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Does Gender Matter in Agro-Food Manufacturing Sector? Perceptions of Micro and Small Scale Food Processors in Kenya

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Abstract: This article is motivated by manufacturing and food security as critical components of the Big Four Agenda guiding development by Kenyan government today. However, gender asymmetry in the two sectors seems to frustrate the desired achievements. The research question "Does gender influence processing of advantageous food products among micro and small enterprises in Kenya?" guides the study. To answer this question, the study adopts a mix of constructivism and Longwe framework to survey micro and small food manufacturing enterprises registered in county governments of Busia and Nairobi, Kenya. Data was collected using both primary through interviews and literature review through refereed journals, reports and books. The enterprises are sampled by fisher sampling techniques in Nairobi and snowballing in Busia. The heads of the enterprises are interviewed by drop and pick semi structured questionnaires. The structured part is on a seven-point likert scale. Out of 132 entrepreneurs interviewed, 130 correctly filled the questionnaires that were analyzed using descriptive and inferential techniques. Explanatory study design was applied by both Pearson's Correlation and Logit regression to determine the effect of gender on manufacturing advantageous foods in Kenya. Results showed more men-owned food processing enterprises than women-owned. There was results also an inverse correlation between gender and manufacturing advantageous food products. However, there is not enough evidence to demonstrate that gender significantly influence manufacture of advantageous food products (Wald (1) = 1.339, p= 0 .247, sig < .05, 2 tailed). However, attitudes indicating gender inequality among micro and small food processing entrepreneurs are still existent. The study recommends diffusion of gender equality norms by international and regional actors in developing countries. Thus, National and county governments of Kenya should mainstream gender in food processing policies and programs. Further studies should be conducted to determine the effect of gender on other manufacturing sectors in Kenya. Other related studies could be done on the age of women, marital status and parity on food processing sector.

Keywords: Gender, Micro and Small Agro-Food Processing, Advantageous Food Products.

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Background of the Study

Everyday 925 million people, sleep hungry globally despite gender analysis showing that women are able to feed the world (Oxfarm GB, 2012). This bitter irony is a reflection of gender inequality in food value chain. Achieving food insecurity today and in future requires deliberate evaluation and remodeling of the current agricultural value chain

models currently driven by gender inequalities. Processing of food is a critical phase in food value chain that makes food reach people in right quantity and quality at all times. This phase of food value chain suffers competitive vulnerabilities because of gender asymmetry grounded on culture and traditions. Gender in food value chain refers to socially and culturally constructed roles assigned to women and men on the basis of their sex in agricultural sector, from farm to plate. It defines behavioral relationships between the two sexes as well as economic roles they play at household, community and national level in food production, processing and marketing. Connell (2005) observed multidimensionality in gender inequalities experienced; ranging from owning economic assets, cultural authorities to interpersonal and personal emotions. The antithesis of gender inequality is gender equality which is an ideal international norm enjoying supports of many states currently.

Gender equality in food-processing implies inclusion and full involvement of men and in value addition and manufacturing phase of food value chain. The struggle to realize gender equality can be traced first from *Universal Declaration of Human Rights* in 1948 and later on between 1975 and 1985 which became the UN Decade of Women that globalized feminism. Gender equality also found prominent focus in the *International Covenant on Economic and Cultural Rights* (ICESCR) in 1976. The covenant yielded a gender sensitive framework lased with indicators to guide party states to realize gender equality in economic, social, cultural and work-related environment. Gender equality also found support in the *Convention on the Elimination of All Forms of Discrimination against Women* (CEDAW). CEDAW recognized discrimination against women as an obstacle between women and their participation in political, social, economic and cultural life of their countries, societies, families and their own development. The convention pushed party states to condemn all forms of discrimination and violence against women. In 1995 the world converged in Beijing, China and agreed to promote women participation in all spheres on equal pedestal with men.

Besides international framework, gender equality has found backing regionally. Between 1990 and 2000 the European Union (EU) put more focus on gender equality among member states. In the move towards equal society, EU diffused gender equality among its members and beyond on three fields: work/family reconciliation, equal opportunities and social policies (Lewis, 2006). Studies on emergent gender regimes reported a lot of success by EU due to its growing polity and deepened

power presence over states throughout the world and various policy domains (Walby, 2004). In Africa, the *African Charter on Human and People's Rights*, *Protocol to the African Charter on Human and People's Rights* (the Maputo Protocol) and *Declaration on Gender Equality in Africa* all recognize the adverse effect of gender inequality. The treaties push party states to combat gender inequality through effective legislative, policy and standards that would guarantee women full participation in the development agenda. Kenya has adopted most of these international and regional norms on gender through its *Kenya Constitution 2010*, *Kenya Vision 2030* and various legislative frameworks. However, gender equality is yet to be realized in Kenya (Gicheru, 2013).

Women participation has significantly increased since 1980s, particularly in production phase of agriculture which is a major player in the Keya economy. However household chores and cultural norms have restricted their full participation at value-addition phase and ultimate benefits (World Bank, 2009). Gender differences in various phases of food value chain arise from productive and reproductive roles of male and female persons in a community. Gicheru (2013) described the Kenyan agriculture as having gender disparities in access to economic resources, technologies, services and inputs. The landscape favored men to women. Thus women were mostly farm laborers who owned no land. On market end, they had low membership in marketing cooperatives and engaged mostly in sale of fresh and highly perishable farm produce.

In advent of globalization, climate change, food security and stiff competition from free trade markets; food manufacturing has become an important phase and constituency of agricultural value chain. Food processing must be gender inclusive and technologically enhanced to produce high quantity, quality and value added products that can face hi-tech food commodities from overseas. Once this is done a country would be on the right path to food security, creating more jobs and meaningful incomes for small holder farmers.

Research Problem

Does being male or female affect processing of advantageous food products? Despite women being excluded in critical phases of food value chain, no studies have demonstrated whether or not gender determined competitiveness in food processing in Kenya. It is this gap that the study seeks to address. Focusing on gender issues in food processing does not only address equality between men and women in

the industry, but also fixes the structural changes aimed at reducing food insecurity and poverty. The desired state of food security, where all people have access to right quality and quantity of food demand that both men and women participate in all phases of food value chains. However, this is not the reality in most parts of the world. For example, technologies fabricated for food value-addition generally favour masculine tasks (World Bank, 2009). This disparity makes women benefit dismally from agricultural labour and ineffective in addressing starvation, unemployment and poverty in Kenya (Gicheru, 2013). By addressing this problem, the study contributes immensely to improvement of manufacturing sector in agriculture. This resonates to the country's clarion call to create jobs through revival of manufacturing sector and increasing food security in *the Big Four Agenda* and *Kenya Vision 2030.*

Research Objective, Question and Hypothesis

The study investigated the influence of gender on processing advantageous food products among micro and small enterprises in Kenya. To enhance the rigor and specificity of the study, the objective is transformed into question and hypothesis.

- Does gender influence processing of advantageous food products among micro and small enterprises in Kenya?
- H_0: Gender has no significant influences on processing of advantageous food products among micro and small enterprises in Kenya.

Literature Review

In order to allow theory and data collection to inform each other (Lewis & Nicholls, 2014), the study incorporated review of existing literature on gender and agricultural value chain focusing on gender empowerment frameworks and evidence that shed light and built into answering the research question. The areas of focus were: gender, processing of advantageous food products, theoretical and conceptual frameworks that anchored the study.

Theoretical Framework

This study adopted a mix of constructivism and Longwe frameworks to answer the research question. Constructivist framework looked into gender as a socio-cultural construct and norm that could be changed, diffused and adopted by various social systems. Various institutions of power and influence such as United Nations (UN), regional bodies such

as EU, East African Community (EAC) and states can force diffusion and adoption of these international norms in local social, interpersonal and individual contexts (Krook & Irue, 2010). One of these constructivist frameworks that successfully empowered women in Africa is Longwe. Longwe framework is a tool developed by Sara Hlupekile Longwe in Lusaka, Zambia. It guided planners in increasing gender equality and women empowerment; taking equal place as their men counterparts in development and control of factors of production (March, Smyth, & Mukhopadhyay, 1999). According to the framework, poverty was a consequence of women oppression and exploitation and not lack of production. And that the escape route out of poverty was developing people; making them take charge of their own lives to escape from poverty (Anant, 2016). Longwe framework suggested five trajectories through which the social construction could be effectively delivered. These include welfare, access, conscientisation, participation and control. Welfare referred to women in food proceeding accessing material livelihood resources e.g. food, income and healthcare. Access meant that women reached and used factors of production as men did. It implied access to land, labour, credit, training and marketing facilities. Concientisation, on the other hand, was about making men and women realize that women lacked access to land, labour, capital, entrepreneurship and technology

This study adopts Longwe framework to enhance results to the research question because of being African and widely accepted as an empowerment tool for women in a situation of discriminatory practices and rules that oppressed women (Longwe, 2002). Gender as a cultural construct, could be changed and work be fairly and agreeably be assigned to both sexes. No sex should be rendered a lesser being either economically or politically. The theory advocated for women mobilization into grouping to fight for their emancipation. This would enable them to meaningfully be involved in all phases of food value chain, that is; decision making, policy making, planning, implementation and evaluation. Finally, control related to equal authority over the factors of production and distribution of benefits from the food value chain.

a) Empirical Review

Globally women are recognized as critical players in food production; producing 50% of the foods. However, they encounter gender specific barriers such as lack of effective technologies, credit for processing and their incomes are culturally meant for family survival with little economic value. A study on Canadian farm women revealed that

though women played critical role in agriculture, poverty is still feminized. Canadian farm women disproportionately accessed education, credit and income compared to men (Roppel, Desmarais, & Martz, 2006). In west Asia, Lebanese women encountered gender specific barriers such as land ownership, credit access and women unfocussed extension programs (United Nations, 2001). While in Andean region and Latin America cultural, economic and social conditions enlarged developmental inequalities between women and men. More women are part of poor households with most of them having no income and those who were employed earned relatively lower than their men counterparts. In 2011, women in Peru received 75% of the men's wage while in Bolivia and Ecuador, it was at 80% and 96% respectively (Polar, Babini, & Flores, 2015).

Longwe (2002) found discrimination against women in developing countries an enormous problem which in sub-Saharan Africa is exacerbated by patriarchic ideologies engrained in cultural practices and norms whose custodians were men. This, she explains, gives men priority over control and access to factors of production. Gender issues have been overlooked and persistent gender inequalities obstruct women to progress (Spence, 2010).

b) Processing Advantageous Food Products

Food processing is the changing of raw agriculturally-based inputs into finished human food products. Processing of food is the next frontier and demand-end strategy meant to industrialize agriculture. It reduces post-harvest pilferage and improves food quality and shelf life of food commodities as well as widening the distribution area. The sector has transformed lives economically by creating employment and increasing incomes for farmers (Rottger & Da Silva, 2007). In France, the Netherlands, Poland and UK, this sector developed towns and enhanced spatial distribution of economic transactions and wealth (Leeuwen, 2007). In Taiwan, food processing was employed to address bad effects of international free trade phenomenon and stiff competition from foreign food commodities (Council of Agriculture, 2002). While in India, the food processing sector grew by 8.4%. The sector has transformed India to be one of the largest food exporters globally. Consequently, the government of India has embarked on improving the food processing industry so as to curb food wastage through establishing mega food parks, widespread agri-modernisation initiatives and drawing food maps for processing and exportation (The Swedish Trade and Invest Council, 2015).

Since 1970s, Micro and Small Enterprises(MSEs) also known as *Jua Kali* sector have received a lot of focus in Kenya as fast creators of skills, employment and source of livelihoods for both urban and rural populations. The sector contributed 76.5% of jobs, according to the *Government of Kenya Economic Survey, 2005*. Women-owned MSEs were about 612,848; accounting for 47.4% of the entire *Jua Kali* sector (International Labour Organisation, 2008). The sector permeated agriculture in form of small scale production and agro-processing. Though agro-processing is gaining fast growth, it is dominated by foreign multinationals with focus on oil, fruits, soft drinks, beer, dairy, meat and cereal processing (Oloo, 2010). This exposed micro, small and indigenous entrepreneurs to competitive vulnerabilities. At manufacturing level, only 6.6% of the employed people were women earning an average of KES 4,344 per month compared to KES 7,627 earned by men (ILO, 2008). Gender-lensed studies in *jua kali* sector further revealed that women-owned enterprises faced capital and regulatory obstacles (Naituli, Wegulo, & Kaimenyi, 2006). In agro-processing, women-owned enterprises in Kenya lacked access to appropriate technologies, entrepreneurial trainings and marketing (Muluku-Mutuku, Ali-Olubandwa, & Odero-Wanga, 2006). These glaring gender disparities in manufacturing and the recent call by Kenya government to focus on food security and manufacturing forms the basis for the need to address integration of woman in food processing.

c) Conceptual Framework

Conceptual framework is a diagram showing processes, concepts and how they relate. In an orderly manner, it indicates causative and resultant key issues in the problem; hence giving a concrete and clear mental picture of the whole study (Mvumbi & Ngumbi, 2015). In this context, the diagram depicting key concepts of the study and how they relate is as shown in fig.1 below.

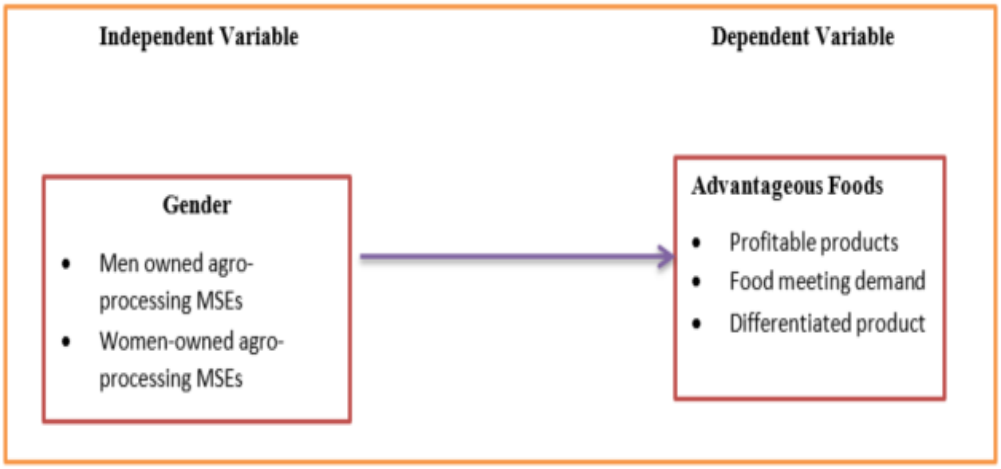

Fig.1: Gender and Processing Advantageous Food Conceptual Framework

Source: Author, 2018

Fig. 1 above shows key variables that the study examined namely; gender of entrepreneurs and advantageous products among micro and small food processing sector. Gender is binomial; that is the entrepreneurs are either male or female. Advantageous foods are characterized by increasing income (profitability), meeting market demand and being differentiated. The study sought to demonstrate whether being a male or female accounted for variance in the manufacturing of profitable, demand-focused and unique products among micro and small food processors.

Research Design and Methodology

This study adopted explanatory design to investigate the extent to which gender (control variable) caused variance in processing of advantageous food products (predictor variable). The design uses Pearson's product moment correlation to explain the relationships (Heppner, Wampold, & Kivlighan, 2008). It further uses logit regression to account for change in dependent variable caused by independent variable. The study sampled micro and small scale entrepreneurs involved in processing foods using a sample frame from the lists of permitted firms by County Governments of Busia and Nairobi. Due to poor data record, snowballing was used in Busia. Nairobi had enough data. Therefore, fisher sampling was used. A total of 188 entrepreneurs were sampled, but 132(70.2%) returned the filled questionnaires for analysis.

Data was collected using semi-structured questionnaires. The structured part was spread on a 7-point Likert scale. The questionnaire was piloted in Kisumu County. Validity and internal consistency of constructs in the questionnaire was tested using Cronbach's Alpa test to show how items in a set are closely related (Molla & Bissdoff, 2012). The study processed 31 cases, n=23(74.2%) of which were found valid. A Cronbach's alpha reliability statistics of 0.97 was gotten indicating excellent reliability of the instrument and the scale used for it.

After collection, data was summarized and analyzed using an amalgam of descriptive and inferential techniques because of their ability to trade off the weaknesses and strengthen of each other. Descriptive technique made sense out of data collected by summarizing it into central tendencies, dispersion, means, variances and frequencies. Inferential statistics employed Pearson correlation and binomial logistic regression analysis to determine the relationship between gender and processing advantageous food products in micro and small scale enterprises. Whereas Pearson correlation determined the nature and strength of relationship, binomial Logistic Regression (Logit) model showed the contributory variance in processing advantageous foods caused by gender. Logit also indicated the Pseudo R^2 that aided in establishing the fitness of the model. The equation of Binomial Logistic Regression was expressed as:

$$\mathbf{Log[p/(1-p)] = b_0 + b_1X_1 + \varepsilon}$$

Where:

p = the probability that the advantageous product is high, p(Y=1)

p/(1-p) = the "odds ratio"

X_1 = being women-owned or man-owned

e = stochastic error

Hypothesis testing followed to measure the reasonableness of the claim. A procedure of four steps was followed. The steps included: stating the hypothesis in an alternative format; setting the criterion or level of significance of judging the claim (α to be 0.05 or $p < 0.05$ as a criterion of its judgment); deciding the nature on sampling distribution of the test statistics if the hypothesis is true; and deciding on accepting or rejecting the hypothesis based on the set criterion (Myers, Well, & Lorch, 2010).

Finally, the study determined the fitness of the model. It adopted Cox and Snell R Square and Nagelkerke R Square because scholars advised that more than one test are important in establishing goodness-of-fit to enhance each others accuracy (Hooper, Coughlan, & Mullan, 2008).

Findings and Discussions

(a) Gender in food processing industry

The study examined effect of gender on performance of Kenyan agro-food processors. Kenya has had a long-standing cultural traditions and subjective social norms that defined gender roles which also influenced perceptions of the two sexes on using current technology for producing advantageous products. The survey results showed that most of the MSEs n=87, (65.9%) were men-owned with only n=43, (32.6%) women-owned. The results showed gender disparity in food processing sector. Muluku-Mutuku, et al (2000) observed similar findings during their study. Elsewhere Longwe (2002) attributed the low participation of women in micro and small food processing to existing socio-cultural obstacles. The observed gender divide in food processing could potentially imply that women were technology averse which is not the case. They perceived themselves with low esteem; that food processing was a reserve for men. It could also mean that the technology employed for processing foods was masculine in design and meant for men role (World Bank, 2009). The overall implications are that women in Kenya have missed out on economic opportunities that food processing sector unveils. The opportunities include skills development, employment, increased incomes for women and enhanced capabilities to counter stiff competition from overseas products (Leeuwen, 2007; Rottger & Da Silva, 2007).

(b) Advantageous food processing in Kenya

Advantageous food is defined by profitability, meeting market demand and uniqueness. These cues gave food products comparative advantage over rival products at the marketplace. The micro and small agro-food manufacturers interviewed agreed that on average n=130(98.5%) of their products were advantageous. The self-perception implies that the entrepreneurs were conscious of making products that would face globalization challenges of free trade and hi-tech products competition at the same time addressing nutritional needs of the market. The study responses resonate well with the report that predicted survivability of indigenous processing enterprises on making of profitable, market-focused and unique products (Council of Agriculture, 2002).

(c) Gender and food processing relationship

After determining gender and advantageous food processing, the study embarked on evaluating the relationship between the two variables. The study adopted Pearson correlation and logit regression techniques to measure the relationships. Pearson correlation examined the relationship between the criterion variable (processing advantageous product – Y) and the predictor variable (gender – x variable) as indicated in table 1 below

d) Table 1: Gender -Advantageous Product Pearson's Correlation

Correlations			
		Sex	Advantageous product
Your gender	Pearson Correlation	1	-.110
	Sig. (2-tailed)		.214
	N	130	130
Advantageous product	Pearson Correlation	-.110	1
	Sig. (2-tailed)	.214	
	N	130	132

Source: Author's Survey Data, 2016

Table1 shows that 130 responses were successfully analyzed using the Pearson's correlation technique and results showed a weak inverse (r = -0.110) relationship between gender and the advantageous food processing. The self-reporting responses indicate a slight gender bias in agro-food processing, favoring men (coded 1) to women (coded 0). This also meant that about 1.2 % (0.11^2) was the variance shared between the two variables. In other words, gender accounted for only 1.2% of the variance (0.11^2) in processing advantageous food products.

Further logistic regression was employed to predict advantageous products using gender using dichotomous data. Therefore, the responses that were generated as ordinal data on a 7 point Likert scale were transformed into binary or dichotomous data; that is 0 or 1. The values were expressed as indices of each respondent's highest score divided by the maximum expected score. All values below 0.5 were

considered 0 and all values above 0.5 were considered 1. A simple regression was run using SPSS and table 2 below was generated.

g) Table 2: Gender - Product Wald Test

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	A2sex	-1.434	1.239	1.339	1	.247	.238
	Constant	5.888	2.138	7.585	1	.006	360.780

a. Variable(s) entered on step 1: A2sex.

Source: Researcher, 2016

The aims of regression analysis were: to describe the way in which processing of advantageous food product varied with gender among *jua kali* manufacturers and test the hypothesis. Regarding accounting for change in advantageous product processing the study put the variables into a model equation for easy interpretation as below shown.

Log [p/(1-p)] = 5.888 - 1.434X_1+ 1.239

According to the results in table 2, unit increase in gender roles accounted for a decrease in processing advantageous products by 1.434. The study also showed that if gender variable was rated 0, processing advantageous product would increase by 5.888.

Next was testing of hypothesis. The hypothesis to be tested was: H_0: gender *did not significantly influence the processing of advantageous food products in Kenya.* The table 2 results show *(Wald (1) = 1.339, p= 0 .247, sig > .05, 2 tailed)* at confidence level of 95% or P-value of 0.05 significance levels. The P value (0.247) is greater than the sig. value (0.05). The null hypothesis is upheld thus gender did not significantly influence the processing of advantageous food product among the MSEs in Kenya. There was hardly enough evidence to warrant significant influence on making advantageous foods by gender among micro and small agro-food processors. In other words, women and men had equal capabilities in processing advantageous foods. Roppel, Desmarais and Martz (2006) found similar findings among farm women in Canada and all gender covenants have upheld this to fact.

Despite the fact that gender did not cause significant influence on processing highly competitive food commodities in Kenya, the entrepreneurs (both men and women) in the *juakali* sector harbored an

attitude and perception that favored men. According to many studies these feelings have permeated into individuals, societies and institutions, mostly in developing nations and have cost women progress and sustainable development (Polar, Babini, & Flores, 2015; Gicheru, 2013; Spence, 2010). To correct these perceptions in all phases of food value chain, Roppel, Desmarais and Martz (2006) observed that it is not a matter of chance but rather that governments, regional inistitutions and development partners must take a lead in developing and diffusing mission oriented policies that are inclusive and more market-oriented to mainstream gender in food processing. In Latin America and Caribbean, mainstreaming gender, led to 11% drop in maternal deaths, drop in poverty and increased food security and environmental sustainability between the year 2000 and 2010 (Polar, Babini, & Flores, 2015).

After hypothesis testing, the study finds out the reasonableness of the claim. This is done using likelihood estimates and pseudo R square tests as shown in table 3 below.

f) Table 3: Model Fit Test Results

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	27.098[a]	.011	.056

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Source: Researcher, 2016

Maximum likelihood estimation (MLE) estimates the model fitness using the coefficients. The likelihood function (L) measures the probability of observing the particular set of highly advantageous product values in the sample. The higher the likelihood function, the higher the probability of observing the highly advantageous products in the sample. MLE involves finding the coeffients (***a***, ***B***) that made -2 times the log of the likelihood function (-2LL) as 27.098 as shown in table 3. The Cox and Snell Pseudo R^2 formula estimates the proportion of variance in advantageous product processing accounted for by gender

predictor, the strength of association between gender and the advantageous product variables and if the model fitted the data based on log-likelihood. Because $R^2_{C\&S}$ could not reach a maximum of 1, statistics from the $R^2_{Nagelkerke}$ was applied to adjust for the realization of the maximum value. Based on the model, variation in the highly advantageous products ranged from 1.1% to 5.6%, depending on whether the Cox & Snell R^2 reference or Nagelkerke R^2 methods, respectively. The model fits the data because it has met the requirements of goodness of fit which is between Likelihood Ratio Index (LRI) of 0(model with no predictive value) and 1(model with a perfect fit).

Conclusion

To improve the state of food and manufacturing in Kenya, focus should be on women rights and their empowerment to close the gender gap. This is because this study has shown that both female and male agro-food processors have equal potential to manufacture advantageous foods that meet market demand and compete globally. However traditionally and culturally driven attitudes and practices still stifle women's participation at food processing phase. Efforts need to be enhanced to challenge cultural values that affect these two agenda. It is important, therefore, to bring women on board in food processing to exponentially enhance food security. For this to happen, reconstruction of individual and community mindsets is paramount. Regional institutions, states and development agencies must champion women empowerment. Specifically, the study suggests the following policy and practical interventions.

Policy interventions

1. Regional bodies like European Union (EU) and East African Community (EAC) with stronger infrastructure, polity and influence should cause diffusion and adoption of gender equality among states, especially in food value chain.
2. The two levels of government should create legal framework that mainstream gender in all phases food value chain.

Practical Interventions

1. The national and county governments through agriculture and industrialisation department should keep data of all food processing enterprises disaggregated by gender and size.
2. The governments should improve food processing sector through developing mega food parks and draw food maps for processing and marketing for export market.

3. The governments, nongovernmental organisations and private sector should provide credit and trainings targeting women in food processing.
4. The governments, nongovernmental organisations and private sector should mobilise women into welfare groups to conscientise the society on importance of gender balance in food value chain and participation in development.
5. Fabricators should come up with technologies that handle female tasks in the food processing industry.

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