



BURP TAX: REGULATION AND REVENUE POTENTIAL IN INDONESIA

Muhammad Ihsan ¹⁾; Devina Aurellia Rakasiwi ²⁾

¹⁾ ihsangsc15@gmail.com, Politeknik Keuangan Negara STAN

²⁾ devina_4132230032@pknstan.ac.id, Politeknik Keuangan Negara STAN

Abstract

The increasingly urgent phenomenon of climate change requires concrete actions from various sectors, including the livestock sector which is a significant contributor to greenhouse gas emissions, particularly methane. This study explores the potential of implementing Burp Tax in Indonesia as a regulatory mechanism to reduce methane emissions from beef and dairy cattle farms. By referring to New Zealand's experience as a Burp Tax pioneer, this study analyzes the policy scheme that includes tax subjects, tax objects, tariffs, and fair and efficient collection mechanisms. In addition, this study identifies various obstacles that may be faced in the implementation of Burp Tax in Indonesia and provides recommendations to support the national commitment in achieving the Zero Emission target in 2045/2060. The research used qualitative methods with literature study data collection techniques. The research concludes that there is great potential for the imposition of Burp Tax, so that in addition to being a form of effort to reduce methane emissions from beef and dairy cattle farms, Burp Tax can also increase the portion of state revenue from the taxation sector. The specific tariff scheme is IDR30/KgCH₄ with tax subjects in the beef and dairy cattle farming sector, including individuals with 30 cows and business entities. However, it is important to note that the imposition of Burp Tax may have an economic impact on livestock business actors and affect the price of meat and milk commodities. Therefore, further studies are needed regarding the potential and impact of Burp Tax implications in Indonesia. The results of this study are expected to make a significant contribution to the development of sustainable taxation policies that are responsive to the challenges of climate change.

Keywords: Climate change, Livestock, Methane emissions, Taxation policy

INTRODUCTION

Signs of climate change are increasingly evident in the form of rising global temperatures in all parts of the world, and tropical storms such as the recent cyclonic Anggrek storm that Indonesia experienced at the beginning of the year which was marked by extreme rainstorms in several areas of Indonesia. Countries around the world have actually agreed to jointly tackle the negative effects of rapid climate change in the form of the Paris Climate Agreement in 2015.

Indonesia is one of the developing countries that is expected to participate in efforts to tackle climate change by issuing Law No. 16/2016 on the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. As a form of government participation in efforts to tackle climate change that occurs, Indonesia is committed to achieving Net Zero Emission by 2060 and reducing carbon emissions by 2030.

In achieving the Net Zero Emission target and reducing carbon emissions, Indonesia has taken part by passing Law No. 7 of 2021 on Regulatory Harmonization, in which Article 13 specifically regulates Carbon Tax. But is setting a commitment to reduce carbon emissions by 2030 enough to achieve Net Zero Emission and control climate change?

Zero United Nations Framework Convention on Climate Change (UNFCCC), a UN Convention on Climate Change, states that carbon dioxide is not the only gas that contributes to GHGs, but there are 6 types of gases that are classified as GHGs, namely CO₂ (carbon dioxide), CH₄ (methane), N₂O (nitrous oxide), HFC (hydro fluoro carbon), PFC (per fluoro carbon), and SF₆ (sulfur hexa chloride). So from this statement, carbon dioxide is not the only gas that needs to be addressed and minimized, but other gases also need to be suppressed, such as methane gas. Methane dissipates faster than carbon dioxide, but is a much more potent greenhouse gas in the short term (IEA, 2023).



The International Energy Agency (IEA) in its Global Methane Tracker 2023 Report published in February 2023, states that “methane gas is responsible for about 30% of the global temperature rise since the Industrial Revolution”. The IEA also states that reducing methane emissions is key to limiting short-term global warming and improving air quality. Therefore, methane gas is one of the focuses discussed at the Climate Summit (COP26) held in Glasgow in November 2021 (BMKG, 2022).

In its report, the IEA also states that “annual global methane emissions amount to about 580Mt”. This figure accounts for 40% of natural global methane emissions, and 60% from human activities, known as anthropogenic emissions.

Figure 1. The World's Largest Methane Producing Countries Ranking

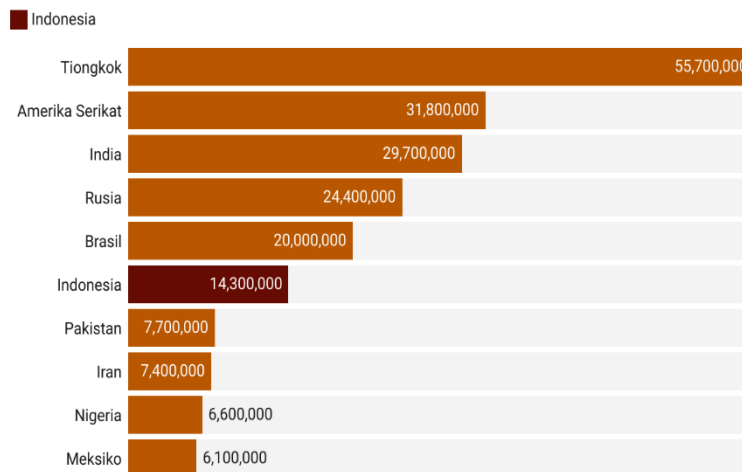


Chart: Aulia Mutiara Hatia Putri • Source: EIA • Created with Datawrapper

Source: Putri (2023)

Indonesia ranks as the 6th largest methane emitter in the world, with 14.3 million tons in 2022. Indonesia, along with the other 9 largest methane-emitting countries, contributes 57% of the total global anthropogenic methane emissions.

Through COP26 activities, Indonesia committed to cut global methane emissions by 30% before 2030 by signing the “Global Methane Pledge” framework with hundreds of other countries (BMKG, 2022). Livestock emissions (from manure and gastroenteric release), account for about 32% of human-caused methane emissions (Breathelife2030, 2021). Methane is generated in the digestive tract of livestock, with 80-95% in the rumen being released through burp into the atmosphere, and 5-20% in the large intestine.

The Intergovernmental Panel on Climate Change (IPCC), a United Nations (UN) body that evaluates climate, in its publication entitled “IPCC Guidelines for National Greenhouse Gas Inventories in 2006, presents data on methane gas produced by each livestock animal per head in one year. The data in the publication states that among farm animals, cows produce the most methane gas both from the digestive process and from manure management.

Professor of Bogor Agricultural University (IPB), Anuraga Jayanegara in his scientific oration on September 16, 2021 stated that “the existence of 16 million broiler cattle and 600,000 dairy cows in Indonesian farms has an impact on global warming ” (Antara, 2021). In 2022, the beef cattle population in Indonesia was 17,245,043 heads, and the dairy cattle population was 507,075 heads (Direktorat Statistik Peternakan, 2023). From these data, it can be expected that there will be an increase in methane gas generated from the livestock sector in line with the increase in the number of cattle population in Indonesia.

A mitigation stance along with immediate and significant changes to address methane gas growth is necessary to reduce methane gas emissions in line with the goal of zero emissions



in order to address international climate change. Government policies and regulations play an important role in these mitigation efforts. One of the policies that can be made by the government is tax policy. Taxation policy can be an effective tool to encourage methane emission reduction because direct taxation on methane emissions from various sectors provides incentives for individuals and companies to manage their emissions.

One of the taxation policies that can be established is the Burp Tax policy. Burp Tax is an informal term for a tax imposed on methane emissions produced by livestock, especially cattle. Because cattle are the largest contributor to methane gas in Indonesia, it is necessary for the government to consider imposing this Burp Tax, especially on the livestock sector in Indonesia.

Based on the analysis of the fact that carbon dioxide gas is not the only contributor to GHGs, but there is also methane gas which also contributes greatly to high gas emissions, also looking at the fact that methane gas is mostly produced by livestock through gastroenteric, and the fact that Indonesia is the 6th country as the largest methane gas contributor in the world as well as the large number of cattle in Indonesia, this research raises the topic of Burp Tax to be reviewed because there is a need to reduce methane gas emissions in Indonesia which are mostly produced from the cattle farming sector which can be realized with tax instruments. However, to formulate a policy, a study on the necessary aspects is needed.

This research has three objectives, namely to examine the potential for the imposition of Burp Tax in Indonesia, analyze what obstacles might occur by linking it to the condition of livestock in Indonesia, and provide suggestions on how the possible taxation scheme in Indonesia.

It is hoped that the results of this study can contribute as a consideration for the government as a policy formulator, especially related to tax extensification in Indonesia, and provide advice to the government to make policies that support Indonesia's commitment to achieve Zero Emission by 2060.

LITERATURE REVIEW

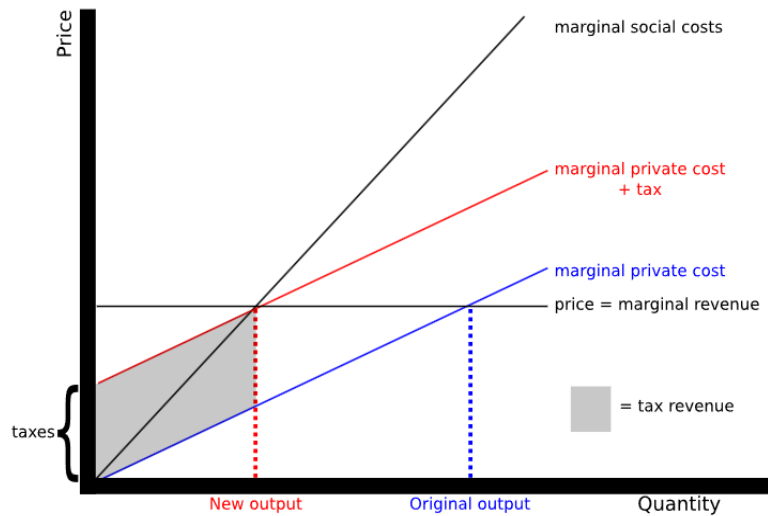
Pigovian Tax

Pigovian tax is a term derived from the name of a British economist, Arthur Pigou, who developed the concept of externalities in the 1920s (Handayani, 2023). Arthur in his book entitled "The Economics of Welfare", argued that industrialists tend to seek profits beyond marginal profits, this attitude sometimes leads to positive and negative externalities. A positive externality is when the beneficiary does not pay the party that creates the externality. Negative externalities, on the other hand, are when an economic activity results in social costs that are not borne by the party causing the externality. This negative externality is the focus of the problem as it can be in the form of environmental pollution and health impacts experienced by residents in the vicinity of business activities. To address these negative externalities, Pigou recommended a tax imposed on producers who generate these negative externalities. This tax is known as the Pigovian tax.

A pigovian tax is a tax equal to the external cost per unit of an economic activity (Handayani, 2023).



Figure 2. Pigovian Tax Graph



Source: Wikipedia (2021)

The graph explains how pigovian taxes work in addressing the impact of negative externalities, such as emissions from factories. The tax shifts the private marginal cost curve, which represents the additional cost to the producer of producing one additional unit of a particular good or service. The rise in the private marginal cost curve along with the amount of the externality shows that the more emissions produced, the higher the additional cost to the producer.

By taxing the amount of emissions produced from the factory, producers have an obligation to reduce their output to a more socially optimal level. This means that producers have to consider the cost of the tax in their production decisions, so they are more likely to reduce emissions or adopt cleaner technologies to reduce their negative impact.

In Indonesia itself, the pigovian tax that has been introduced is the Carbon Tax stipulated in article 13 Law No. 7 of 2021 concerning Harmonization of Tax Regulations.

Four Maxim of Taxation

In the book *Readings in Economic Sociology: Chapter 1 - An Inquiry into the Nature and Causes of the Wealth of Nations* (Smith, 2002), Adam Smith introduced a concept called the four maxim of taxation. The four maxim of taxation is a set of principles that outline the ideal characteristics of a taxation system. The four “maxim” proposed by Adam Smith include:

1. Equity (Equality)

“The subjects of every state ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities; that is, in proportion to the revenue which they respectively enjoy under the protection of the state” (Hutchins, 1952; Smith, 2002). The sharing of the tax burden among paying individuals should be done fairly according to their financial capabilities, which should be in line with the revenue they earn, with the government acting as the guardian of the principle of equality. Under this principle of equality, a state is not allowed to discriminate between equal taxpayers; in other words, individuals who are in the same situation should be subject to the same tax burden. Thus, this principle implies that taxpayers who have higher economic capabilities and greater wealth should be subject to higher tax rates in accordance with their economic capabilities.

2. Certainty

“The time of payment, the manner of payment, the quantity to be paid, ought all to be clear and plain to the contributor, and to every other person” (Hutchins, 1952; Smith, 2002). The tax that must be borne by a person must be certain and not arbitrary. In this principle of clarity, what is important is legal certainty related to the subject, object, amount of tax, and also



the period of payment (Cahyono, 2021). This principle emphasizes that every tax collection must be adjusted to the applicable law, so that violations will be subject to legal sanctions in accordance with these regulations. Tax collection must be carried out openly and in accordance with the applicable legal provisions, namely the Law (UU).

3. Convenience of Payment

“Every tax ought to be levied at the time, or in the manner, in which it is most likely to be convenient for the contributor to pay it.” (Hutchins, 1952; Smith, 2002). The suggested method of tax collection (also known as “ease of payment”) suggests that taxes should be collected at the most convenient time for the taxpayer, i.e. as soon as the relevant income is received (Cahyono, 2021). This is so that the taxpayer does not feel burdened or object to the tax being collected. Avoiding overly complicated filing procedures also falls within the scope of this principle as it provides taxpayers with the convenience of payment.

4. Economy (Efficiency)

“Taxes ought to be so contrived as both to take out and to keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the state” (Hutchins, 1952; Smith, 2002). This efficiency principle emphasizes that tax collection should be done as efficiently as possible; the cost of collection should not exceed the tax revenue obtained (Cahyono, 2021). This principle relates to efforts to reduce the cost of tax collection as efficiently as possible. This indicates that in the process of tax collection, it must be done efficiently and appropriately so that the purpose of tax collection can be achieved. This includes avoiding excessive tax loopholes that allow individuals or business entities to avoid paying their fair share.

To this day, Adam Smith's principles of taxation are still relevant for defining modern tax justice (Lefevre, 2016). The Four Maxims of Taxation, combined with several other theories can provide a comprehensive framework for the concrete analysis of taxation. Coutinho (2001) found that combining the four maxims with income theory can provide a hierarchy of principles that determine tax assessment criteria. Furthermore, Coutinho (2001) explains that an understanding of the four maxim must be understood in the context of an increasing tax burden. Ultimately, the pressure on general revenues is due to the government's inability to control spending and collect additional revenue from taxes.

Burp Tax Implementation in Other Countries

The Burp Tax was first introduced by New Zealand, a country with seven times more livestock than people. A study states that New Zealand's largest dairy company, Fonterra, is one of the top 10 agricultural greenhouse gas emitters in the world (Parker, 2021). Fonterra could produce emissions that meet 100% of New Zealand's emissions target in its nationally determined contribution under the Paris Agreement by 2030 (Parker, 2021). Therefore, New Zealand then expressed its commitment to reduce emissions, especially methane emissions, as outlined in the Global Methane Pledge along with 109 other countries, which contains a commitment to collectively reduce methane emissions by at least 30% from 2020 levels by 2030 and is enshrined in domestic law (Parker, 2021).

New Zealand first announced its plan to tax livestock emissions from farmers in October 2022 as announced by Prime Minister Jacinda Ardern. This is one of the steps New Zealand is taking towards a low-emission future. The Burp Tax is planned to be established as an official levy in New Zealand because cattle from their farms are considered to be the main cause of climate change in New Zealand, as their burps and farts contain methane. The Burp Tax is levied on farmers based on the size of their land and the number of livestock they own. The Burp Tax is planned to be introduced in 2025 and is calculated based on the amount of burps emitted by their cows and sheep.



The Irish Examiner cites the Burp Tax's calculation method, which uses a modeling approach from the NGO Beef + Lamb New Zealand Ltd. Beef + Lamb New Zealand Ltd, an agricultural industry organization representing sheep and beef cattle farmers in New Zealand, assumed a calculation with an estimated cattle farm size of 330 hectares, which would emit 2,600 kilograms of methane per hectare. At a tax rate of €0.067 per kilogram, it is estimated that the Burp Tax will cost the farm more than €52,000. The estimated increase in costs due to the Burp Tax quickly drew criticism, especially from farmers, as the Burp Tax would cost the country's cattle farms more than €11,000 per year or €34 per hectare and threaten farmers' livelihoods (Cadogan, 2022).

The plan to impose the Burp Tax in New Zealand was met with protests from farmers as demonstrated by a protest convoy on October 20, 2022 using tractors and pickup trucks in cities and towns across the country to demand that the government cancel the Burp Tax. Following the onslaught of action taken by farmers in protest against the Burp Tax plan, the New Zealand government then took a stance to postpone the cattle and sheep tax plan ahead of the October 2023 election.

METHODS

The method used in this research is qualitative with a literature study approach. The author collects data and information related to the research theme to be analyzed and used. In writing this literature study, the sources used come from literature relevant to the topics discussed in the research. These sources come from scientific journals, online articles, online publications, and credible and reliable online news media as supporting data for the research. The keywords used include gas emissions and methane gas. The author also collected data and information related to Burp Tax taxation in New Zealand as the first pioneer of Burp Tax imposition. The data and information collected are then used as the basis for analysis to find the potential for tax extensification from the livestock sector, the constraints experienced, and the Burp Tax taxation scheme in Indonesia.

RESULTS AND DISCUSSION

Burp Tax Potential in Indonesia

The calculation of greenhouse gas (GHG) emissions from the livestock sector can refer to the guidelines issued by the Intergovernmental Panel on Climate Change (IPCC) (Intergovernmental Panel on Climate Change, 2006). The IPCC GHG calculation method consists of 3 tiers that represent the complexity of GHG measurements as the tier increases. Tier 1 is the simplest calculation of the guidelines published by the IPCC. Tier 2 and tier 3 are sometimes referred to as higher tier methods that provide results that can provide more accurate results than the tier below. Estimated values in higher tiers tend to be lower due to the greater complexity in higher tiers, for example by using sub-categories of existing tier 1 categories. Higher tiers also generally require greater resources for data collection, so it may not be feasible to use more rigorous sub-categories for each category. Therefore, the use of higher tiers requires identifying key categories that have the largest contribution to GHG emissions. By systematically and objectively identifying key categories, GHG inventory compilers can maximize the accuracy and cost-efficiency of data collection.

The choice of tier is highly dependent on the availability of data in a country. For tier 1, emission factor values have been provided by the IPCC in the Guidelines for National Greenhouse Gas Inventories. The emission factor values in the IPCC guidelines are divided by region or continent, namely North America, Latin America, Oceania, Western Europe, Eastern Europe, Asia, Africa, and the Middle East. The calculation of GHG emissions in Indonesia follows the IPCC guidelines for the Asian region. The data that needs to be provided by each



country to calculate CH₄ (methane) and N₂O (nitrous monoxide) emissions from livestock using tier 1 of the IPCC guidelines are only data on livestock population and body weight; and the value of the methane emission factor from feces provided in the IPCC guidelines. As for tier 2, the data required is not only population and emission factors. IPCC (2006) provides guidance that the simplest sub-category is based on age and production status, namely child, young, and adult sub-categories for ruminants; and seedling and meat categories for non-ruminants (poultry and pigs). Methane Emission Factor values from Enteric and Feces for Livestock in the Asian Region for the Tier 1 Method are as follows:

Table 1. Methane Emission Factor Values from Enteric and Feces for Livestock in the Asian Region for Tier 1 Method

Livestock	Digestion/Enteric Process (KgCH ₄ /head/day)	Manure/Feces (KgCH ₄ /head/day)	Total Emissions (KgCH ₄ /head/day)
Beef cattle	47.00	1.00	48.00
Dairy cattle	61.00	31.00	92.00
Buffalo	55.00	2.00	57.00
Sheep	5.00	0.22	5.22
Goats	5.00	0.20	5.20
Pig	1.00	7.00	8.00
Horse	18.00	2.19	20.19
Free-range chicken	-	0.02	0.02
Layer breeds	-	0.02	0.02
Broiler breeds	-	0.02	0.02
Ducks	-	0.02	0.02

Source: (Intergovernmental Panel on Climate Change, 2006)

The Central Bureau of Statistics (BPS), in the report “*Peternakan Dalam Angka: 2023*”, released data related to animal husbandry in Indonesia from 2016 - 2022 (Badan Pusat Statistik, 2023a). This report presents data on the livestock population in Indonesia until 2022. If the livestock population data is matched with the guidelines for calculating livestock methane emissions according to the IPCC tier 1 guidelines, then we will get an estimate of methane emissions from livestock in Indonesia based on the IPCC tier 1 method. However, the BPS report does not classify the age and production status of each livestock so it cannot be estimated using the tier 2 method due to the unavailability of key categories data. Although using tier 1 is less accurate than tier 2, its application is still used in almost all developing countries in the world (Aldrian et al., 2020). In addition to the use of the tier 1 method in Indonesia, it is still relevant because it is still used by government agencies, as stated by the Surabaya City Government in the report on “*Kajian Inventarisasi Gas Rumah Kaca (GRK) Kota Surabaya Tahun 2022*” (Dinas Lingkungan Hidup Pemerintah Kota Surabaya, 2022). Thus, the writing team will use the tier 1 method to calculate the estimation of *Burp Tax* potential on methane emissions from livestock in Indonesia. The following is data on total methane emissions and potential *Burp Tax* in Indonesia in 2022.

Table 2. Estimated Methane Emissions from Livestock Digestion Processes in Indonesia and Potential *Burp Tax* in 2022

Livestock	Number in 2022 (head)	Total Livestock Emissions 2022 (KgCH ₄ /year)	Potential <i>Burp Tax</i> - Carbon tax rate in the price ceiling law (IDR 30/kgCH ₄)	Potential <i>Burp Tax</i> - NZ rate (IDR1,160/kgCH ₄)
Beef cattle	17,245,043	295,838,712,665	8,875,161,379,950	343,172,906,691,400



Dairy cows	507,075	11,290,024,875	338,700,746,250	13,096,428,855,000
Buffalo	1,088,437	21,850,372,775	655,511,183,250	25,346,432,419,000
Sheep	14,063,214	25,665,365,550	769,960,966,500	29,771,824,038,000
Goats	18,556,875	33,866,296,875	1,015,988,906,250	39,284,904,375,000
Pigs	6,750,214	2,463,828,110	73,914,843,300	2,858,040,607,600
Horses	367,272	2,412,977,040	72,389,311,200	2,799,053,366,400
Total		393,387,577,890	11,801,627,336,700	456,329,590,352,400

Source: BPS, Processed (2023)

Based on Table 2, it is known that the total methane emissions from the digestive process of ruminant animals (cattle, buffaloes, sheep and goats) during 2022 is 393,387,577,890 KgCH₄. Gastroenteric emissions from beef and dairy cattle contributed 307,128,737,540 (78%) of the total methane emissions from ruminant animals. This shows the urgency of applying the Burp Tax to gastroenteric emissions in ruminant animals, especially beef and dairy cattle, which contribute the most to methane emissions. On this basis, the authors will focus on beef and dairy cattle as the main tax objects.

Then to calculate the potential of Burp Tax in Indonesia, the author team compiled two possible tariff schemes, which are as follows:

1. Equating to the carbon tax rate in accordance with Law No.7 of 2021 (UU HPP) which is Rp30/kgCH₄. This is based on the fact that CO₂ and CH₄ are fellow GHG emissions. So, in simple terms, the two can be equalized by considering the principles of equality and convenience of payment. In this scheme, it can be calculated that the maximum potential of Burp Tax with a tariff equalized with carbon tax is 11.8 Trillion Rupiah.
2. Using New Zealand's planned Burp Tax rate of Rp1,160/kgCH₄ (€0.067 approximately €1,160) as reported by the Irish Examiner (Cadogan, 2022). The tariff was calculated by US Department of Agriculture experts, using a modeling approach from the NGO Beef + Lamb New Zealand Ltd. Using this scheme, the rate that will be used by New Zealand, the potential Burp Tax in Indonesia could reach 456 Trillion Rupiah. This suggests that the Burp Tax potential is between 0.7-25% of the 2023 tax revenue target (1,718 Trillion Rupiah).

To maximize this potential, a fair taxation mechanism is needed so that the regular goals of reducing GHG emissions and state revenue can go together.

Burp Tax Implementation Scheme in Indonesia

After exploring the potential of Burp Tax in Indonesia and the current business process of beef and dairy cattle farming in Indonesia, the writing team will try to create a policy scheme for the implementation of Burp Tax in Indonesia consisting of Tax Subject, Taxpayer, Tax Object, Tariff, and Burp Tax collection mechanism. In formulating this taxation scheme, the writing team will try to formulate a policy that is in accordance with the principles of tax imposition pioneered by Adam Smith (Four Maxim) in order to ensure that the collection of Burp Tax is not merely to seek potential revenue but also to pay attention to aspects of justice and legal certainty.

Tax Subject

Tax subjects in Burp Tax are actors in the beef and dairy cattle farming sectors. Tax subjects, according to UU KUP, mainly consist of Individuals (OP) and Entities. In the context of this research, the tax subjects can be individuals and companies engaged in livestock breeding activities and beef cattle cultivation activities; companies engaged in livestock breeding activities, milk collection activities, and dairy cattle cultivation activities; and slaughterhouses (RPH) or slaughterhouses (TPH). Livestock business actors in the actual situation are more diverse than what the authors have mentioned earlier. Nevertheless, the



previously mentioned tax subjects can already show the potential application of Burp Tax which is the purpose of this study.

Taxpayer

Burp Tax subjects are OPs and Entities that are actors in the Beef Cattle and Dairy Cattle sector. In determining the Taxpayer (WP), of course there are various considerations such as the principle of fairness of tax collection for income redistribution (principle of equality). For this reason, in determining the taxpayer for a particular tax, it is necessary to have a threshold that serves as a benchmark for the financial capacity of the tax subject. Thus, the author team proposes the following Burp Tax WP criteria:

- Individual Taxpayer (WP OP)

The tax subjects for Burp Tax are individuals who own at least 30 head of cattle. This threshold is intended to avoid unfair taxation of farmers who lack financial capacity. Smallholder beef cattle farming is managed by rural communities with ownership of 1-2 cows with limited resources, making it vulnerable to various problems. (Amam & Harsita, 2021). We assess that Private OPs with a minimum limit of 30 cattle have sufficient financial capacity and resources to manage their livestock business so that the imposition of Burp Tax on these OPs can be considered appropriate. In addition, from the perspective of religion, especially Islam, farmers with a minimum of 30 cattle are required to pay Zakat on 1 head of livestock. In the Islamic perspective, a person is obliged to pay Zakat because his economic ability is above average so he is obliged to pay Zakat as an effort to help fellow Muslims. This argument can support the number of 30 heads to be used as the minimum number of cattle threshold in Burp Tax. Indeed, financial capability as defined by the state and religion are two different things. However, given that Burp Tax is still a conceptual taxation that has not been implemented in the world (even in New Zealand, the proponent country), we can use this limit as one of the options in determining the Burp Tax mechanism.

- Corporate Taxpayers

The Corporate Tax Subjects required for the Burp Tax Scenario are all companies in the field of livestock breeding activities and beef cattle cultivation activities as well as companies engaged in livestock breeding activities, milk collection activities, and dairy cattle cultivation activities. BPS data shows that the number of beef cattle and dairy cattle companies from all major activities in Indonesia in 2022, as shown in Table 3, amounted to 104 and 30 companies, respectively (Badan Pusat Statistik, 2023b).

Table 3. Number of Beef and Dairy Cattle Companies by Legal Entity in 2022

Legal Entity	Number of Beef Cattle Companies	Number of Dairy Cattle Companies
PT/CV/Firma	98	19
State-owned Enterprises	1	0
Cooperative (Koperasi)	2	6
Individuals	0	0
Foundation (Yayasan)	2	5
Others	0	0
Number of Companies	103	30

Source: BPS, Processed (2024)

Table 4. Number of Beef Cattle and Dairy Cattle Companies by Main Activity in 2022

Legal Entity	Number of Beef Cattle Companies	Number of Dairy Cattle Companies
Nursery	15	1



Cultivation	88	22
Cow Milk Collector	0	7
Number of Companies	103	30

Source: BPS, Processed (2024)

The total of 133 companies is dominated by entities in the form of Public Companies (PT) totaling 117 companies. In this case, the Ministry of Finance (MoF) can assign Burp Tax obligations to a total of 133 companies by position as has been done previously in the implementation of the PMSE VAT in the past. This will facilitate the assessment by the DGT of which companies have the greatest impact on methane contribution in Indonesia so that, if indeed the tax obligation is through a direct appointment mechanism by the Ministry of Finance, the process of monitoring the implementation of Burp Tax in Indonesia will be much easier and efficient in the costs incurred in collecting taxes (Efficient Principle).

Tax Object

The object of Burp Tax is gastroenteric methane produced by beef and dairy cattle. Methane produced by animal waste is not included in the scope of this taxation because its effect on the environment can be controlled through waste treatment. Cow manure can be used as a base for plant fertilizer or biogas while gastroenteric originating from burps and farts of livestock cannot be controlled for its negative externality effects on GHG effects. The role of Burp Tax is as a pigovian tax on the burps. Adding livestock manure as a Burp Tax object is counterproductive because in addition to increasing the tax burden for taxpayers, the imposition is not in accordance with the rules of pigovian taxation.

Tax Rate

In the previous section, the authors have tried to calculate the potential Burp Tax in Indonesia based on 2 tariff schemes, both of which apply specific tariffs. The first tariff is a tariff equal to the Carbon Tax of Rp30/KgCH₄ and the second tariff is Rp1,160/KgCH₄ in accordance with the planned tariff implementation in New Zealand. The tax rate scheme will certainly determine the amount of tax burden that will be borne by producers and consumers. The higher the tariff, the greater the tax burden that will be imposed on the final product and cause market imbalance. By comparing BPS data on the number of beef and dairy cattle with estimates of livestock methane emissions based on IPCC Tier 1, the following is an estimate of the tax burden per head of cattle each year.

Table 5. Estimated Tax Burden per Cow per Year

Livestock	Methane Gas from Digestion Process (KgCH ₄ /head/year)	Burp Tax Cost/Poultry/Year (Rate IDR 30/KgCH ₄)	Burp Tax Cost/Livestock/Year (Rate IDR1,160/KgCH ₄)
Beef Cattle	17,155	514,650	19,899,800
Dairy Cows	22,265	667,950	25,827,400

Source: BPS, Processed (2024)

From the table above, we know that when referring to the calculations prepared by the US Department of Agriculture experts (Cadogan, 2022) the tax burden on producers will increase dramatically. Mature slaughter cattle prices as of September 30, 2024 ranged from Rp9,500,000 for mature white females to Rp21,500,000 for mature limosin bulls (Taniku, 2024). The category of cattle considered mature is cattle that are approximately 18 months old (Anggraini & Sri Suharyati, 2016). If it is assumed that the cow has been farmed for 2 years and the tax burden is charged directly to the price of the cow, then under the first tariff scheme (Rp30/KgCH₄) the price of a mature limousine bull would be approximately Rp22,000,000. Under the second tariff scheme (Rp1,160/KgCH₄) the price of cattle would be approximately Rp61,000,000. The price of cattle increased to three times the actual price. This shows that the



imposition of the second tariff scheme, despite its high reliability as it is the result of research by experts at the US Department of Agriculture, is not suitable for Indonesia as it can cause market chaos. Taxes are not always related to the budget function alone. The effect of tax implementation should also be linked to its influence on economic activities. On the other hand, the first tariff scheme makes more sense to implement as the tax burden per head of cattle ranges from 5 - 10% of the cattle price. Applying the same Rp30/KgCH₄ rate as the Carbon Tax can be considered because methane and carbon are both classified as GHGs. Therefore, the methane and carbon tariff schemes can be equated. Based on this and in the context of this research, the authors will use the Rp30/KgCH₄ tariff scheme for the imposition of Burp Tax in Indonesia.

Tax Collection Mechanism

In the previous review, we learned that livestock methane emissions can be calculated using IPCC (2006) guidelines with tier 1, 2, and 3 methods. Method 1 is the most common and easiest method to use because it provides an estimate of the amount of methane emissions based on regional classifications in the world. The tier 2 method is the more complex method to use as it requires more complicated data collection but produces more accurate methane estimates that are usually lower than the estimates given in the tier 1 method. The data available in the BPS report, “*Peternakan Dalam Angka: 2023*”, only allows for calculating methane emissions of livestock using the tier 1 method. Based on this, the general mechanism for the Burp Tax implementation that the authors propose is as follows:

- Methane emissions that become the basis for tax calculation (DPP) for taxpayers, both OP and Badan, are calculated based on the IPCC tier 1 method. The taxpayer calculate the average annual number of livestock owned then calculate the amount of tax payable by applying the estimated emission factor and tax rate. The accuracy of the taxpayer's calculation will be verified again by the tax authorities and if needed the tax authorities can recalculate the amount of tax payable either through tax research or tax audit. In accordance with IPCC tier 1, the amount of methane emissions per cow for beef cattle is 17,155 KgCH₄ and for dairy cattle is 22,265 KgCH₄ per year. The average annual number of livestock is calculated based on the number of livestock each month divided by 12 months. By multiplying the rate of Rp30/KgCH₄ by the tier 1 emission factor and the average annual number of livestock, the tax payable can be found.

$$\text{Burp Tax} = \text{Average annual number of livestock} \times \text{Emission Factor} \times \text{Rate}$$

$$\text{Burp Tax} = \text{Average annual number of livestock} \times (17,155 \text{ or } 22,265) \times \text{Rp30}$$

- Taxpayers can use the IPCC tier 2 or tier method by calculating the amount of carbon emissions themselves using the tier 2 methane emission matrix provided by the Directorate General of Livestock and Animal Health (Dirjen PKH), Ministry of Agriculture. The IPCC tier 2 method calculation must be submitted to the DGT for verification. For this mechanism to work. The Ministry of Finance through the DGT must cooperate with the Ministry of Agriculture through the Directorate General of Livestock and Animal Health to provide the tier 2 methane emission matrix annually. The IPCC tier 2 calculation method takes into account fluctuations in livestock methane emissions that can change every year. This calculation matrix can be issued through the Decree of the Minister of Finance (KMK) every year which is equated to the issuance of KMK rates every month. So that the calculation of the amount of tax payable becomes:

$$\text{Burp Tax} = \text{Average annual number of livestock} \times \text{KMK Emission Factor} \times \text{Rp30}$$

- The average annual number of livestock is used as the basis for calculation because based on the research for WP business processes in the livestock business, it is known that the turnover of biological assets for each main activity in both beef cattle and dairy cattle farms varies. So to simplify the calculation of tax payable, it can use the average



number of annual livestock. Keep in mind that Burp tax is only imposed on livestock that are controlled, so the assumption of calculating the average number of livestock is needed. Taxpayers are required to report the calculation of the average annual number of livestock at the time of reporting to be verified by the DGT.

- Burp Tax payment and reporting is done annually and can be equated with the Annual Tax Return reporting period. For the sake of convenience, the author team will uniform the deadline for Burp Tax reporting at the end of the fourth month after the tax year (April 30) for both OP and Corporate Taxpayers. Based on the previous review, it has been explained that Burp Tax is sought to avoid smallholder farmers and is dominated by farms by Corporate Taxpayers. Therefore, for simplification, the author team recommends equalizing the reporting and payment period of Burp Tax for both OP and Corporate Taxpayers.
- Regulations related to administrative sanctions or fines for late reporting can adapt other types of taxation listed in the HPP Law. For example, for negligence in reporting, taxpayers can be subject to Rp1,000,000 which is equal to the fine for negligence in reporting the Annual Corporate Tax Return. Administrative Sanctions of delayed payment for each month can also be adjusted to the provisions of KUP, namely the rate according to KMK multiplied by the principal amount of tax payable each month.

Impact of Burp Tax Imposition in Indonesia

The additional costs incurred due to the additional Burp Tax policy will add to the long list of challenges faced by cattle farmers in Indonesia. The Burp Tax will certainly result in an increase in the price of livestock commodities such as meat and milk due to the increase in production costs.

Research conducted by (Mayulu & Saputra, 2023) related to the cost structure and income of beef cattle business in Kutai Kartanegara Regency, East Kalimantan. The author chose the research location as a benchmark for estimating production costs first because the East Kalimantan area according to BPS data in 2023 is an area with a small beef cattle population of 108,613 heads only, then areas outside Java have prices of goods that tend to be higher than areas in Java, therefore if you are going to analyze the impact of price increases, it is suitable for the area because a slight increase in production costs will have more impact on the condition of farmers. The study produced detailed data on the cost of beef cattle during one production cycle with ownership of 3-12 cows, as follows:

Table 6. Breakdown of Beef Cattle Farming Costs

Cost Type	Average (Rp/year)
1. Fixed Cost	
- Cage Repair	1,389,747
- Equipment Repair	422,084
2. Variable Cost	
- Feed and Concentrates	5,082,162
- Vitamins and Medicines	51,946
- Water and Electricity	169,592
- Labor	21,273,548
Total Cost	28,389,080

Source: Mayulu & Saputra (2023)

The data above is a breakdown of the average cost of cattle business with ownership of around 3-12 heads, but the amount of cost per cow is unknown, because the cost is an accumulation incurred by the farmer until the cow can be sold. However, in the study, the costs were juxtaposed with the revenue from the sale of 4-5 cows, so the author used the assumption



that the costs were the costs used to care for 5 cows. With this assumption, it was found that the range of costs incurred for 1 cow for one year was around Rp5,677,816.

As for the cost data of dairy cows, the author took a benchmark dairy cattle business in Pelalawan Regency, Riau, which according to BPS data in 2023, has a dairy cattle population of 53 heads only. Dairy cattle cost data is quoted from research conducted by (Hendri, 2021) which displays the following cost data:

Table 7. Breakdown of Dairy Farming Costs

Component	Total Cost (Rp/head)
Production Cost	6,422,396.97

Source: Hendri (2021)

However, the study did not explain the details of the costs so that only the total amount of costs incurred is known. Then the following is an estimate of the increase in production costs that must be borne by cattle farmers in Indonesia if the Burp Tax policy is implemented:

From Table 3, it is known that the additional cost for each type of cattle is Rp514,650 for beef cattle and Rp667,950 for dairy cows. Reviewing the amount of beef cattle maintenance costs that must be incurred by farmers is \pm Rp5,677,816 so in one year. Then if added with the Burp Tax cost, the total cost that must be borne by beef cattle farmers for one year is \pm Rp6,192,466 per cow. Meanwhile, for dairy farmers, the total cost that must be borne for one year with the addition of Burp Tax is \pm Rp7,090,346.

Based on the simulation, the addition of Burp Tax to production costs can be said to be quite significant, especially if it is imposed per cow where in one year farmers do not only spend on one cow, so it can be estimated that the cost expenditure is quite burdensome, especially for small farmers who still have a small to medium business scope.

First, it is difficult to obtain data related to the average national production costs incurred by farmers in Indonesia, so the data used as a reference for the simulation is partial production cost data in one region of Indonesia taken according to the author's subjectivity considerations. Secondly, in relation to data on the production costs of dairy cows in Indonesia, it is also not possible to find production cost data that has been detailed as in the beef cattle data so that it cannot be known what the cost components are. These limitations mean that the simulation of the cost increase calculation cannot be said to be accurate but is expected to be close to accurate.

In addition, the Burp Tax implementation scheme itself does not target small-scale smallholder farms, but farms owned by companies or individuals with a minimum cattle ownership of 30 heads that are considered to have better and more stable financial capabilities, so that the increase in production costs does not have too much impact on the business process and profitability of cattle farming.

Burp Tax, which results in increased production costs, can also have an impact on increasing commodity prices. In 2022 alone, world cattle prices are already lower than domestic cattle prices. The world beef price in 2022 is around Rp87,000 per kilogram, while the domestic beef price is around Rp90,000 - Rp135,000. The price of beef in Indonesia is high compared to other countries, so if the Burp Tax is imposed, it could result in higher domestic beef prices. The following is a simulation of the calculation of the increase in beef commodity prices if the Burp Tax is imposed.



Table 8. Estimated Increase in Beef Commodity Prices

Type of Cattle	Average weight of one cow	Carcass Quantity (per head)	Total Meat Production Per Tail	Burp Tax (Rp)	Estimated Price Increase (IDR)
			40%-50% x cow weight	75% x Total Carcass	Emission yield per head for 24 months x rate of Rp30/kg
Beef Cattle	400 kg	180-220 kg	135-165 kg	1,015,200	7,520

Source: Anwar (2023), Processed

The price increase caused by the Burp Tax may result in a decrease in domestic beef demand because before the Burp Tax, the price of domestic meat commodities was already higher than the world price of beef, and with the Burp Tax, the difference between the price of local meat and the average world price of meat is even greater, which could reduce the income prospects of livestock businesses.

The impact is that the supply of local livestock commodity production is decreasing while domestic demand for meat and milk remains or even tends to increase, so the government will take the path of increasing the number of imports of these livestock commodities to meet domestic demand and needs. The increase in the number of beef imports will, at a macro level, suck up more of the country's foreign exchange. Based on data in the Ministry of Agriculture's Beef Livestock Commodity Outlook 2022, during 2021-2022 beef imports have used 800-900 million US\$ of foreign exchange. If farmers reduce the number of their cattle as a result of the increase in production costs due to the Burp Tax, it will also increase the portion of foreign exchange used for beef imports to cover the shortage of beef supply in Indonesia.

Then from the milk commodity sector produced by dairy cows, the price of raw pure cow's milk commodity in Indonesia in 2023 is around Rp11,000-18,000. The price increase caused by the implementation of Burp Tax can be considered not too significant so that it does not affect the consumption of pure milk products in Indonesia.

Tabel 9. Estimated Price Increase of Cow's Milk Commodity

Type of Cattle	Average weight of one cow	Total Milk Production (Tail/day)	Total Milk Production (Year)	Burp Tax (Rp)	Estimated Price Increase (IDR)
				Emission yield per head for 24 months x rate of Rp30/kg	Burp Tax / Total Production (1 liter = 1.03 kg of milk)
Dairy Cows	400 kg	10-12 liters	3650 liters	1,317,600	350.47

Source: Processed (2024)

CONCLUSIONS

Conclusions

The imposition of Burp Tax on livestock businesses can reduce the negative externalities arising from the release of methane gas from the digestive process of cows.



Considering that cows are the largest methane gas emitters compared to other livestock, and methane gas itself is more harmful to the environment than other greenhouse gases. In line with Indonesia's commitment to achieve zero emission by 2060, Burp Tax is a regular mechanism that can be considered, similar to carbon tax.

In Indonesia, there is great potential in the imposition of Burp Tax so that in addition to being a form of effort to reduce methane emissions from beef and dairy cattle farms, Burp Tax can also increase the portion of state revenue from the taxation sector. A tariff scheme of Rp30/KgCH₄ with tax subjects in the beef and dairy cattle farming sector, including individuals with an ownership threshold of 30 cows and business entities, is the Burp Tax mechanism proposed in this proposal. However, it should also be noted that the imposition of Burp Tax may bring impacts in the form of increased complexity of cost recording and increased production costs for cattle farmers as well as increased commodity prices for meat and milk from cattle farming businesses in Indonesia.

Research Limitations

This analysis has limitations related to the availability of national livestock operational cost data that is difficult to obtain, so that the calculation simulation as presented in the discussion section has the subjectivity of the author's team because the simulation is carried out based on the data obtained with the adjustment of certain criteria. Secondly, this study assumes that the Burp Tax is treated the same as VAT, which is charged to the last consumer, thus affecting commodity prices, while there are many other mechanism considerations by taking into account other factors that can be obtained through a more thorough and in-depth study.

Implications

The implementation of Burp Tax has great potential, but in its implementation, the Directorate General of Taxes and the Fiscal Policy Agency must conduct a collaborative assessment and study of the livestock industry to reach the sensitivity of Burp Tax policy implementation across disciplines associated with economic aspects for cattle industry players in Indonesia. Future research is recommended to cover a broader study by conducting case studies in several regions in Indonesia and considering other aspects that have not been covered in this research, due to the different conditions of the livestock industry in the Indonesian region.

REFERENCES

- Aldrian, E., Puspawardoyo, S., & Haryanto, B. (2020). *Emisi Gas Rumah Kaca dari Peternakan di Indonesia dengan Metode TIER 2 IPCC* (M. Sidik, Ed.; Vol. 1). LIPI Press. <https://www.researchgate.net/publication/338964653>
- Amam, & Harsita, P. A. (2021). Profil Usaha Peternakan Sapi Potong Rakyat di Kabupaten Jember Provinsi Jawa Timur. *JAMI: Jurnal Ahli Muda Indonesia*, 2(1), 1–12. <https://doi.org/10.46510/jami.v2i1.53>
- Anggraini, S., & Sri Suharyati (2016). Status Reproduksi Dan Estimasi Output Berbagai Bangsa Sapi Di Desa Sriwedari, Kecamatan Tegineneng, Kabupaten Pesawaran. *Jurnal Ilmiah Peternakan Terpadu*, 4(1), 47–54. <https://media.neliti.com/media/publications/233224-status-reproduksi-dan-estimasi-output-be-bade66fd.pdf>
- Antara. (2021, September). *Guru Besar IPB: Gas Metana dari Sendawa Sapi Berdampak pada Pemanasan Global*. <https://Tekno.Tempo.Co/Read/1507120/Guru-Besar-Ipb-Gas-Metana-Dari-Sendawa-Sapi-Berdampak-Pada-Pemanasan-Global>.
- Anwar, I. C. (2023, June). *Cara Menghitung Daging Sapi Hidup: 1 Ekor Berapa Kg?* <https://Tirto.Id/Cara-Menghitung-Daging-Sapi-Hidup-1-Ekor-Berapa-Kg-GMoT>.



- Badan Pusat Statistik. (2023). *Peternakan Dalam Angka 2023*. <https://www.bps.go.id/id/publication/2023/12/22/5927b06e1dcde219f76cec59/peternakan-dalam-angka-2023.html>
- Badan Pusat Statistik. (2023, July). *Jumlah Perusahaan Peternakan Ternak Besar dan Kecil Menurut Badan Hukum/ Usaha, 2021-2023*. Bps.Go.Id. <https://www.bps.go.id/id/statistics-table/2/MzQ5IzI=/jumlah-perusahaan-peternakan-ternak-besar-dan-kecil-menurut-badan-hukum--usaha.html>
- Badan Pusat Statistik. (2023, Juni). *Jumlah Perusahaan Sapi Perah Menurut Badan Hukum/Usaha, 2021-2022*. Retrieved from Badan Pusat Statistik: <https://www.bps.go.id/id/statistics-table/2/MzQwIzI=/jumlah-perusahaan-sapi-perah-menurut-badan-hukum-usaha.html>
- BMKG, S. B. I. G. R. K. (2022). *Buletin Gas Rumah Kaca (Volume 02 Number 02)*. BMKG: https://iklim.bmkg.go.id/bmkgadmin/storage/buletin/Buletin%20Gas%20Rumah%20Kaca%20Vol%202%20No%202_BMKG.pdf
- Breathelife2030. (2021, August). *Emisi Metana yang Menyebabkan Perubahan Iklim: Berikut Cara Mengurangnya*. <https://Breathelife2030.Org/Id/News/Methane-Emissions-Driving-Climate-Change/>.
- Cadogan, S. (2022, July). *Pajak bersendawa' di Selandia Baru menyebabkan biaya pada peternakan sapi perah besar lebih dari €11.000 per tahun*. <https://www.Irishexaminer.Com/Farming/Arid-40919510.html>.
- Cahyono, B. (2021). Asas Pemungutan Pajak Dalam Pajak Penghasilan Transaksi Saham di Bursa. *Journal of Tax and Business*, 2(2), 75–83. <https://doi.org/10.55336/jpb.v2i2.36>
- Coutinho, M. C. (2001). Adam Smith on Public Expenditure and Taxation. *Nova Economia*, 11(2), 11–30. <https://ideas.repec.org/a/nov/artigo/v11y2001i2p11-30.html>
- Dinas Lingkungan Hidup Pemerintah Kota Surabaya. (2022). *Kajian Inventarisasi Gas Rumah Kaca (GRK) Kota Surabaya Tahun 2022*. <https://lh.surabaya.go.id/fileupload/ebook/Laporan%20GRK%202022.pdf>
- Handayani, R. (2023, May). *Mengenal Pajak Pigouvian: Jenis dan Manfaat*. <https://Www.Pajak.Com/Pajak/Mengenal-Pajak-Pigouvian-Jenis-Dan-Manfaat/>.
- Hendri. (2021). Analisis Pendapatan, Daya Saing dan Dampak Kebijakan Pemerintah Terhadap Usaha Peternakan Sapi Perah Rakyat di Kabupaten Pelalawan. *JIP (Jurnal Industri Dan Perkotaan)*, 17, 1–8. <https://garuda.kemdikbud.go.id/documents/detail/2265828>
- Hutchins, R. M. (1952). Great books of the western world (W. Benton, Ed.; Vol. 48). *Encyclopaedia Britannica*.
- IEA. (2023, February). *Pelacak Metana Global 2023*. <https://Www.Iea.Org/Reports/Global-Methane-Tracker-2023#overview>.
- Intergovernmental Panel on Climate Change. (2006). Emissions From Livestock and Manure Management. In *IPCC Guidelines for National Greenhouse Gas Inventories (pp. 72–82)*. https://www.ipccnggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_10_Ch10_Livestock.pdf
- Lefevre, T. A. (2016). *Justice in Taxation*. 41, 763. <https://ssrn.com/abstract=2792393>
- Mayulu, H., & Saputra, D. (2023). Analisis keuntungan usaha peternakan sapi potong. *Jurnal Ekonomi, Manajemen, dan Akuntansi*, 25(1), 64-70. <https://doi.org/10.30872/jfor.v25i1.12323>
- Parker, K. (2021). “Cow-nting Down”: *Regulatory Measures to Reduce New Zealand's Biogenic Methane Emissions*. <https://www.mfe.govt.nz/publications/environmental->
- Putri, A. M. H. (2023, March). *RI Jadi Penyumbang Besar Gas Metana Dunia, Sang Perusak Ozon*. <https://Www.Cnbcindonesia.Com/Research/20230306045715-128-419041/Ri-Jadi-Penyumbang-Besar-Gas-Metana-Dunia-Sang-Perusak-Ozon>.



- Smith, A. (2002). An Inquiry into the Nature and Causes of the Wealth of Nations. In N. W. Biggart (Ed.), *Readings in Economic Sociology* (pp. 6–17). Wiley. <https://doi.org/10.1002/9780470755679>
- Taniku. (2024, September). *Harga Sapi hari ini Tanggal 30 September 2024*. Taniku.Kulonprogokab.Go.Id. <https://taniku.kulonprogokab.go.id/siganak/sapi>
- Wikipedia. (2021, February). *Pajak Pigouvan*. https://Id.Wikipedia.Org/Wiki/Pajak_Pigovian.