ENVIRONMENTAL TAXATION AND FOOD SECURITY IN SUB-SAHARAN AFRICA

Abstract

Purpose: The study examined the impact of environmental taxation on food security in sub-Saharan Africa.

Methodology: Panel data was obtained and ordinary least square regression was employed to analyze the data for the study.

Findings: The findings of the study depicted environmental taxation having a negative effect with food security in sub-Saharan Africa.

Practical Implication: The recommendation which emanated from the findings is that proper carbon accounting and carbon pricing should be carried out to ensure that firms are taxed properly as well as tax justice should be promoted

Originality: This research throws light on the contribution of accountants as well as the accounting discipline to sustainable development issues such as climate change and food security.

Comment [H1]: Abstract should not have paragraph but all in one paragraph

Key Words: Sustainable development; Carbon Tax; Food security; Economic development; Sub-Saharan Africa

Comment [H2]: Arrange Keywords alphabetically

1.0 Introduction

The year 2020 will indeed be remembered to be the year of the corona virus pandemic, but the head of the United Nations food programme has warned of another threat on the horizon (Thompson Reuters Foundation, 2021). While we are dealing with COVID-19, we are also on the brink of a hunger pandemic. Food insecurity is affecting approximately a billion people around the world (Food and Agricultural Organization (FAO), 2018). In Asia (515.1 million people) as well as Africa

(256.5 million people) (FAO et al. 2018), which already contain several of the world's poorest countries, the burden of undernourishment is heaviest.

Consistent with the Worldwide Hunger Index (GHI), despite a significant reduction in global hunger rates since 2000, the levels of hunger in Africa are deemed serious or worrisome (von Grebmer et al. 2018; FAO et al. 2017, 2018, 2019). What could be done to expedite advancement toward the Sustainable Development Goals (SDGs) of a hunger-free globe before 2030? Farmers worldwide presently grow enough food around 10 billion people (Holt-Giménez et al. 2012), that is more than the planet's population of 7.6 billion individuals (Population Reference Bureau, 2018).Notably, current economic trends reveal a moderate rise in per capita food production and agricultural productivity in most African nations, notwithstanding the fact that the industry currently faces significant problems (Badiane& Collins 2016; Benin 2016). Nonetheless, chronic hunger and malnutrition continue to be widespread and unacceptable.

As anecdotal evidence shows that due to the emergence of environmental accounting in 1960, traditional decision-making and reporting procedures are being increasingly integrated with carbon accounting (Hartmann et al, 2013), but investigation on carbon accounting is scarce. A carbon tax system has not been well studied and effectively administered in industrialized nations, as a result. In order to decrease pollution and greenhouse gas emissions, all OECD nations have implemented environmental levies to various degrees during the past two decades. Others began adopting environmental tax changes in the early 1990s, based on a "revenue recycling scheme" that moves the tax burden from labor, personal and corporate income to ecologically damaging activities (European Environment Agency, 2005).

Furthermore, environmental taxes are also used to reduce labor taxes and social security costs in order to increase growth and employment. Theoretically and empirically, the impact of environmental taxes on economic growth has been widely discussed in recent literature (Izlawanie&Norfakhirah, 2021; Mahmoud, Walid& Damien, 2020). While this notable development has been identified, there is still little focus on sustainable development such as the focus on food security. To us, it is crucial to investigate if the use of environmental taxation as a tool for environmental management has any link with food security, and if so, whether it is significant. This creates a need to examine the impact of environmental taxation on food security in Africa.

2.0 Literature Review

2.1 Conceptual Review

2.1.1Food Security

According to the United Nations, food security implies that every human being, at all times, has access to sufficient, secure, and nutritious food that satisfies their dietary choices and nutritional needs, both physically, socially, and economically, for an active and healthy life.Food security is essential for human health and welfare, as well as economic and political stability, and is therefore a hot subject in a variety of academic areas (Havas& Salman, 2011; Candel, 2014). Failure to provide food security results in food insecurity and its associated problems. Human suffering will be catastrophic as a consequence of food insecurity. Scientific data suggests that a poor diet has a negative effect on immune system health and increases the incidence and severity of illness (Maggini, Pierre & Calder, 2018; Chandra, 1997).

During the 1974 World Food Conference, the concept "food security" was established, including a concentration on availability. Food security is described as the high availability of a sufficient, nutritious, diverse, and appropriate global food system to maintain a steady growth in food demand as well as to offset for changes in demand as well as costs (FAO, 2003). The definitions that followed discussed demand as well as access problems. As per the World Food Summit's final report from 1996, food security exists "if individuals have access to adequate, healthy, and nutritious food at all times to fulfill their dietary needs and dietary choices for healthy and active life" (Raj, 2013).

2.1.2 Environmental Taxation

Environmental taxes are Pigouvian in nature, with the goal of reducing the environmental costs of greenhouse gas emissions. Carbon tax is a kind of environmental tax that is imposed on the carbon content of fuels. The carbon tax affects a broad variety of sectors, including industry and agriculture. The Nordic nations first implemented a carbon price in the 1990s. Finland is the first among them to implement a carbon price. The carbon tax in Finland is levied on diesel, gasoline, jet fuel, heavy and light fuel oil, coal, and natural gas. Norway implemented a carbon tax in 1991, levied on gasoline, fuel oil, oil, and gas in the North Sea. Sweden, another Nordic nation, implemented a carbon price in 1991. Denmark enacted a carbon price in 1992.

Similar programs, meanwhile, have moved at a relatively slow rate throughout the developing world. Also South Africa, the 14th highest emitter of GHG globally (ACCA, 2021) which is one of the nations most impacted by climate change, has a substantial carbon price, which went into effect in 2019. According to COVA consulting study, the tax collected an estimated R2.5 billion (US$175 million). As per Standard Chartered'sZeronomics report, African business executives favor an universal carbon tax centered on a carbon price that represents the actual impact of climate change to aid in the transformation to a carbon-neutral economy. Moreover, a carbon tax could assist to broaden the tax base in Africa, which has a large, untaxed "informal sector." The ensuing increase in tax receipts might enable increased spending on historically impoverished development areas such as health, the environment, as well as education, while also assisting governments in meeting their sustainable development goals (ACCA, 2021)

Environmental taxes may accomplish the necessary environmental benefit at the lowest possible cost to society as a whole (Baumol& Oates, 1971). It is currently the primary method for justifying environmental levies (Ekins& Speck, 2011). However, the argument over the impact of these taxes on economic development remains a point of contention among academics to this day.

2.2 Theoretical Review

This study is built on the theoretical framework of accountability. Lerner and Tetlock (1999) are credited for the development of the accountability theory. Accountability refers to the implicit or explicit assumption that one's thoughts, attitudes, and actions will be called upon to defend them to others (Scott & Lyman, 1968; Geber, Semin&Manstead, 1983; Tetlock, 1992). Accountability also indicates that those who fail to present an acceptable reason for their actions will face negative repercussions (Stenning, 1995). People who present persuasive arguments, on the other hand, will face favorable outcomes ranging from reduced penalty to rich rewards. Responsibility has recently been associated with punishment or consequences, eroding the traditional understanding of accountability as providing an account and defending one's behavior to those to whom one is accountable (Mansbridge, 2014).

The assumptions of the theory are built on four major constructs, which are identifiability, expectation of value, awareness of monitoring and social presence. The construct 'identifiability' was gotten from Williams, Harkins and Latane (1981), who explained it to mean the awareness of an individual that the outcome of his actions and activities can be traced back to him. Lerner and Tetlock (1999) defined 'expectation of value' as persons being made aware that there would be rewards or repercussions for their actions. Finally, Vance, Lowry, and Eggett (2015) defined 'knowledge of monitoring' as social concerns that their actions are being observed by others. They also defined 'social presence' to be the knowledge of the existence of other stakeholders in a system.

The accountability hypothesis fits into the rhetoric of environmental taxes since stakeholders demand firms to provide qualitative as well as quantitative data, including statistics on carbon dioxide emissions by organizations. By doing so, entities can be taxed adequately, based on their level of carbon emission.

2.3 Empirical Review

Wu and Thomassin (2018) conducted research for Canada on the carbon tax system and its influence on food prices and consumption. Provincial and federal carbon tax system was the focus of the study, and also inter-provincial and national price model application was utilized. National price model was developed using the model for Canada price statistics, which served as the methodology. The result of the study indicated a negative effect between carbon tax and food price and consumption.

Springmann, Mason-D'Croz, Robinson, Wiebe, Godfray, Rayner, and Scarborough (2017) reported in Saxeena (2016) that if tax-adjusted food prices are predicated on the environmental effect of their production, agricultural environmental costs might be significantly reduced. As an added benefit, the tax revenue might be utilized to reduce the cost of healthier and far more ecologically friendly meals. The study employed an estimated emissions price of $52 per metric ton of CO2 to determine how much environmental tax should be applied to foods, a cost determined to equate to the present value of future climatic effects associated with each extra ton of carbon dioxide as well as its equivalent.

Furthermore, this comprehensive taxing policy was most effective in terms of increasing tax collections. These levies might then be sometimes used subsidize fruits and vegetables, encouraging people to eat healthier, less ecologically damaging meals. In this way, it may be analogous to the fee-and-dividend strategy proposed for carbon emissions. The study accounted for these potential negative consequences in their model and discovered that if tax policies were customized to each location, the negative consequences could be mitigated while the global health impact remained highly good. Contrary to popular belief, the study discovered that such an environmental tax would result in lower food costs and increased food supply.

Akinwande (2014) analyzed the recommended carbon tax system in the light of South Africa's promise. This was in a bid to see if South Africa can learn from the similar environmental tax regime adopted by Nigeria. Findings reveal that carbon tax in South Africa would be regressive, leading to social inequality. Also, comparing to the Nigerian situation, there has to be a legislative framework for the mandatory reporting of emission if the tax system is to achieve desired results.

3.0 Methodology

This study examined the impact of environmental taxation on food security in SSA. It adopted the Ex-post facto research design which examines data from past events and they cannot be easily manipulated. The study made use of secondary data which was sourced from the world development indicator (WDI) database and Food and Agriculture organization (FAO) database. Pearson's product moment correlation was employed to examine the degree of association amid environmental taxation and food security and to determine the existence of multicollinearity problem among the explanatory variables.

The General Method of Moments (GMM) estimate method was adopted for this study. The Ordinary Least Squares (OLS) estimating method has a significant difficulty in that it fails to address the endogeneity problem of the independent variables caused by correlation between the delayed dependent component and the residuals. The Least Square Dummy Variable (LSDV) model combined with the lagged dependent variable offers response from past or current shocks to the present dependent variable. This requirement is handled in Arellano and Bond's (1991) and Arellano and Bover's (1992) Generalized Method of Moments (GMM) approach (1995).

This dynamic approach handles temporal auto-correlation in the error term, preventing false regression. The GMM approach, which, when compared to the OLS method, would address endogeneity and heteroskedasticity issues and enhance estimator performance in a panel model (Headey, 2013). Furthermore, the robust version of the System-GMM (SYS-GMM) estimating model modified by Blundell and Bond (1998) was used in this research, which is an improvement on the GMM method due to the inclusion of the instrumental variables (IV), which is why we chose the model. The population of this study is the 48 countries in Sub-Sahara Africa. However, the convenient sampling technique was adopted based on data availability. Using the convenient sampling technique, a total of 22 countries in SSA where selected

3.1 Model Specifications

The econometric model used to analyse the impact of environmental taxation on food security is as follows:

In order to analyze the research objective of this study, the model of Oguntegbe, Okoruwa, Obi-Egbedi and Olagunju (2018) is adapted and expressed below:

$$AVAIL = \beta_{oit} + \Omega AVAIL_{it-1} + \beta_1 ENVTAX_{it} + \beta_2 AP_{it} + \beta_3 PG_{it} + \beta_4 CAP_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where

AVAIL= Food Availability

ENVTAX= Environmental Tax

PG = Population growth rate

Ω is the coefficient of the first-lag of the dependent variables in equation

εt = Error term

3.2 Description and Measurement of Variables

Dependent Variable (Food Security)

This is measured based on indicators of food security by Maxwell, Coates and Vaitla (2013); FAO (2013)

i. **Food Availability** was measured using the food production index for Sub-Saharan Africa. This captures food crop that are considered edible and contains nutrients

Independent Variable

Environmental taxes

International organizations define environmental tax as "a tax whose tax base is a physical unit (or a proxy of it) that has a proven specific negative impact on the environment" (United Nations, 2003). The measurement of environmental tax used in this study is established by the United Nations description, which is recognised by the major international organizations, including the OECD as well as the European Union's Statistical Office (Eurostat). The OECD figures on environmental tax revenue include taxes on energy items such as fossil fuels, electricity, including transportation fuel (petrol and diesel). Most CO2-related taxes are included.

Control variables

Capital Input (CAP): This is proxied using gross fixed capital formation, which constitute all plant, machinery, and equipment purchases for productivity. It is measured in Trillions.

Agricultural productivity (AP) (Proxied by Agricultural value added): Agricultural productivity is captured as the ratio of agricultural outputs to agricultural inputs

Population Growth (PG): Population Growth is the increase in the number of individuals in a population

4.0 Data Analysis and Interpretations

Table 1: Descriptive Statistics

	AVAIL[a]	ENVTAX	AP[b]	CAP	PG[b]
Mean	99.48958	1.071212	20.08756	5.178429	2.383860
Median	100.3000	0.760000	20.98087	5.416525	2.636720
Maximum	128.2700	12.39000	54.89981	78.05802	3.907245
Minimum	72.97000	0.000000	1.884542	-38.53308	0.032240
Std. Dev.	8.272899	1.561095	11.99317	13.52892	0.866233
Skewness	0.015661	4.243839	0.395491	0.797028	-0.879117
Kurtosis	4.884205	27.89833	2.895346	8.350619	3.477324
Jarque-Bera	29.29749	5708.730	5.251999	257.1536	27.38363
Probability	0.000000	0.000000	0.072367	0.000000	0.000001
Sum	19698.94	212.1000	3977.338	1025.329	472.0042
Sum Sq. Dev.	13482.85	480.0923	28335.70	36057.24	147.8207
Observations	198	198	198	198	198

a - Figures in Index

b - Figures in Percentage

***Source**: Authors Computation (2021)*

From table 1 above, the mean value of AVAIL is 99.48958, with a maximum as well as minimum value of 128.2700 and 72.97000 correspondingly. The standard deviation of 8.272899 which is high indicates that AVAIL (proxy for Food security availability) has been relatively unstable over the period in view i.e. 2011 to 2019 in SSA. In addition, the standard deviation of 8.272899 is highly lower than the mean value of 99.48958, which implies a strong dispersion from the mean. It also suggests a high unpredictability of food availability in sub-Saharan Africa.

In addition, ENVTAX shows a mean value of 1.071212, with a maximum and minimum value of 12.39000 and 0.000000 respectively. The standard deviation of ENVTAX is 1.561095.

AP has a mean of 20% with a maximum and minimum percentage of 55% and 2% respectively. The low mean value of AP indicate that AP rate is relatively low in SSA while the standard deviation of 12% also shows that AP have been unstable over the period in view. A reason for low AP might be as a result of slow pace of technology adoption in SSA, the available technologies are inappropriate to local conditions, the low levels of capital availability and high post-harvest losses resulting from transportation losses and inability to process raw agricultural product into finished goods that command high prices with increased shelf life.

CAP has a mean value of 5.178429, with a maximum and minimum value of 78.05802 and -38.53308 respectively. The standard deviation of CAP is 13.52892.

PG has a mean of 2% with a maximum and minimum percentage of 4% and 0.03% respectively. The low mean value of PG indicate that PG rate is relatively High in SSA while the standard deviation of 0.87% also shows that PG have been stable over the period in view. Africa's rapid population expansion is primarily owing to high total fertility rates and advances in healthcare system, which have resulted in a considerable fall in newborn and child mortality rates (UN, 2011).

Skewness is a statistical study used to quantify deviations from symmetry. A distribution or data set is considered to be symmetric if it is uniformly distributed to the left and right of the center point; skewness is 0 in this case. Positive skewness numbers represent data that is skewed right or positively skewed, whereas negative values represent data that is slanted left or negatively skewed (Gujarati, 2003).

From the table above however, PG with values of -0.879117 is negatively skewed, while other variables AVAIL (0.015661), CAP (0.797028), AP (0.395491), and ENVTAX (4.243839) are positively skewed.

Kurtosis quantifies the degree to which data is peaked or flat in comparison to the normal distribution. The kurtosis of the normal distribution is 3. Excess kurtosis (Ex. kurtosis) is simply kurtosis minus three (i.e., kurtosis – three). Kurtosis for the normal distribution, for example, is thus 0 (i.e., 3 - 3 = 0). The normal distribution is symmetric, with kurtosis of 3 or Ex. kurtosis of 0. A distribution with kurtosis or Ex. kurtosis greater than the normal distribution suggests peakedness or lepto-kurtic data, whereas a distribution with kurtosis or Ex. kurtosis less than the normal distribution indicates flat or plato-kurtic data.

A mesokurtic distribution has kurtosis or Ex. kurtosis at the normal distribution. In other words, a distribution with kurtosis > 3 or Ex. kurtosis > 0 suggests peakedness or laptokurtic data, whereas a distribution having kurtosis 0 or Ex. kurtosis 0 represents flat or plato-kurtic data. A mesokurtic distribution has a kurtosis of 3 or Ex. a kurtosis of 0. (Gujarati, 2003).

The kurtosis for variables AVAIL, ENVTAX, CAP and PG are all greater than 3, i.e. 4.884205, 4.893564, 17.51889, 2789833, 8.350619 and 3.477324 respectively, indicating that the distributions are peaked relative to data normal distribution or lepto-kurtic. While kurtosis for AP is less than three. i.e. 2.895346 indicating that the distributions are flat relative to data normal distribution or plato-kurtic.

Finally, the Jarque-Bera statistics rejected the null hypothesis of normal distribution for all variables except Agricultural Productivity (AP) at 5% critical value, while it accepted the null hypothesis of normal distribution for AP at 5% critical at value. This depicts that most of our variables are not normally distributed.

4.1 Correlation Analysis

Table 2: Result of the correlation analysis

	AVAIL	ENVTAX	AP	CAP	PG
AVAIL	1.000000	-0.028316	0.003342	0.023461	-0.075192

ENVTAX	-0.028316	1.000000	-0.085217	-0.051055	-0.043235
AP	0.003342	-0.085217	1.000000	-0.002077	0.748111
CAP	0.023461	-0.051055	-0.002077	1.000000	0.094542
PG	-0.075192	-0.043235	0.748111	0.094542	1.000000

Source: *Author's Computations (2021)*

Table 2 above shows the result of the correlation analysis. The reason for the correlation analysis is to check for multicollinearity between the independent variables. Because the correlation coefficients of all variables are less than the set limit of not more than 0.8, there exists no concern with multicollinearity. Gujarati (2004) proposed that if the correlation is more than 0.8, serious multicollinearity might exist.

	Dependent Variable: Food Availability				
	Independent Variable: Environment Tax				
	(1)	(2)	(3)	(4)	(5)
Availability (-1)	**0.751*** (0.0664)**	**0.773*** (0.0559)**	**0.728*** (0.0294)**	**0.724*** (0.0383)**	**0.672*** (0.0432)**
Environment Tax	0.143 (0.142)	0.163 (0.137)	0.139 (0.124)	-0.0141 (0.189)	0.193 (0.151)
Capital Output		**0.0369****			0.0119

		(0.0140)			(0.0173)
Agric Productivity			-0.0334		0.148
			(0.0553)		(0.116)
Population Growth				-0.639	**-3.177***
				(0.988)	**(1.746)**
Constant	**27.87*****	**25.16*****	**30.62*****	**31.45*****	**38.30*****
	(6.444)	**(5.400)**	**(3.336)**	**(5.510)**	**(6.796)**
Time Effect	Yes	Yes	Yes	Yes	Yes
AR(1)_P-value	[0.005]	[0.007]	[0.006]	[0.005]	[0.004]
AR(2)_P-value	**[0.099]**	**[0.099]**	**[0.106]**	**[0.099]**	**[0.079]**
SarganProb	**[0.664]**	**[0.454]**	**[0.960]**	**[0.431]**	**[0.622]**
Hansen Prob	**[0.526]**	**[0.687]**	**[0.865]**	**[0.457]**	**[0.724]**
DHT for Instruments					
(a) Instruments in levels					
H excluding group	**[0.554]**	**[0.441]**	**[0.867]**	**[0.915]**	**[0.823]**
Dif (null, H=exogenous)	**[0.416]**	**[0.678]**	**[0.711]**	**[0.255]**	**[0.523]**
(b) IV (years, eq(diff))					
H excluding group	--	--	--	--	**[0.813]**
Dif(null, H=exogenous)	--	**[0.687]**	**[0.865]**	**[0.457]**	**[0.465]**
No. of Instruments	14	18	18	18	22
Countries	22	22	22	22	22
Observations	176	176	176	176	176

Table 3: Environment Tax and Food Availability in sub-Saharan Africa

****, **, *: significance levels at 1%, 5% and 10% respectively. The difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen tests. Constants are included in all regressions. ( ) for standard errors of estimated coefficients and [ ] for p-values of all other tests.*

***Source:** Author's Computations (2021)*

From table 3**(1)** (**Estimation of Environmental Tax and Food Availability in sub-Saharan Africa**), the coefficient of ENVTAX is 0.143 with p-value > 0.01, 0.05 and 0.10 indicating that there exists positive and non-significant relationship between Environmental Tax and food security (Availability) in sub-Saharan Africa. The value of the coefficient implies that a percentage increase in **Environmental Tax** will cause the dependent variable (Food Availability) to increase by 14% in the short-run ceteris paribus and vice-versa.

Also from table 3 **(5)**, when controlled by AP, PG and CAP, the coefficient of ENVTAX is 0.193 with p-value > 0.01, 0.05 and 0.10 significance level. This indicates that there exists a positive and non-significant relationship between environmental tax and food availability in sub-Saharan Africa. The value of the coefficient implies that a percentage increase in environmental tax will cause the dependent variable (Food Availability) to increase by 19% in the short-run ceteris paribus and vice-versa.

From the Sargan test, it can be seen that all probability values are greater than 5% so we accept the H_0 that all instruments are valid (Goodman, 2009). Further, the null hypothesis of the first order autocorrelation test is rejected which is not the case for the null hypothesis of the second order autocorrelation test of residuals. This implies that the errors are not correlated over time and hence the consistency of the dynamic GMM estimator. However, according to Roodman (2006), it is recommended that the Sargan P-value should be greater than 0.25. also, the Hansen test shows P-value greater than 5% meaning that endogeneity is not a significant issue in this regression.

Similarly, according to Roodman (2009), it is expected that the null hypothesis of nonexistence of serial correlation of order one AR (1) is rejected while the null hypothesis of nonexistence of serial correlation of order two AR (2) is expected to be accepted. Furthermore, the AR(2) P-values are all greater than 5% which means there is absence of second order autocorrelation of errors while the AR(1) P-value are less than 5% so the null hypothesis is rejected.

5.0 Conclusion and Recommendations

This study was carried out to examine the impact of environmental taxation on food security in sub-saharan Africa. From table 3**(1)** (**Estimation of Environmental Tax and Food Availability in sub-Saharan Africa**), the coefficient of ENVTAX is 0.143 with p-value > 0.01, 0.05 and 0.10 indicating that there exists positive and non-significant relationship between Environmental Tax and food security (Availability) in sub-Saharan Africa. The value of the coefficient implies that a percentage increase in Environmental Tax will cause the dependent variable (Food Availability) to increase by

14% in the short-run ceteris paribus and vice-versa. Since the P-value is not significant, we reject the null hypothesis and accept the alternative hypothesis that says there is no significant relationship between Environmental Tax and food security (Availability) in sub-Saharan Africa.

This finding is in tandem with that of Springmann, Mason-D'Croz, Robinson, Wiebe, Godfray, Rayner and Scarborough (2017) in According to Saxeena (2016), such taxes may therefore be used to subsidize vegetables and fruits, frequent consumption of healthy, less ecologically damaging foods. In this way, it may be analogous to the fee-and-dividend strategy proposed for carbon dioxide emissions. The study accounted for these potential negative consequences in their model and discovered that if tax policies were customized to each location, the negative consequences could be mitigated while the global health impact remained highly good. Contrary to popular belief, the study discovered that an environmental tax would result in lower food costs and increased food supply. From the research findings, it was recommended that the government should set up programs that indirectly reduces food insecurity through shielding consumers from the negative effects of environmental taxes. Also, proper carbon pricing should be done to capture the cost of emissions of an organization to promote accountability.

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