

Gender Roles and Labor Dynamics in Household Composting Practices in Ndeiya, Kiambu County, Kenya

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ABSTRACT

Composting is an agroecological practice that is commonly adopted by small-scale farmers in different food systems. It not only aided in reduced reliance on chemical inputs, in improving soil health but also in waste management within households. The division of labor and task allocation for household members in the composting process was however often accompanied by traditional gender norms. This resulted in unequal distribution of roles and imbalanced agricultural productivity as a ripple effect. This study examined the gender roles and labor dynamics in household composting practices among small-scale farmers who adopted compost manure in Ndeiya, Kiambu County, Kenya. This research used key informant interviews, focus group discussions, and questionnaires to identify: specific gender-related responsibilities in composting activities; challenges associated with these roles; and implications for gender equity and agricultural productivity. The findings of this study indicated that men were more involved in physically demanding tasks like turning large compost heaps and pushing wheelbarrows carrying compost manure to the farm. In the same vein, women were overburdened with tasks that demanded much of their time, such as gathering raw materials and daily compost management. The cumulative workload on women often led to reduced efficiency in the composting process and, by extension, impacted soil quality and crop yield negatively. These roles also not only reflected but also reinforced gender inequities in household and agricultural labor. This highlighted the need for equitable labor distribution at the household level.

Keywords: Gender Roles, Agroecology, Gender Division of Labor, Composting, Gender Equity

INTRODUCTION

In agricultural production, the gender division of labor fluctuated according to the size of the farmland, the farming system, household wealth, and the technology adopted. Women lacked technical support that could enhance efficiency in the composting process (Ogolla *et al.*, 2022; Waweru *et al.*, 2023). On average, women made up 43% labor force in agriculture worldwide. They offered unremunerated labor on family farms and as paid/ unpaid workers on other farms, engaging in both crop and livestock production. Compared to men, women farmers were more likely to engage in subsistence farming rather than commercial farming (Ingabire *et al.*, 2018).

Globally, food systems encountered uncalled-for challenges which included but were not limited to climate change, soil degradation, unsustainable agricultural practices, and loss of biodiversity. Since food is a crucial subject worldwide, all aspects of how it is produced, processed, distributed, and accessed are increasingly coming under sharp and serious scrutiny.

These issues threatened food security and required transformative approaches to achieve sustainable and resilient food systems. Therefore, agroecology as one of the transformative approaches was presented as a solution to transforming food systems.

Over the years, agroecology as a broad impression gained prominence in the fields of agriculture, politics, and science. It was championed as being able to promote agricultural practices that were environmentally sustainable and socially just (Brym & Reeve, 2016). This was by applying ecological principles to agriculture and ensuring the regenerative use of natural resources (Nicolétis *et al.*, 2019). Agroecology aligned with and was anchored on its thirteen principles which were; recycling, input reduction, soil health, animal health, biodiversity, synergy, economic diversification, co-creation of knowledge, social values and diets, fairness, connectivity, land and natural resource governance and participation (Wezel *et al.*, 2020). Composting as one of agroecology's practices was a critical practice in smallholder agriculture, often offering an affordable, eco-friendly method to manage organic waste and improve soil fertility (Paracchini *et al.*, 2020).

In Ndeiya, Kiambu County, Kenya, the adoption and effective application of compost manure mirrored entrenched social norms regarding the gender division of labor within households in the composting process (Mapedza, 2024). This study focused on understanding the distinct gender-related responsibilities in composting activities, challenges associated with these roles, and implications for gender equity and agricultural productivity.

METHODOLOGY

The data was collected in Kiambu County, which is one of the 47 counties in Kenya. The capital of Kiambu County was Kiambu town with Ruiru Constituency being its largest town. The county had an area of 8,169.8 square kilometers and was divided into twelve constituencies namely; Limuru, Gatundu North, Gatundu South, Juja, Thika Town, Githunguri, Kiambu, Lari, Kikuyu, Kiambaa, Kabete, and Ruiru. The county's population was 2,417,735 according to the 2019 census. The area was purposively selected because the agroecology project was being implemented at Limuru Constituency, Ndeiya Ward. The host center for the agroecology initiative was the Community Sustainable Agriculture and Healthy Environment Program (CSHEP) in Ndeiya ward. CSHEP was a registered Community Based Organization that worked with small-scale farmers to build food security and generate capital in agroforestry.

A mixed-method approach was employed to investigate the gender roles and labor dynamics in household composting practices. Different categories of small-scale farmers made up the study's target population. The study population mainly targeted small-scale farmers who used compost manure aged 20 to 35 years (youths) and 35 to 65 years (women and men). The study focused on both probability and non-probability sampling methods to select a sample consisting of different categories of women, men, young women, and young men farmers. The sample size was determined following Bartlett *et al.* (2001) formula:

$$N_0 = \frac{p \cdot q \cdot Z^2}{e^2} \quad (1)$$

Where;

N_0 = the required sample size

p = the estimated proportion of an attribute that is present in the population (0.3)

$q = 1-p$, e = is the level of precision,

Z = the standard normal deviation at 95% confidence level (1.96).

E = desired level of precision (0.05)

$$the N_0 = \frac{(0.3) \cdot (1 - 0.3) \cdot 1.96^2}{0.05^2} = 262 \tag{2}$$

This sample size (262) was reduced slightly since the population size was small using the following formula. This is because a given sample size provided proportionately more information for a small population than for a large population. Where N was the number of active farmers in the study area.

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$N_0=262$

$N=800$

This gave a sample size of 183 farmers.

Table 1

Men	Ratio selected	Women	Ratio selected	Young women	Ratio selected	Young men	Ratio selected
400/800x183	92	300/800x183	69	50/800x183	11	50/800x183	11

Qualitative data were collected through key informant interviews, and focus group discussions while quantitative data were collected using questionnaires on composting activities. A total of 32 participants were involved in the FGDs. Therefore, there were 4 FGDs (one comprising 8 women, another one 8 men, 8 young women, and 8 young men). 2 key informants were interviewed based on their involvement with farmers in different activities around agriculture and their vast knowledge and experience in sustainable agriculture. Interview questions focused on task allocation, time spent on composting activities, and perceived challenges. Ethical considerations were followed and ethical approval for the research was obtained from the NACOSTI body, in Kenya. Data were checked, cleaned, and analyzed using Statistical Package for Social Sciences (SPSS) version 29.

RESULTS

The results revealed clear gender-based differences in composting tasks. Women predominantly handled routine tasks such as organic waste collection, sorting, and maintaining optimal compost moisture, which required frequent attention and consistency. These roles were generally time-consuming, with women reporting significant overlap between composting duties and other domestic responsibilities. In contrast, in the composting process, men were more likely to engage in activities such as compost pile turning and the transportation of finished compost, activities that demanded more physical strength but were typically less time-intensive. The following sentiment was captured in an FGD of men (35 years and above) who had the following to say; in the composting process, there are specific activities and roles attached to either women or men based on their strength, ability, and knowledge. (FGD; 03/08/2024).

The study also identified challenges linked to this division of labor. Women reported experiencing time constraints and physical fatigue due to their dual responsibilities of composting and household chores. Men, while engaged in fewer composting tasks, indicated that their involvement was often limited by other agricultural duties, leading to delays in physically demanding tasks, which can affect compost quality and efficiency.

Table 2: Roles of women, men, young women, and young men in the composting process

	Older women		Older men		Female youth		Male youth	
	frequency	%	frequency	%	frequency	%	frequency	%
Digging the compost pit	12	6.4%	20	10.7%	9	4.8%	43	23.0%
Burying compost	16	8.6%	20	10.7%	11	5.9%	39	20.9%
Looking for water	99	52.9%	25	13.4%	86	46.0%	40	21.4%
Looking for twigs or grass	123	65.8%	59	31.6%	88	47.1%	59	31.6%
Turning the compost manure occasionally	76	40.6%	114	61.0%	54	28.9%	122	65.2%
Constantly adding water	98	52.4%	67	35.8%	60	32.1%	65	34.8%
Checking the temperature	92	49.2%	83	44.4%	33	17.6%	56	29.9%
Carrying the compost to the farm	107	57.2%	120	64.2%	144	77.0%	168	89.8%

DISCUSSION

The findings above indicated that labor divisions not only reflected but also reinforced gender inequities in household and agricultural labor. The results were in line with Oduro *et al.*, 2022 who noted that women in the composting process often engaged in raw materials collection, sorting, and routine compost maintenance. Men on the other hand were assigned tasks that involved more physical strength, such as huge compost manure pile turning or transporting finished compost using wheelbarrows or shoulders. The cumulative workload on women often resulted in reduced efficiency in the composting process and, by extension, impacted soil quality and crop yield (Zerssa *et al.*, 2021). For instance, consistency in compost production and application among women was affected due to less time affecting the quality of the compost manure.

The study's findings highlighted the need for more equitable task allocation and support for women in composting activities. Interventions such as composting training programs that included both men and women and the introduction of low-cost, labor-saving composting tools could alleviate some of the physical and time burdens experienced by women. Encouraging shared responsibilities between men and women in composting tasks may lead to improved productivity and a more balanced household workload. Introduction of the "family farming approach" could also help reduce the labor burden on women as agricultural labor is divided among all household members (Suess *et al.*, 2016).

Intersectional gender differentials in people's behavioral change towards agroecology continued to pose great interest to researchers and policymakers around Sub-Saharan Africa and the world at large. Addressing

intersectional gender differentials in agroecology is predicted to achieve sustainable development in the long run. This is by increasing agricultural productivity, reducing poverty and hunger, promoting gender equity in agriculture, and promoting economic growth. The main proposition underlying this interest is that the contributions and efforts of women farmers in particular have been ignored in agriculture and agroecology (Zaremba *et al.*, 2021).

CONCLUSION

The findings of this study underscored the need for a more equitable division of labor in the composting process to improve both household productivity and gender equity in rural settings. Reassessing task allocation, providing targeted support, and promoting shared responsibilities in composting may address some of the significant challenges associated with gendered labor roles in Ndeiya. Addressing these disparities by promoting more equitable labor practices and supporting women in composting could enhance the efficiency of household composting and promote gender equity in rural agricultural communities. Future studies could expand on these findings by exploring labor-saving technologies and interventions tailored to rural composting.

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