The question of where junior secondary learners will be domiciled has been addressed but the cadre of teachers to teach them remains unanswered.

Additionally, the government ought to take stock of available physical infrastructure, personnel and provide clear direction of action plans regarding the number of additional classrooms, number of teachers and equipment to support teaching of practical oriented disciplines.

Notably, with the challenges being experienced and expression of dissatisfaction by parents and the society, fears are that the CBC system may not provide the desired results if a different approach is not taken.

As implementation of the CBC system progresses, the following questions remain unresolved:

- Why would the government continue preparing teachers for a curriculum that is being faced out?
- Which teacher training institutions will train teachers to facilitate teaching of Science, Technology, Engineering and Mathematics (STEM) - subjects that are emphasized in the CBC?

## Research Methodology

The overall aim of the study was to review the progress of implementation of the CBC as at September 2022 when a task force was appointed to evaluate, assess and recommend an appropriate structure to implement the system of education with the intended outcome being provision of quality education and lifelong learning for all (Republic of Kenya, 2022).

The research was conducted through the qualitative approach, data was collected through Focus Group Discussions (FGDs) and integrated with data collected through desk top

analysis. Participants in the FGDs were academic staff from Faculty of Education, University of Nairobi.

## Results of the Study Findings

Sensitization of the education reforms was done to some extent although it was not systematic and was not well coordinated.

Higher education institutions have not reviewed curricula in recognition of the fact that teacher trainees will handle CBC students at secondary level.

There are no specific training institutions to train teachers for STEM subjects, yet they are emphasized in the CBC.

The curriculum in universities does not factor in the needs of students who will be enrolled after completing CBC at secondary level.

The cadre of teachers who will teach junior secondary learners and the reporting line is not clear.

Universities are currently not training teachers to teach technology and engineering subjects.

## Conclusion

Training and re-tooling of teachers needs urgent attention, on the same breath teacher training institutions need to train teachers for CBC implementation. Classrooms for grade nine need to be constructed because grade seven and eight will adequately be accommodated in the current primary school set up. Also, laboratories should be set up in secondary schools for Technology and Engineering courses.

## Policy Recommendations

### Short Term

- 36,432(16, 5%) teachers of the total workforce at primary level are PHD, Masters, Bachelor or Diploma holders. This number is adequate to start teaching

grade seven with few transfers and recruitment of new staff.

- Universities offering Education courses and Diploma Teacher Training colleges need to review their curricula.
- The government should consider identifying one institution to be equipped to train teachers for technical and engineering subjects.
- Initiation of an all-inclusive continuous staff development program to cater for pre-primary to university level.

### **Long Term**

Future educational reforms should apply a participatory, approach, be systematic and well-coordinated.

### **Acknowledgement**

This policy brief is based on study findings and review of government reports on education commissions and education task force reports focusing on curriculum design and implementation.

Further we acknowledge the Faculty of Education for their participation in the FGDs.

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# Women's Working Conditions in Kenya's Flower Farms: Policy Options and Recommendations

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## Key Policy Issue

- **The aim of this policy brief is to raise awareness about the working conditions for women workers in the flower farms. It draws attention to the subtle indifferences and biases experienced by women workers that impede on their rightful benefits that male counterparts unconsciously enjoy such as capacity development opportunities which have a direct influence on promotions and leadership roles. It also makes some recommendations to be considered by the policymakers to take the requisite actions to improve the working conditions of women in the flower farms.**

## Introduction

This policy brief argues that unless effective policies are put in place to improve the labour and working conditions for female workers, flower farms are likely to perpetuate and deepen gender inequalities. This policy brief will hopefully serve as a reference point for scholars, policymakers and other stakeholders with an interest in conducting advanced research on this subject. Hopefully, this policy brief will increase the level of awareness about the plight of women workers in Kenya's flower farming industry, and fill the gaps in knowledge and our understanding of the current labour and working conditions for women workers in the flower farms in Kenya. The study has highlighted the challenges women workers experience in the flower farms in Kenya which include sexual harassment and discriminative working conditions. It was recommended that these challenges and other concerns related to the welfare of workers should be addressed as a first step towards reducing gender inequalities and bringing about real change for women workers in flower farms in Kenya.

This brief draws on data collected from women workers who participated in a qualitative study carried out in four conveniently selected flower farms in Kiambu County.

The study found that the overall labour and working conditions of women workers in the selected flower farms were both exploitative and

deplorable. The challenges identified in the study include and hasty overtime due to last-minute orders, short and temporary engagement contracts renewed at the whims of male supervisors, sexual harassment and abuse, and discriminative working arrangements. The study also revealed that most of the skilled and well-paid permanent positions and equipment-intensive tasks were done by men whereas the majority of women occupied unskilled, lowly paid, part-time and insecure positions and performed time-intensive tasks which took longer to complete such as flower weeding, thinning, packing, grafting, and sorting. These are low skilled jobs, earning less, and were willing to work for lower wages due to a general lack of alternative avenues for employment.

The study established that most management positions had more men and that, women workers rarely joined trade unions which effectively excluded them from decision-making forums, where they could negotiate for better labour and working conditions. Women also had fewer opportunities to access training and upward mobility to strengthen their legal knowledge of the flower sector. It is, thus safe to state that, patriarchal norms, beliefs, and values prevent female workers from equitable participation in the flower farms, even though many workers who were interviewed said that they find it a good job and seek improved working conditions, better terms of employment, training, and upward mobility. This, therefore, negates the basic gender equality domains of access to equal opportunities, participation in decision-making and improved systems that create an equitable environment that addresses the different needs of men and women.

## Conclusion

In as much as women make vital contributions to flower farming in Kenya, where they constitute a large majority of the workforce,

they rarely participate in decision-making organs. Most women are typically clustered in unskilled, low-paying, and precarious casual jobs and often subjected to gender violence and sexual harassment, and unfavourable terms of employment.

There is an urgent need not only to raise awareness about the existing labour policies and legislation but also to develop support strategies for female workers in flower farms. The research highlights several important policy directions.

## Recommendations

### Short Term

- Immediate need for sensitization, advocacy and awareness creation for employers and employees to enforce and adhere to the existing ethical guidelines, policies, and labour laws on issues such as equal pay for work of equal value, wage transparency, sexual harassment, and better working conditions would help improve the quality of work performed by women.
- Provide women workers with training that would enable them to get promoted to higher paying works (such as pesticide application and pruning), more education about women's rights and labour laws specific to the flower sector and gender equality.
- Provide technical assistance to female workers including training on occupational health safety and equipment as well as techniques for increasing their productivity.
- Civil society actors should advocate on behalf of the workers generally and women workers specifically for improved working conditions. Such interventions could help ensure that the

existing labour laws are adhered to and that the rights of workers are enforced according to the current country's labour laws.

- Increase in women workers' participation and representation in trade unions and collective bargaining agreements and address any barriers that limit this participation.
- Set up gender committees in each farm to provide women workers with an avenue through which they can channel and voice their grievances.

### Medium Term

- Government actors must ensure female workers are consulted in any policy developments and reforms in the flower sector and its supply chain as well as ensure policies reflect and represent the voices of women workers in the flower farms.
- Promoting gender equality and more women workers' participation in decision-making positions and increasing the involvement and representation of different groups of women in management and decision-making.
- Allow women workers to join trade unions as stipulated in Kenya's labour laws and to take part in collective bargaining and management activities as prerequisites for improving their working conditions on the farms.
- Ensure that global and national principles that promote gender equality, human rights, and company employment policies are enforced.
- Collaborate with trade unions, civil society organisations, county and national governments, human rights

organisations, and other multi-stakeholders to safeguard the rights of women workers and provide women workers with access to an effective remedy when necessary.

### Acknowledgements

This policy brief is an offshoot of a study by Scholastica Kanyua Kaaria, titled "Gender and Floriculture: Investigating the Working Conditions of Women in the Flower Farms in Thika Sub-County, Kiambu County, Kenya" which was a Master of Arts in Gender and Development Studies project at the Department of Anthropology, Gender and African Studies, University of Nairobi. The project was supervised by Prof Tom Ondicho.

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# Towards PwDs - Inclusive Urban Transport System in Nairobi Kenya

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## Key Message

- **Despite policy provisions, there's eminent neglect of "special needs" of PwDs in transport and road infrastructure planning and implementation.**
- **There is little evidence of everyday experience, mobility behavior patterns and needs, and challenges of PwDs in Nairobi.**
- **The application of universal design standards offers an opportunity to plan and implement a PwD-inclusive urban transport system.**

## Context

The New Urban Agenda envisages inclusive cities including transport systems for PwDs without discrimination (UN, 2017). Kenya ratified UNCRPD in 2008 and thus Kenyan Constitution 2010 and through the Persons with Disability Act of 2003 (Revised 2010) upholds PwDs inclusivity in urban transport system.

Literature review confirms limitations in accessing transportation systems as the most crucial physical exclusion of PwDs (Danso, Atuahene & Agyekum, 2019). Fears of crime and intimidation result to reduced trips and increased social isolation of PwDs. Other transport challenges are associated with the absence of functioning transportation and lack of safety facilities (Sheer, Kroll, Neri, & Beatty, 2003); inaccessible information for scheduling trips; long waiting and travelling periods; cost of services (Church & Marston, 2003; Zambia-Banda-Chalwe & De Jonge, 2013); as well as unreliable services (Bezyak et al., 2017; Lubin, 2012; Rapengo & Ravaud, 2017; Wu, Gan, Cevallos, & Shen, 2011). Disability-unfriendly vehicles dominate the urban transport modes and lack adequate space or mechanisms for easy access by PwDs. Transport operators also



charge an extra fee to convey mobility aids like wheelchairs (Ngenbe, 2020). However, there's little evidence of daily experience, mobility behavior patterns, and challenges of PwDs in fast-urbanizing cities like Nairobi, where PwDs lack a voice and the power to influence decisions (Bordia Das et al., 2017).

## Approach and Results

The study examined the design of urban transport in Nairobi, daily mobility patterns, needs, experiences, and challenges of PwDs in accessing urban transport. Based on 2019 Kenya population census, 69 visually, 55 hearing, and 84 mobility impaired PwDs were engaged. The project adopted various research instruments: semi-structured questionnaires; Journey Access Tool; interview guides for key-informants and transport operators; and stakeholders' workshops.

The study findings demonstrate lack of adherence to the universal design principles in implementing the urban transport system in Nairobi. Despite the city's vast road network, most of them are unfavourable to PwDs. Barriers such as raised and broken curbs, potholes, open drainage channels, and

discontinuous walkways (refer to Figure 2) hinder PwDs' mobility. High-floor vehicles without ramps, lack of assistive devices and reserved seating areas in public transport vehicles hamper access by individuals with mobility problems. Poor maintenance, non-availability of sidewalks and presence of commercial activities on sidewalks constitute major accessibility challenge to PwDs (refer to Figure 1). Most PwDs cited the absence of traffic control measures such as traffic signals and dedicated pedestrian crossing lanes as a major challenge that poses difficulties in crossing urban roads.

PwDs felt that challenges in urban transport system curtailed their travel desire, contributing to their social, economic and physical exclusion in different societal activities. The Covid-19 pandemic further curtailed PwDs' desire to travel. The primary coping mechanism of PwDs is to seek assistance from strangers (aids) or minimize movement all together. Most transport operators are not aware of existing policies and laws requiring them to be inclusive to PwDs. Consequently, there is limited advocacy from various stakeholders mandated to represent the interests of PwDs in the transport sector and urban governance.



**Figure 1:** Dilapidated walkways that present difficulties to PwDs to maneuver through



## Recommendations

### Short Term

- Enforcement and operationalization of the existing policies, laws, regulations and standards concerning PwDs.
- Incremental implementation of assistive equipments and devices (e.g traffic signals) to improve inclusivity of PwDs in urban transport and public vehicles.
- Advocacy and mainstreaming of mobility needs of PwDs to the general public and different stakeholders in urban transport.
- Repair and maintenance of dilapidated walkways.

### Long Term

- Redesigning the transport infrastructure with particular focus on the well-being of PwDs using universal design principles.
- Application and mainstreaming of specialized design by relevant institutions in transport plans to ensure accessibility for all PwDs.

## Acknowledgment

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# Plasma Technology has Efficacy to Eliminate Fungi and Aflatoxins in Maize

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## Key Policy Issues

- Aflatoxin contamination of maize is recurrent in Kenya despite many interventions
- Plasma technology has efficacy to eliminate fungi and aflatoxins in maize
- Piloting of this technology is necessary in order to assure food safety before full upscaling.

## Introduction

The realisation of the sustainable development goals (SDG's) in achieving zero hunger by the year 2030 not only requires developing countries to increase the quantity of food grains produced but also improve on pre- and postharvest processes. However, food grains when stored under unfavourable conditions are prone to aflatoxin contamination (Figure 1). This subsequently poses a major threat to human health, production and marketing of food grains throughout the world.

Ideally, early control and prevention of aflatoxin contamination along the value chain is very key but is not always the case. Aflatoxins usually attack the maize at critical stages of harvesting and storage (Pankaj et al., 2018). Kenya has a long history of aflatoxin poisoning particularly in the Eastern and North Rift parts of the country leading to many hospitalised cases and even deaths (Sirma et al., 2018). In fact, in 2010, the government of Kenya condemned 2.3 million bags of maize confirmed to be contaminated with aflatoxins (Mutegi et al., 2018).

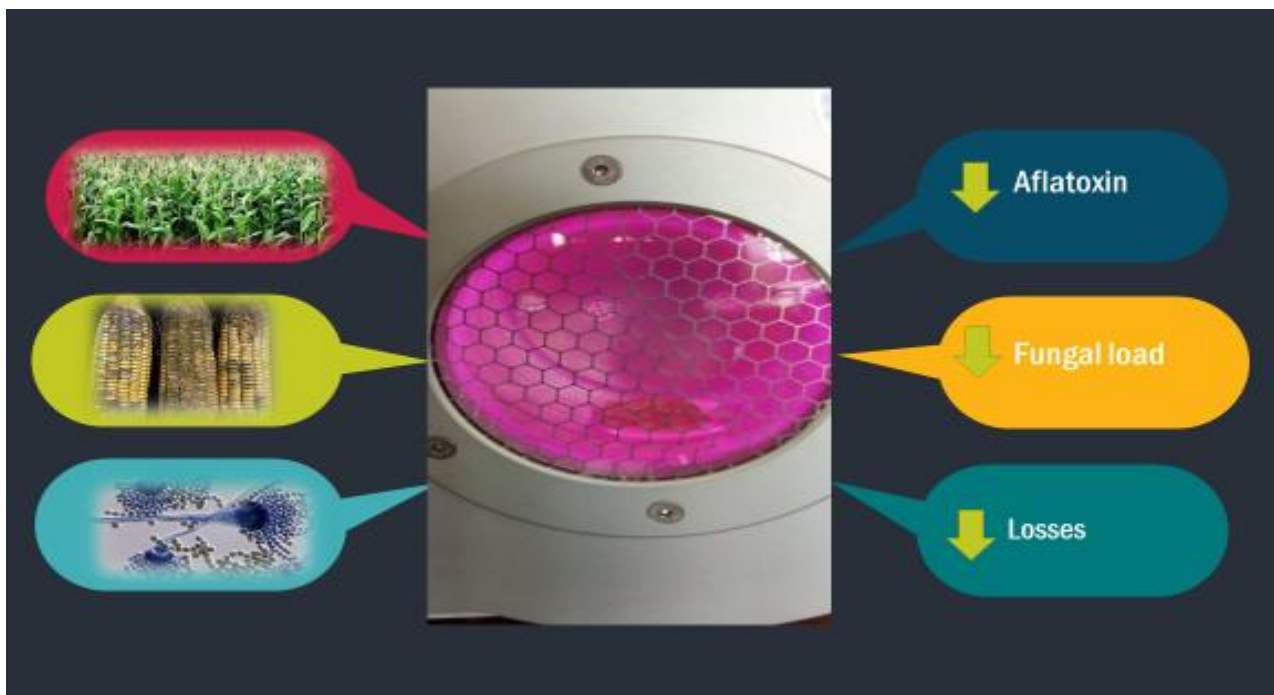
Destruction of aflatoxins by use of conventional methods such as cooking, boiling is difficult due to their heat resistant nature. In most cases, farmers opt to salvage this maize and produce home-made animal feeds, traditional alcoholic beverages or even blend with good maize and sell or consume at home. Detection of aflatoxins is also a challenge as testing is expensive coupled with shortage of analytical capacity. Low temperature plasma has potential to replace the conventional decontamination methods (Kamano, 2022; Lopez et al., 2019).



**Figure 1:** Contaminated maize grain (International Institute of Tropical Agriculture, 2022)

## Methodology used and Results of the Study

Plasma is a special environment created when a gas is electrically charged at varying conditions of temperature, pressure and ionization power. Low temperature plasma is a promising technology that is being applied in decontamination processes. Unlike many other decontamination methods, it rapidly decontaminates a food at normal conditions of temperature and pressure without causing any notable changes in quality (Misra et al., 2019). Maize samples were exposed to varying conditions of temperature, pressure and ionization power in order to identify the most optimal points for reduction of fungi and aflatoxin in the maize (Figure 2). Plasma was found have efficacy to reduce the aflatoxin content and fungal load of maize by 68.78% and 33.89 log (cfu/g) respectively. The optimal conditions being an exposure time of 153 seconds, pressure of 0.98 Pascals and ionization power of 194.82 W.



**Figure 2:** Maize sample under plasma treatment (Kamano, 2022)

## Conclusion

The study concluded that:

- Low temperature plasma does have efficacy to reduce the fungal load and aflatoxin in maize.
- To achieve a reduction of aflatoxin content of 68.78% and fungal load of 33.89 log (cfu/g) an exposure time of 153 seconds, pressure of 0.98 Pascals and ionization power of 194.82 W are required.
- During plasma treatment, an increase in exposure time and pressure leads to a corresponding decrease in both fungal load and aflatoxin content.
- Incorporation of temperature as an independent factor will perfect optimization of the decontamination process.

## Recommendations

The following recommendations were arrived at:

- i. Initial piloting to up-scale the technology while applying implementation research or science to perfect maize detoxification parameters.
- ii. Additionally, more research on potential acceptability, physical and chemical changes in food after treatment is needed.

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# Covid 19 Pandemic Government Interventions and their Implications on Shopper Behavior

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## Key Messages

- Covid-19 Pandemic prevention directives and restrictions negatively affected the economy in Kenya
- Consumer behavior determines their choice on products to purchase and response to various situations which has ramifications on economic development.
- Policies on the prevention and management of pandemics be sensitive to economic implication.

## Introduction

In the year 2020, when the World Health Organization (WHO) declared Corona Virus a pandemic, countries all over the world quickly started putting measures to control the virus while other measures were meant to support the economy from collapsing. In Kenya, the measures undertaken include restrictions on movement across certain counties, closure of all institutions of learning, social places and places of worship, compulsory use of face masks, frequent washing of hands, and use of sanitizers. Many studies on government interventions seem to focus on the implications of the interventions on the economy. For instance, Thomas and Wang (1996), Kneller, Bleaney and Gemmell (1999), and Knowles and Garces (2000). Mwangolo (2015) found that Provision of sanitary pads by the government to girls in public primary schools influenced school completion rate of the girl



child. Consumer behavior is very important as it determined whether or not they will purchase certain products, how they respond to various situations, which has ramifications economic development. Rational choice theory (Adam Smith, 1776) and functional attitude theory (Smith, Bruner, and White (1956) and Katz (1960), were used in this study to determine the effect of government intervention measures on influence on shopper behavior, and whether shopper demographic characteristics either moderate or mediate the relationship between government intervention measures and shopper behavior.

## **Approaches and Results**

The study targeted consumers drawn randomly from 107 former students from the School of Business, University of Nairobi, who graduated between 2013 and 2020 Bachelor of Commerce students, Masters Students (Mainly MBA), Phd students. Descriptive and inferential statistical analysis were applied. Out of the 107 questionnaires emailed, a total of 75 were filled, giving response rate of 70.1%. The study found that closure of institutions of learning increased the use of internet sources for information than before ( $M= 4.4667$   $MD = .90544$ ), while travel restrictions were also found to have had a major influence on shopper behavior, as all the indicators on travel restrictions had scores above 3.5, with an exception of the statement that ‘I generally no longer like travelling by air’; which had a mean score of 2.9054. As of Social distancing requirements, the statement that ‘Social distancing has affected how I interact with people in social events’ had the highest mean score ( $M = 4.4865$ ,  $SD = .92519$ ) while the other two indicators had a mean score of more than 3.4). This demonstrates that social distancing measures had implications on the shoppers. All the indicators of the intervention involving Impositions of curfew had mean scores of less than 4.0, with the highest being that of

making the shoppers more time conscious ( $M=3.9467$ ,  $SD= .98493$ ). Finally, all the indicators of Hygiene requirements had a mean score of more than 3.5, which shows that hygiene requirement measures have had a significant effect in shaving the behavior of shoppers. The study found that shopper demographic characteristics have a mediating effect on the relationship between Government interventions and shopper behaviour.

## **Conclusion**

The findings of this study shows that government intervention measures undertaken during the Covid 19 pandemic has influence the attitudes and therefore the behavior of shoppers in Kenya. This is in line with the existing theories about consumer behavior, which suggest shat changes in the environment can affect the attitudes of consumers towards certain products or brands. The study shows that not all measures have led to similar influences, with closure of learning institutions having the greatest influence and the other factors being rated at a slightly lower level.

## **Policy Recommendations**

### **Short Term Implications**

Government should work to ensure that policies and interventions implemented for prevention of pandemic are weighted against their effect on consumer behavior and immediate implications on the economy

### **Medium Term**

Government to have relevant information about shopper behavior and when implementing intervention measures, consider ones that will minimize affecting the shoppers negatively, as this can also harm the economy

### **Long Term**

The relationship between government intervention measures and shopper behavior depends on shopper characteristics. Policy

makers should always consider evidence-based research outputs on the demographic characteristics and gender disaggregated data, when implementing various interventions

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# Tapping the Potential of Periodic Markets as Nodes of Food Trade and Territorial Development: Along Machakos-Kitui Road, Machakos County, Kenya

By Mwangi, I, P.; Mwangi, I.K.; Ayonga, J. N; Mbathi. M.M, and F. W. Mugo

## Key Messages

- Periodic markets are engines of regional economies as they provide for over 82% of local agricultural produce and supply food and other commodities from external sources to local urban and rural hinterlands of Machakos County.
- A majority of periodic markets in Kenya are not planned. This is evidenced by their lack of basic infrastructure such as stalls for the display of commodities, walkways for human traffic, protection from elements of weather, sanitation and waste management facilities to function optimally. There is also limited use of technology for monitoring market trends and supply-chain activities.

## Context

The reciprocal exchange of goods, services, and currency have since the dawn of human civilisation defined community spaces. (Gregory, 2001). The origin and persistence of periodic markets are explained in terms of the needs of producers, traditional organisation of time, inertia and comparative advantage (Bromley, Symanski, & Good, 1975). Meaning that, while market days are determined by local authorities, the viability, physical planning, socio-economic and environmental impacts often go unconsidered. Sustainability remains neglected by local authorities once the niche 'suitable' set of needs is met and conveyed. Periodic farmers markets in Machakos County offer a unique view of how traditional practice infused with contemporary planning has seen systematic growth of market neighbourhoods and subsequent death of others along transport corridors. This roused curiosity about the happenstances along the Machakos-Kitui Transport Corridor.

- Plate 1 - Controlled clusters of bulls for beef, as draught animals and for breeding.
- Plate 2 - Traders in Wamũnyũ market operating in open-air stations with food arranged on canvas along the road around the market square.



Figure 2: Masii Periodic Livestock Market during market day. Image taken 11/04/2022 ©Ignatius Mwangi



Figure 3: Wamunyu Periodic Food Market during market day. Image taken 12/04/2022 ©Ignatius Mwangi

## Approach and Results

**Methodology:** The study analysed the impacts of periodic farmers markets on the development of their physical setting, assessed their contribution to the local economy, evaluated their performance and proposed interventions for resilient rural-urban linkages in a post-pandemic era for the study area.

### Research Design

The target population comprised various traders, farmer-traders, farmers, transporters and sectoral key informants. Data collection methods comprised document examination of previous studies and successful case studies of periodic markets in other parts of the world, face-to-face interviews with the target population using questionnaires, focus group discussions, key informant interviews and observation.

### Findings

The findings revealed that out of the three markets studied, only Masii Periodic Farmers Market expanded physically over time. This has had a significant impact on the growth of the host town mainly because of its strategic location. The other two (Wamũnyũ and

Katangi) have experienced limited spatial growth over time. All three market centres currently lack local physical development plans. The markets are inadequately serviced for optimal functionality, in zoning and sufficiency of physical space; for commodity-display stalls, pedestrian walkways, protection from weather elements, sanitation and waste management. There was also limited use of technology for monitoring market trends and supply-chain activities. In addition, the close proximity of the markets to the Machakos-Kitui highway leads to human-livestock-vehicle conflicts hence frequent accidents and encroachment into the road reserve. As concerns food trade, these markets provide for over 82% of the local agricultural produce and supply food and other manufactured products from external sources to the local urban and rural hinterland making them engines of the regional economy.

## Policy Recommendations

### Short-Term

- The study recommends mapping all periodic markets within the regional context of the dominant Masii-Wamũnyũ-Katangi periodic farmers market circuit in Machakos County to



- facilitate a comprehensive understanding of market dynamics, supply-chains, distribution networks and resultant food deserts.
- Mapping should usher in the formulation of a Local Physical Land-Use Plan for each of the market centres allocating appropriate and sufficient space for periodic farmers markets to ensure sustainable use of land, implementation frameworks, development control and substantial increase in land value.
  - Site-planning of individual markets would enhance the value and usability of each market for optimisation of the intended purpose. This would include: Pedestrianizing streets within the market centres for efficiency and ease of access; spatial design for human comfort, user friendliness and environmental consideration; design for public amenities, shared resources and mixed uses; design for spatial consideration of special ergonomics as in the case of livestock and carts; envisioning room for expansion; planning for sustainable growth of the interconnected markets as a network of collective economic dependence and development based on the concept of periodicity.
  - The County should facilitate the socio-economic empowerment of actors at various stages of the supply-chain to reduce the parasitic involvement of middlemen in food and livestock trade for the benefit and efficient exchange for both producers and consumers mainly through strong cooperative societies.
  - Establishment of agro-industries especially for livestock products could enhance production, employment and improve the local economy.

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### Medium and Long-Term

- The establishment of market committees comprising business operators, administration officials from the national and county governments, residents and resident physical planners. These committees will oversee the planning, management and development control matters to ensure sustainable town growth and prudent utilisation of the land set aside for market expansion.

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