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Analysis of the Alcoholic Drinks Control Act, 2010 in Reconciling Chang'aa Distillation with Climate Change in Vihiga County, Kenya

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Abstract:

Non-commercial Alcoholic production predates history and influence global religious, socio-cultural and economic realms of life. It largely includes chang'aa in Kenya and accounts for social violence but its effect on pollution and climate change is least explored. The Alcoholic Drinks Control Act, 2010, initiative to manage chang'aa distillation in Kenya had achieved little. This paper posits that the Alcoholic Drinks Control Act, 2010 could help reconcile chang'aa distillation with climate change in Vihiga County, Kenya. Specific objectives to the study were to establish the: pollutants released during chang'aa distillation; relationships between chang'aa distillation and pollution; influence of chang'aa distillation on pollution and; the relationship between chang'aa distillation and enforcement of the Alcoholic Control Act, 2010. A questionnaire and digital camera administered to a sample of 100 snowballed chang'aa distillers provided primary data, complemented with secondary data. Person's correlation and logistic regression were used to analyse data. Results reveal that Carbon dioxide (38%) and plastics (29%) were most notorious waste generated and disclose a moderate positive (0.410 at P<0.05 level) relationship between chang'aa distillation and pollution. Besides, Binary logistic regression model reveal that chang'aa distillation accounted for 93.56% (at P<0.01 level) pollution at the distillation venues. Finally, Pearson's correlation reports a weak negative (-0.191** at P<0.01 level) relationship between the enforcement of the Alcoholic Control Act, 2009 and chang'aa distillation. It was concluded that chang'aa distillation oriented pollutants exacerbated climate change hence the Act should be restructured to harmonise chang'aa distillation and climate change.*

Keywords: Control Act, Chang'aa, Pollution, Climate change.

1. Background to the Study

Non-commercial Alcoholic includes licit and illicit home-produced or smuggled traditional, counterfeit or illegally produced drinks for personal consumption or sale worldwide (ICAP, 1995). It accounts for a significant portion of world Alcoholic distillation that evades taxation and government regulation. In Kenya and particular Vihiga County chang'aa (literal meaning "kill me quick") which until 2010 was an illegal traditional brew is a popular Alcoholic drink. It presents serious social-economic and health problems due to the irresponsible drinking patterns/habits but enjoys cultural patronage in the County. Its harmful effects probably accrued mainly from restrictive government policies that lacked the capacity to control it. Introduction of the Alcoholic Control Act, 2010 in Kenya was to sanitize its distillation, improve human welfare and defuse related environmental effects like climate change had achieved little.

2. Problem Statement and Justification

Non-commercial Alcoholic distillation is lucrative (Grant, 1998) and cultural centrepiece (Heath, 2000) in the world. Consequently, the formerly culture driven chang'aa distillation exercise helps women to support their families (Nordlund & Österberg, 2000) in Vihiga district. However, it was dominated by unfettered untaxed counterfeit and illicit drinks obscure its importance (Hauge &

Amundsen, 1994) whose origin remains a mystery. This prompted the difficulty to enforce government restriction policies culminating to the Alcoholic Drinks Control Act, 2010 (ROK, 2010). Alcoholic consumption accounts for 1 in 25 deaths in Canada (CAMH, 2009) while incidents of death and blindness in Nairobi (Rowan, 2000) and murder in Emuhaya (Agwanda, 2012) were common. Numerous festivals together with increased youthful and women chang'aa drinking population had worsened the situation in the County. Also, regulating it presented a challenge health (Single, 2004) and livelihoods due to the rudimentary rehabilitation infrastructure for the chang'aa addicts. Apart from its socio-economic hiccups that have received the necessary attention, its distillation cause pollution and intensify climate change both of which are often neglected. Therefore, the Alcoholic Drinks Control Act, 2010 might sanitize chang'aa distillation process and hence mitigate its adverse effects on climate change. To date, little is known about synergies between its distillation, pollution and climate change due to difficulties involved in monitoring and evaluating the practice.

3. Literature Review

Non-commercial Alcoholic distillation dominates global Alcoholic industry (Rossow, 2003). It is enshrined in the diverse world cultures (Heath, 2000) but presents socio-economic problems aggravated by restrictive government policies. Its distillation meets required quality standards (Haworth & Simpson, 2004) as producers strive to retain market (Nuzhnyi, 2004), but quality inconsistencies (Rosovsky, 2004) and harm to health (Grant, 1998 and Ryan, 1995) dims its poor quality especially illicit and counterfeit Alcoholic that compromise quality. Traditional homemade Alcoholic includes Cachaça in Brazil, kachasu in Zambia (Haworth & Simpson, 2004) and Changa/busaa in Vihiga County. Illicit Alcoholic, dominate non-commercial Alcoholic distillation because it involves smuggling or cross-border trade (Willis, 2003) hence the global wider ready market accelerates its distillation. Counterfeit Alcoholic is packaged as legitimate commercial products (Lemmens, 2000; Room & West, 1998) to blind fold consumers. Chang'aa is made of maize flour, sorghum yeast and sugar, but the distillation process takes a period of 20 days. Unfortunately, Jet fuel has become a major component in chang'aa drunk by many urban poor in Nairobi (Exodus Kutoka Networks, 2008). This trend was on the rise because jet fuel made chang'aa stronger and was cheaper than traditional ingredients. Worse still, the higher demand by drunkards who readily needed *anything to make them high* prompted the use of formalin to shorten the chang'aa distillation period. These were propagated by *minmax* principle of profitability but further revealed that chang'aa distillation presented more environmental decay than what met the eye.

Distillation of chang'aa in Vihiga County is not only a concern to national health, security and treasury and but also to climate change. Fuel wood and containers used during its distillation and consumption pollute the environment. Fuel wood used cause deforestation (Bare and Wangwe, 2000) that simultaneously impaired the carbon sink and disturb the forest ecosystem. Consequently, the carbon dioxide released degrades ozone (Perman, 1999) while the poorly dispose plastic and metallic waste generated impede vegetation growth. All these aggravated climate change and the associated disastrous effects.

4. Methodology

Vihiga County is found in Kenya and comprises of four districts including Emuhaya, Hamisi, Vihiga and Sabatia. Given the nature and scope of chang'aa distillation industry, the population of chang'aa distillers was unknown hence snowballing was used to draw a sample of 100 chang'aa distillers studied. The survey used questionnaires and photography to collect primary data pertaining to the energy, containers, waste, noise and smell associated with chang'aa distillation. Descriptive data was tabulate. Pearson's correlation coefficient was used to establish the relationship between NCAP and pollution. Consequently, Binary Logistic regression helped estimate the effect of NCAP on pollution. Finally, the relationship between NCAP and the Alcoholic Drinks Control Act, 2010 was determined using Pearson's correlation. 0.01 and 0.05 levels of significance applied to all tests.

5. Results

A comprehensive profile of chang'aa distillers is presented in Table 1. Most of the chang'aa distillers were women (71%) of which more than 30% were male brewer who operated under the umbrella of their wives. This was mainly because the women were predominantly widowed housewife and less vulnerable to police harassment in event of arrest. Additionally, men had to organise for the release of their wives in event of arrest by paying the bond and fines as required by the law. On average of 62.5% Male and 37.5% females were employed not only in the distillation process but also surveillance that alerted the brewers of any attempt of police ambush to facilitate hiding of chang'aa and escape of the customers. The distillers were mainly the youth (59%) and middle aged people (31%) probably due to prevailing high levels of unemployment. About 200-400 litres of chang'aa were distilled weekly and approximately 65% of the distillers were arrested about 6-10 times monthly. To minimise adulteration of chang'aa by unknown persons, the chang'aa distillation took place in homes (24%). On the other hand, fear of police arrest accounted for massive chang'aa distillation in the bush (57%) and on river banks (19%). All these engendered pollution of homes, bushes, rivers and the atmosphere causing disturbance to ecosystems and accelerated climate change

Variable	Description	Counts (%)
Gender of the chang'aa distillers	Male	29 (28)
	Female	71 (71)
Age (in years) of the chang'aa distillers	15-35	59 (59)
	36-50	31 (31)
	51 and above	10 (10)
Employee of the chang'aa distillers (average)	Male	5 (62.5)
	Female	3 (37.5)
Litres of chang'aa distilled weekly	Bellow 200	35 (35)
	201-400	48 (48)
	4001 and above	17 (17)
Venue of chang'aa distillation	Home	24 (24)
	Bushes	57 (57)
	River banks	19 (19)
Number of times arrested per month	0-5	20 (20)
	6-10	65 (65)
	11-15	10 (10)
	16 and above	5 (5)

Table 1: Demographic and socio-economic characteristics of chang'aa distillers

Notes: Figures in brackets are percentages.

Chang'aa distillation was a detailed process ranging from preparation on maize, malt millet, grinding flour, fermentation, frying, distilling to packing and storage of chang'aa. In order to accomplish this task, numerous equipment, containers and ingredients were required. Figure 1 presents frying as the middle most activity that is enabled by a large frying pan measuring about one by three meters squared, a spade, cooking stones and firewood as well as labour. The hygienic conditions observed at the distillation site definitely meets required quality standards as echoed by Haworth & Simpson, (2004). It is visible from the Figure that vegetation at the frying site has been destroyed, firewood provided energy and carbon dioxide was oozing into the atmosphere through a pipe in the centre of the pan.



Figure 1: Frying fermented maize and malt millet flour

Notes: This stage comes immediately after fermentation. The frying process is on-going in a hidden bush away from the brewer's home. The researcher was helping the employees in the stirring of the fermented flour,

Source: Field data, 2013

All the identified pollutants (Table 2) not only weaken human health were also a nuisance. Principally, smoke and carbon dioxide (39%) manifests deforestation and ozone depletion. Non-biodegradable plastics (28%) and metallic containers (4%) impede vegetation growth and carbon sequestration. These jointly contributed to increased concentration of carbon dioxide in the atmosphere prompting global warming as a precursor for climate change.

Pollutants	Count (% age)
Smoke and carbondioxide	39 (39)
Plastics	28 (28)
Odour smell	13 (13)
Noise	9 (9)
Metallic containers	4 (4)
Effluents: sludge and hot water	3 (3)
Residual: Ash	3 (3)
Others: Flies	1 (1)

Table 2 : Polluants generated during chang'aa distillation
Notes: Figures in brackets are percentages.

Pearson correlation (Table 3) reveals significant moderate positive correlation 0.410* relationship between pollution and chang'aa distillation meaning that increased chang'aa distillation was associated with increased air, water, sound and land pollution. Metallic drums and pans for fermentation, frying and boiling the sludge and well as plastic pipes for distillation, jericans for storage and utensils for serving the drinkers were prone to rapid wear and tear. Being non-biodegradable they led to rapid accumulation of sold waste not withstanding carbon dioxide and methane emissions from fuelwood and fermentation process respectively. Lichet, flies and odour smell that characterised all the brewing centres were catalysed by the accumulation of waste.

Description	Tests	Chang'aa distillation	Pollution
Chang'aa distillation	Pearson correlation	1	0.410*
	Significant (2tailed)	.	0.000
	N	100	100
Pollution	Pearson correlation	0.410*	1
	Significant (2tailed)	0.000	.
	N	100	100

Table 3: Correlation between chang'aa distillation and pollution
Notes: *Sig. = 0.01 level (2-tailed)

Binary Logistic regression strongly (93.56%) demonstrates that by the positive coefficient increases in chang'aa distillation significant increase pollution (0.009**). This suggests that the carbon dioxide and methane emitted accelerated deplete Ozone. Similarly, trees cut to provide fuelwood, solid waste generated and effluents discharged into the rivers shrunk the absorptive capacity of vegetation, land and water as carbon sinks. Thus chang'aa distillation emerged to be a component of the underlying causes of deforestation and forest degradation in Kenya according to Bare and Wangwe (2000), and climate change was the net effect.

Variables	B	Sig. T
Chang'aa distillation	2.209	0.009**
Constant	-0.511	0.323

Table 4: Influence of chang'aa distillation on pollution: Logistic regression
Overall 93.558%; **Sig.=0.01f=1

Finally, Pearson's correlation discloses a significant weak negative relationship (-0.191**) between Alcoholic Drinks Control Act, 2010 and chang'aa distillation which can be attributed to the festive December season. This concurred with Grant's (1998) revelation emerging alcohol markets characterised by changing patterns, problems, and responses. At the same time, chang'aa distiller had employed informers spread signals of potential police raids on all chang'aa brewing dens mobile phones and coded sounds. At time, a joint effort by both the distillers and the drinker mounted fierce confrontation that ended up scaring off the law enforces. The main distiller in Emuhaya County (*name withheld*) indicated that the Alcoholic Drinks Control Act, 2010 was inconsequential because all the law enforcing agencies including chiefs, and the police had been compromised by the high profits earned from chang'aa business. The complexities of regulating chang'aa distillation in Vihiga County conformed to the history of prohibition and control of alcoholic reported by Anderson and Carrier (2009).

Description	Tests	Alcoholic Drinks Control Act, 2010	Chang'aa distillation
Alcoholic Drinks Control Act, 2010	Pearson correlation	1	-0.191*
	Significant(2tailed)	.	0.051
	N	100	100
Chang'aa distillation	Pearson correlation	-0.191**	1
	Significant (2tailed)	0.051	.
	N	100	100

Table 5: Correlation between the Alcoholic Drinks Control Act, 2010 and chang'aa distillation

Notes: 1. *Sig. 0.05 (2-tailed)

2. Alcoholic Drinks Control Act, 2010 was measured in terms of the frequency of weekly surveillance by chiefs and police officers while chang'aa distillation was measured in terms of 20 litres Jeri cans per week

6. Conclusion

Cultural and economics underpinnings render chang'aa distillation an indispensable activity in Vihiga County. The way forward is to make it environmentally friendly, and contain illicit and counterfeit chang'aa by adequately enforcing regulations. Installing energy saving *jikos* could not only minimise fuel requirements, deforestation and pollution, but also maximise profitability to better human welfare. Agroforestry and proper waste management practices, and sensitising producers on the synergy between chang'aa distillation and climate change were necessary. Such policy interventions could enhance carbon sequestration, tame climate change and improve environmental quality.

Failing to incorporate the environment and particularly climate change exigencies in the crusade against chang'aa distillation was an oversight. In addition to domesticating the supply of, and demand for chang'aa the environment indiscriminately provided an open *Global Casino* for all stakeholders in the industry. Finally, the environment and particularly climate change bears the greatest cost of chang'aa distillation in Vihiga County, Kenya and globally.

Thus pollutants emanating from chang'aa distillation appear to be few and localised in spatial and temporal dimensions but their cumulative effect was worrisome. Irreversibility of their implications on climate change required a new dimension to making the distillation practice sustainable. To date, not all causes, effect and mitigations of climate change have been determined. Also, the environment could provide options and open opportunities to curb irresponsible chang'aa distillation hence minimise its adverse effects on climate change. Unfortunately, the formal and amorphous chang'aa distillation sector renders complicate the implementation of the Alcoholic Drinks Control Act, 2010 futile culminating to galloping climate change that harms the environment.

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