Technical report on :
Taxation for Sugar Sweetened Beverages in Sri Lanka

World Health Organization

Sri Lanka

Technical report on: Taxation for Sugar Sweetened Beverages in Sri Lanka, 2017

Contents

Glossary

Ad valorem tax: A tax that is applied to the monetary value of the good involved in a transaction.

Non-sugar sweetener/ non- nutritive or non- caloric sweetener: A food additive (other than a mono- or disaccharide sugar), which imparts a sweet taste to a food. Technological purposes for this functional class includes: sweetener, intense sweetener, bulk sweetener. It should be noted that products like sugars, honey and other food ingredients that can be used to sweeten are not associated with the term "sweetener.

Nutrient profiling: The science of classifying or ranking foods according to their nutritional composition for reasons related to preventing disease and promoting health.

Own-price elasticity of demand: The percentage of change of demanded quantities of a good, when the price of such good increases by 1%, keeping everything else constant.

Regressivity: The extent to which the burden of a tax is proportionally higher for people on lower incomes, and/or represents a lower percentage of a higher income earner.

Specific excise: A fixed amount tax applied to the quantity or another quantifiable characteristic of a good (e.g. amount of sugar) involved in a transaction.

Substitution: An effect caused by a rise in price that induces a consumer (whose income has remained the same) to buy more of a relatively lower-priced good and less of a higher- priced one

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Sugar-sweetened beverages: Sugar-sweetened beverages (SSB) are defined as all types of beverages containing free sugars. These include carbonated or non-carbonated soft drinks, fruit/vegetable juices and drinks, liquid and powder concentrates, flavoured water, energy and sports drinks, ready-to-drink tea, ready-to-drink coffee, and flavoured milk drinks.

Value-added tax: Tax applied on each stage of production/commercialization on the surplus value, added to the price at each stage of production/commercialization.

Executive Summary

Noncommunicable diseases (NCDs) cause more than 75% of all deaths and nearly 20% of premature deaths in Sri Lanka, with serious socio economic consequences to both individuals and state. Overweight and obesity, fuel by diets high in sugars and fat, and physical inactivity are significant contributor to NCDs, with rising trends of overweight and obesity in both children and adults. Presently, 5-6% of school children are overweight; a third of adult females and nearly a fifth of adult males are overweight and 10 % suffer from diabetes mellitus.

A contributor to high sugar diets is the intake of sugar-sweetened beverages (SSBs). The Sri Lanka global school health survey (2017) reports that, 26.5% of children consume a carbonated beverage one or more times/day. Each year in Sri Lanka, an estimated 52,000 years of health life are lost due to consumption of SSBs. Considering a per capita GDP at a market price of Rs 539,398 (2015), every year, about Rs 28 billion are lost due to SSB consumption. The purchasing power of wages is increasing faster than SSB prices and that, together with extensive marketing of SSBs likely causes of increased consumption. While overall consumption of SSBs is low compared to data from other countries, the increasing consumption trends are of concern, and should be addressed. Analysis of the Household Income and Expenditure survey data 2013 show that poorer urban households spend more on SSBs than on fruits, milk and healthcare combined.

Over the past decade, convincing evidence has emerged of the importance of fiscal measures to curb consumption of SSBs. It is one of the policy options proposed by the World Health Organization (WHO). WHO's Global and Regional action plans on NCDs and on nutrition propose that countries consider taxation to incentivize healthy dietary choices as appropriate to the national context.

This report has been developed by WHO at the request of the Hon. Minister of Health, Government of Sri Lanka, to provide technical assistance to implement fiscal policies to reduce SSB consumption.

The report provides the following information:

-   Global evidence of best practices in SSB taxation.
-   Analysis of health effects, costs of SSB consumption,
    expenditure and consumption.
-   Effects of alternative specific excise taxes on SSB prices,
    consumption and fiscal revenue
-   Processes and data needs for monitoring and evaluation of an excise tax.

The report also recommends that the specific tax should be automatically adjusted annually to nominal economic growth (combination of inflation and real economic growth).

The importance of public awareness regarding the SSB tax and its objectives to both enhance its acceptance and complement its intended impact to reduce SSB consumption and improve public health is emphasized.

Report Preparation

This report has been developed by WHO Country Office for Sri Lanka, WHO Regional Office for South-East Asia and Prof Guillermo Paraje, Professor of Economics, Business School, Universidad Adolfo Ibáñez, Santiago de Chile (Consultant, WHO), supported by WHO HQ. Information from stakeholder discussions held during the WHO mission in Sri Lanka to provide technical support for SSB taxation and prioritize specific policy actions during the time period 14-18 August 2017 have been taken into consideration in the report.

Data Limitations

The data used in this proposed is limited and may not include all of the SSBs. However, data included can be taken as a proxy for total SSBs consumption.

1. Background

1.1 Overweight, obesity and its consequences

Obesity and overweight is one of the leading risk factors for non-communicable diseases (NCDs), with an explosive increase over the last few decades. According to the WHO Global status report on non-communicable diseases 2014, obesity has almost doubled between 1980 and 2014 and 11% of adult men and 15 % of women being reported as obese (1). The Joint monitoring data of WHO, UNICEF and World Bank estimates that , 41 million children under the age of 5 years were estimated to be overweight in 2016 (2). In Sri Lanka, the prevalence of overweight and obesity is a low 0.5 % in children under 5 years of age. The prevalence increases during school age, to reach 5-6 % by the Year 10[i]. The age-standardized prevalence of overweight and obesity in adult males was 24.5 % and 34.4 % in females in 2014 [ii] (up from 19.6% and 30.4%, respectively, in 2010). [iii] Figure 1 shows the trends in overweight for school children and women aged 15-49 years of age and both overweight and obesity in adult males.

Figure 1: Trends in prevalence of overweight and obesity among different age groups
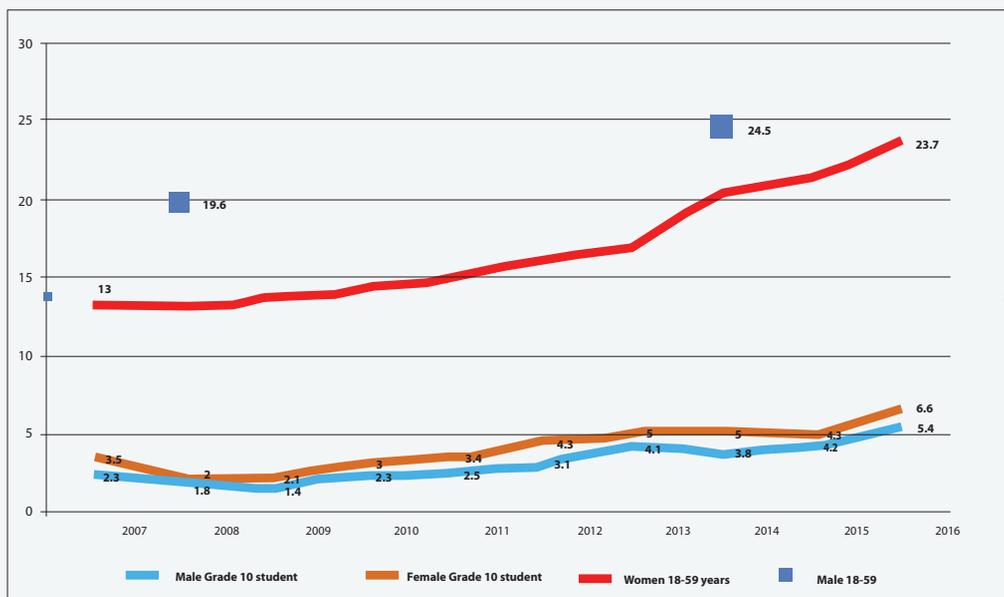
SOURCE: AUTHORS BASED ON NUTRITION MONTH DATA, MINISTRY OF HEALTH, STEPS DATA 2014 AND 2008, AND RHIMS DATA.

[i] Nutrition month data, Ministry of Health (2007-2016), RHMIS, Ministry of Health (2007 -2016)
[ii] Non Communicable Diseases Risk Factor Survey, Sri Lanka 2015. Ministry of Health, Nutrition and Indigenous Medicine and World Health Organization.
[iii] Non communicable Disease Risk Factor Survey Report, Ministry of Healthcare and Nutrition Health Sector Development project/World Bank. August 2008.

The age-standardized prevalence of diabetes in the same group was 9.7%. Both diabetes and cardiovascular diseases, are responsible for significant morbidity and mortality in Sri Lanka. The current health expenditure on all NCDs amounts to Rs 91.6 billion, 35.2 % of the total current health expenditure (3).

1.2 Cost of obesity

Obesity is one of the major drivers of preventable chronic diseases and leads to healthcare costs. Obesity is associated with other costs: productivity, transportation, and human capital costs. Job absenteeism (productivity costs due to employees being absent from work for obesity-related health reasons) and 'presentism' (lower productivity while at work) create significant costs for employers (4). A study by the Asian Development Bank estimate in 42 Asians and Pacific countries including Sri Lanka, the direct cost was USD 35,800,00, 1.45% over the total healthcare cost and 0.05% of DGP due to additional medical expenditure. And the indirect cost was USD 82,300,000 , 3.32% over total of health cost and 0.12% of DGP due to high morbidity and mortality of overweight and obese patients.

1.3 Sugar sweetened beverage taxes: policy context

The scientific evidence relating the consumption of sugar sweetened beverages (SSBs) disclosed negative health outcomes is vast and has been accumulating over the last decade.[iv] A 2007 systematic review found that SSB consumption was associated with an increase in caloric intake, beyond the levels contributed by the said beverages and an increase in body weight (6). In addition, it found negative associations (moderate but significant) between the consumption of SSBs and certain staple foods like milk and indispensable nutrients like calcium. There is also some evidence of a positive relationship between SSB consumption and Type 2 diabetes mellitus. These associations points toward a significant increase in future health system costs associated with overweight/obesity, in relation to SSB consumption (7).

WHO guideline on sugars intake for adults and children, 2015 recommends reducing the intake of free sugars to less than 10% of total energy intake, approximately 12 teaspoons of sugars per day, based on poor health outcomes of excess sugars intake including overweight, obesity and poor dental health. Furthermore, it recommends a further reduction to below 5% of total energy intake, or about 6 daily teaspoons, for additional health benefits.[v]

Among the determinants of overweight and obesity in Sri Lanka, diets high in sugar, salt and fat are a significant factor with consumption of energy dense

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[iv] Sugar-sweetened beverages (SSBs) are beverages containing added caloric sweeteners, such as sucrose, high-fructose corn syrup, or fruit-juice concentrates. These include, but are not limited to, carbonates, fruit drinks, sports drinks, energy and vitamin water drinks, sweetened iced tea, and lemonade. Fiscal Policies for Diet and Prevention of Non-Communicable Diseases Technical Meeting Report 5–6 May 2015, Geneva, Switzerland
[v] World Health Organization. Guideline; Sugars intake for adults and children. Geneva: WHO, 2015.

starches and added sugars increasing in Sri Lanka (8). A 2010 assessment of the Global, Regional, and National Disease Burdens related to SSB consumption, estimated that the global burden of disease that can be directly associated to SSB consumption is staggering (9). In the case of Sri Lanka, the study estimates that 1.1% of DALYs (about 52,000 years) are a direct consequence of SSB consumption. Of those, 50% are DALYs for cardiovascular diseases, while 45% are DALYs for diabetes.[vi] About 1,000 deaths per year close to 2 of all deaths among the population aged 20 years or more were also directly related to SSB consumption. The situation is even worse in certain age groups. As a fact, 4.6% of deaths in age group 20-44 is directly related to SSB are due to diabetes.

Another analysis measured global, regional and national consumptions of SSBs, fruit juices and milk (10). The study reported that, the intake of SSBs, which is close to 1 serving per day in the adult population, is more than double the average intake for South East Asia; and almost double the intake for low-middle income countries and global averages.

These figures are supported by data on Sri Lankan adolescents, which reported that 82% of the sample (17-year-old adolescents) consumed sugar-sweetened soft drinks at least once per week, while 77% and 48% consumed sugar-sweetened carbonated drinks and sugar- sweetened fruit drinks at least once per week (11). Data from the Global school based health survey for Sri Lanka further supports these findings with 26.5 % of school children aged 13-17 years reporting that they consumed a carbonated soft drink at least once per day.

[vii] SSB taxation is one of the menu of population based options proposed by WHO to influence consumer behaviours and reduce the dietary risk of NCDs.[viii] Others include implementing

- recommendations on marketing of foods and non-alcoholic beverages to children.

- school and other settings based interventions to reduce intake of salt, sugar and fat.

- food labelling, specifically interpretative front of pack labelling on pre-packaged foods and promoting product reformulation.

- mass media campaigns to raise awareness and advocate for healthy dietary behaviours. These actions are most effective when used in an integrated manner to address all underlying drivers and barriers to a healthy diet.

The recently updated Appendix 3 of the global Action Plan for the prevention and control of NCDs has recommended reducing sugar consumption through taxation on SSBs with a cost effectiveness ratio of > 1$ 100 per DALY averted. As with

[vi] Close to 5.6% of all DALYs for diabetes are linked to SSB consumption, while 2.9% of total DALYs for cardiovascular diseases are linked to SSBs consumption.
[vii] 2016 Global School-based student health survey. Sri Lanka
[viii] Best buys' and other recommended interventions for the prevention and control of noncommunicable diseases updated (2017) appendix 3 of the Global action plan for the prevention and control of noncommunicable diseases 2013-2020

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tobacco and alcohol, taxation has been proposed as an effective tool to decrease SSBs consumption (1, 7). Unlike tobacco and alcohol, that do not have healthy substitutes, fiscal tools to decrease SSBs consumption can include subsidies to healthy alternatives, such as subsidizing fruit or vegetables in schools, potable water and promoting improved eating behaviours.

1.4 Taxing SSBs: global experiences

The negative health results of SSB consumption have led to the proposing of economic measures – essentially taxes and subsidies – to reduce SSBs consumption.

A recent systematic review and meta-analysis on the effect of prices on the consumption of SSBs revealed an overall own-price elasticity (i.e., the percentage of demand reduction when faced with a 1% price increase) of -1.3 for SSBs (12, 13). This indicates a relatively high effectiveness of taxes in curbing consumption, keeping everything else constant.

Some studies have contextualized the potential effectiveness of taxes on SSBs. Using data for 19 countries, a study suggests that taxes on SSBs may be more effective in reducing obesity prevalence where existing obesity prevalence and soft drink consumption levels are high (14). The same study also states that countries with no or low levels of taxation are those where gains in obesity reduction are most important (keeping everything else constant).

[ix]Among middle income countries, the case that has received most attention is Mexico, mainly because the extremely high burden of disease associated with an unusually high consumption of SSBs.

Here, the own-price elasticity for SSBs and cross-price elasticity with milk (i.e., the percentage of demand reduction of milk when faced with a 1% price increase in SSBs) was estimated (15). Significant negative own-price elasticity was found for SSBs that increases over time (from -0.6 in 1989 to -1.1 in 2006).

The immediate impact of Mexico's enactment of an SSBs tax in late 2013 was to decrease SSBs purchases by an average of 6%, while a year later, a 12 % decrease was reported (16). All socioeconomic groups reduced purchases of SSBs, though reductions were higher among the poorer households. Purchases of untaxed beverages increased by 4%, mainly driven by an increase in purchases of plain bottled water.

[ix] In the case of Sri Lanka, as it will be shown, the potential gains from taxation would be large, as the country does not have any taxation to SSBs.

In South Asia, an economic-epidemiological study with data from India estimated demand elasticities for SSBs and certain substitutes (milk, coffee, tea, and fresh fruit juices) (17). The study simulates the change in calorie consumption, with overweight and type 2 diabetes mellitus as outcomes based on a specific epidemiological model for India (the authors

recognized the uniqueness of India, such as the impact of BMI on chronic diseases). The elasticity estimates obtained using two-stage models are around -0.94. Thus, a moderate increase SSB tax could produce substantial reductions in overweight, obesity and the prevalence of diabetes mellitus.

1.5 Effect of taxes on prices, consumption and fiscal revenue

Effects of taxes on prices, consumption of the taxed goods and fiscal revenues depend on a number of considerations.

Own-price elasticity: if it is greater than one (in absolute values) mean that increase in price would have a corresponding decrease in quantities that are more than proportional, keeping everything else constant. In terms of public health, the more elastic the demand, the more effective the increase in taxes. On the other hand, in terms of public revenues, an elastic demand means that in increase in taxes can reduce fiscal revenues (once taxes are already in place).

Tax base: Ceteris paribus, a product is more price elastic (i.e. demand for it will decrease more if its price increases) if the product is defined broadly (i.e. the definition includes many similar substitute products, e.g. orange juice is generally less elastic than fruit juice since a consumer can buy another type of fruit juice if the price of orange juice rises). Given the large amounts of beverage substitutes for SSBs, it is expected SSBs to be relatively price elastic.

Proportion of household expenditure: A specific product can also be more price elastic if expenditure on that product takes a relatively large share of person/household budget (which is, generally, not the case for SSBs, though, as will be shown, for certain groups of the population budget share allocated to SSBs can be relatively high).

Tax pass through rate: Increase in taxes usually imply an increase in consumer prices. However, consumer prices are set by supplying companies and such prices depend on costs, taxes and the competitive landscape of markets. Thus, the proportion by which taxes are passed to consumers (i.e. the 'pass-through rate') is unknown when deciding the tax rate.

It is unlikely, however, that passing the taxes to the consumer is depends on the decision of the companies, decide not to pass taxes to consumers (at least in the long term) based on evidence for other countries.

In the case of Mexico, taxes not only are fully passed-through to consumers, but there is an over-shifting of taxes (where prices increase more than the tax) in carbonated SSBs (18, 19). In France, the SSB tax was fully passed to consumers (20), while in the case of the soda tax in Berkeley (USA), the tax pass-through for SSBs varied in degree and timing by store type and beverage type", as pass-through was complete in large chain supermarkets and small chain supermarkets and chain gas stations, partial in pharmacies and negative in independent corner stores and independent gas stations (21).

1.6 Types of taxes

The second, key, consideration is the type of tax that is to be imposed. Typically, there are two types of excise taxes that could be imposed on SSBs. An ad-valorem tax: the tax rate is a percentage of the purchasing value of the beverage. An example is Chile's SSB tax that has a rate of 18% of the price used as a tax base.[x] Though this type of tax decreases SSBs consumption, it incentivizes consumers to down-trade to relatively cheaper brands. Thus, though it may increase the price of SSBs relative to other goods (making its consumption less desirable) it decreases the price of cheaper brands relative to more expensive ones, favouring the down-trading.[xi] If the goal of the tax is to decrease absolute consumption of SSB, an ad-valorem tax only partially achieves that.

A specific tax: the tax rate is constant by a relevant chosen unit (e.g., volume content of the SSB; sugar content by 100 ml; etc.). For instance, Mexico SSB tax that is $Mex 10 per litre. Similarly, specific taxes have been implemented in France, Hungary, Ireland, United Kingdom, a number of US cities, the Philippines, among others. Though in all of these cases, the tax is applied on a specific volume of the SSB, the same tax could be applied on the sugar or caloric content of the SSB. In fact, studies find (as economic theory predicts) that the largest effect in terms of reduced intake of calories and sugar are obtained by applying the tax on sugar content in all SSBs (22).

Specific taxes, either on volume or sugar content, reduce the incentive to down-trading, as prices of cheaper SSBs relative to more expensive ones, increase, as the vast evidence on similar taxes on tobacco shows (23-25).

Though specific taxes are more effective in curbing consumption, they can lose effectiveness in context of high inflation, especially if they are set in fixed monetary terms (e.g., USD 1 per litre). Inflation decreases over time the real impact of the

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[x] In the case of Chile, for instance, the tax is collected on the consumer price, including VAT. Thus, a litre of taxed SSBs that costs CLP 100, including VAT, will pay an ad-valorem tax of CLP 18.

[xi] Assuming, for instance, that a 20% ad-valorem tax is imposed and that a litre of SSB brand A that costed Rs 100, increases to Rs 120; while a litre of SSB brand B that costed Rs 200, increases to Rs 240. While the price of A, relative to B, remains constant (the ration between both prices), consumers will try to substitute SSB brand B that increased Rs 40, for SSB brand A that increased only Rs 20.

excise on consumption, unless it is changed periodically to account for inflation. On the other hand, specific taxes can be cheaper to administer, since they reduce the risks of undervaluation of the tax base, for instance, by under-invoicing (i.e. declaring a consumer price below the actual price at which the good is sold).

An important effect of both types of taxes is that they incentivize industry to reformulate to products with lower sugar content. Specific taxes on sugar content of SSBs may be more effective than ad-valorem taxes or specific taxes on volume content in promoting reformulation.

xii Assuming, for instance, that a Rs 20 per litre, specific tax is imposed and that a litre of SSB brand A that costed Rs 100, increases to Rs 120; while a litre of SSB brand B that costed Rs 200, increases to Rs 220. Both products increase by the same amount, but the price of A, relative to B (the ration between both prices), increases from 0.5 before the imposition of the tax, to 0.55. Consumers will try to substitute both products, as nominal prices of both increase, as the relative price of the cheapest.

2 Situation analysis on household expenditures and consumption of SSBs in Sri Lanka

2.1 Monthly expenses and budget shares on SSBs

Information on household expenditures is available from the last Household Income and Expenditure Survey (HIES) collected in 2012-13. This survey collects nationally representative information on expenditures by type of goods, income and several socio- demographic variables. In total, 20,583 households register positive expenditures in the sample (see Annex A).

Table 1: Monthly expenses and budget shares for relevant categories for urban households with SSB consumption. HIES 2012-13

Variable	Quintile 1		Quintil 2		Quintil 3	
	Average	Std. Deviation	Average	Std. Deviation	Average	Std. Deviation
Monthly Expenditure on Food and Beverages	LKR 8,896	LKR 2,338	LKR 13,617	LKR 2,886	LKR 18,421	LKR 4,392
Budget Share Food and Beverages	62.76%	0.146	60.66%	0.119	59.20%	0.141
Monthly Expenditure on Vegetables	LKR 590	LKR 398	LKR 1,024	LKR 490	1115.922	537.668
Budget Share Vegetables	4.27%	0.032	4.56%	0.022	3.6%	0.018
Monthly Expenditure on Fruits	LKR 143	LKR 245	LKR 294	LKR 329	712.099	993.646
Budget Share Fruits	0.98%	0.016	1.31%	0.015	2.3%	0.035
Monthly Expenditure on SSBs	**LKR 482**	**LKR 364**	**LKR 513**	**LKR 408**	**LKR 538**	**LKR 414**
Budget Share on SSBs	**3.59%**	**0.029**	**2.29%**	**0.018**	**1.73%**	**0.013**
Monthly Expenditure on non-alcoholic non SSBs	LKR 59	LKR 260	LKR 11	LKR 64	LKR 6	LKR 54
Budget Share on non-alcoholic non SSBs	0.33%	0.014	0.05%	0.003	0.02%	0.002
Monthly Expenditure on Milk and dairy products	LKR 289	LKR 434	LKR 785	LKR 594	LKR 1,404	LKR 981
Budget Share on Milk and dairy products	2.07%	0.030	3.48%	0.027	4.53%	0.032
Monthly Expenditure on Health	LKR 72	LKR 283	LKR 238	LKR 505	LKR 432	LKR 617
Budget Share on Health	0.42%	0.016	1.02%	0.022	1.36%	0.019
Monthly Expenditure on Education	LKR 118	LKR 277	LKR 305	LKR 490	LKR 853	LKR 1,291
Budget Share on Education	0.80%	0.019	1.37%	0.022	2.70%	0.041

Variable	Quintil 4		Quintil 5		Total	
	Average	Std. Deviation	Average	Std. Deviation	Average	Std. Deviation
Monthly Expenditure on Food and Beverages	LKR 22,318	LKR 5,979	LKR 29,222	LKR 9,537	LKR 24,242	LKR 9,570
Budget Share Food and Beverages	50.74%	0.134	32.89%	0.149	43.95%	0.183
Monthly Expenditure on Vegetables	LKR 1,262	LKR 691	LKR 1,807	LKR 1,263	1478.445	1053.599
Budget Share Vegetables	2.87%	0.016	2.08%	0.016	2.7%	0.019
Monthly Expenditure on Fruits	LKR 924	LKR 1,042	LKR 1,556	LKR 1,419	1144.553	1281.136
Budget Share Fruits	2.08%	0.024	1.65%	0.015	1.8%	0.021
Monthly Expenditure on SSBs	**LKR 539**	**LKR 391**	**LKR 780**	**LKR 527**	**LKR 656**	**LKR 483**
Budget Share on SSBs	**1.22%**	**0.009**	**0.87%**	**0.006**	**1.26%**	**0.012**
Monthly Expenditure on non-alcoholic non SSBs	LKR 83	LKR 685	LKR 72	LKR 452	LKR 62	LKR 482
Budget Share on non-alcoholic non SSBs	0.20%	0.017	0.07%	0.006	0.11%	0.010
Monthly Expenditure on Milk and dairy products	LKR 1,807	LKR 1,303	LKR 2,299	LKR 1,536	LKR 1,882	LKR 1,441
Budget Share on Milk and dairy products	4.09%	0.029	2.67%	0.021	3.32%	0.027
Monthly Expenditure on Health	LKR 870	LKR 1,496	LKR 2,790	LKR 5,269	LKR 1,707	LKR 3,975
Budget Share on Health	1.93%	0.032	2.50%	0.038	2.03%	0.034
Monthly Expenditure on Education	LKR 1,390	LKR 2,147	LKR 4,405	LKR 8,365	LKR 2,716	LKR 6,286
Budget Share on Education	3.10%	0.048	4.24%	0.070	3.43%	0.059

Monthly average expenditures and budget shares for selected categories of goods for urban households consuming SSBs are tabulated in Table 1. Households are categorized into five quintiles, according to their total monthly expenditure. The households in the highest quintile on food and beverages which counts for 20% with highest monthly total expenditure (20% with highest monthly total expenditure) spend 3.3 times as much as those in the lowest quintile (20% with lowest monthly total expenditure). Thus, the budget share allocated to food and beverages in the highest quintile group is considerably lower than the average.

In terms of SSB expenditure, the average budget share is 1.3% of total expenditures. For urban households in quintile 1, that share increases to 3.6%. Though it may appear low, such a share is allocated by these households for expenditures on fruits; vegetables; milk and dairy products; and healthcare combined. Figure 2 shows the extent of these expenditures by poorer urban households and for the total population.

Figure 2: Budget shares for relevant categories for urban
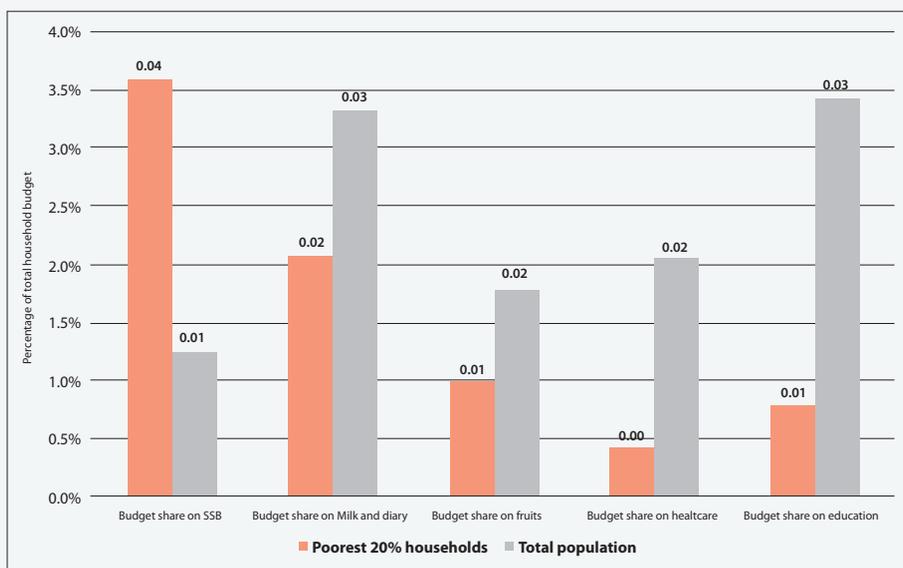
2.2 Regressivity

In order to consider the marginal effect of socio-economic variables in the decision to consume (or not) SSBs a simple logistic regression model was run (details given in Table 7, Annex A). The dependent variable was taken as, the decision to consume any SSB (1) or not (0). Independent variables were quintiles of total monthly expenditure; sex, education and ethnicity of household head; district of residence; existence of minors in household (under 18); and availability of drinking water. The model shows that households from higher quintiles are far likelier to consume SSBs (eight times more likely than households from Quintile 1). Other relevant variables to explain SSB consumption are education of household head (the more educated the household head, the more likely is the household to consume SSB); ethnicity of household head (Sinhala households are more likely to consume SSB than Tamil); availability of drinking water (households with drinking water are less likely to consume SSB); having minors at home (households with minor have a larger probability of consuming SSB); etc.

Even though prices of beverages are not considered in the model (there is no information on prices in the HIES) it is clear that relatively well-off households are those who have a higher probability of spending on SSBs. Taxing these goods, that are purchased more intensively (in quantity) by richer households imply that tax revenues will primarily come from richer households. Though poorer households spend relatively more on SSB, they likely have a higher sensitivity to price increases (i.e. a more elastic demand) and would be more willing to substitute taxed goods by non-taxed ones. In this sense, the SSB tax would not be regressive.

2.3 Real prices and affordability

The first condition to consumption If the goal of public policy is to deter SSB consumption, the instrument has to decrease the affordability of these goods. A product is less affordable when increasing resources have to be devoted to its purchase. Affordability is lower if, given households incomes, real prices of SSB increase.

The monthly evolution of real prices of SSBs in Colombo is shown in Figure 3. The figure shows that the average price of SSB relative to the basket of goods included in the overall Consumer Price Index (CPI) which includes SSBs, has had two periods. From 2010 to mid- 2014 there was an increase in real prices; while real prices are constant from that point onwards. Overall, real prices are between 10%-15% higher in 2014 than at the beginning of 2010.
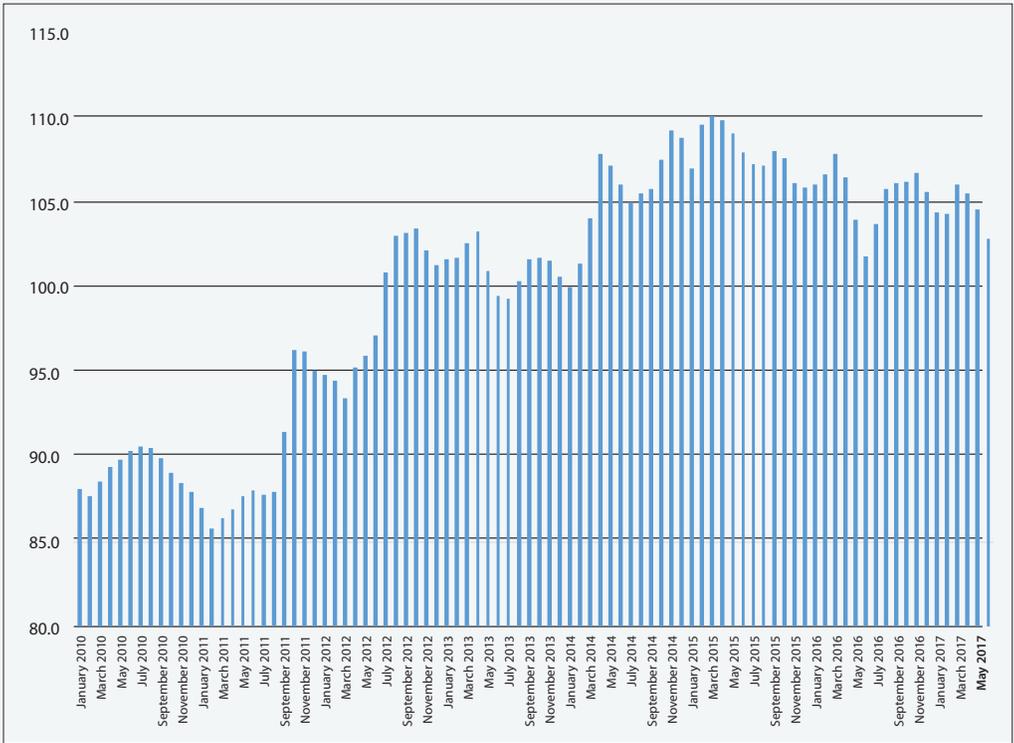
Figure 3: Real price of SSBs in Colombo (January 2014=100)

However, the household incomes are not constant and wages and other monetary incomes increase with time. If, for instance, wages increase more than SSB prices, households would need less working time (e.g. minutes or hours of work) to buy a unit of SSB. In that case, affordability would decrease and households will have the economic incentive to buy more SSB.

Figure 4 shows the evolution of affordability considering the evolution of nominal wages in agriculture and in the informal sector from 2010 to May 2017 as examples. As can be seen, in both cases there are strong fluctuations. For informal workers, SSB were relatively equally affordable until mid 2014 and since then have become more affordable, the reason being, that average wages in this sector have outpaced the increase in SSB prices. In the case of agriculture workers, though there is not a clear trend, at the end of the period considered, SSB were marginally less affordable.
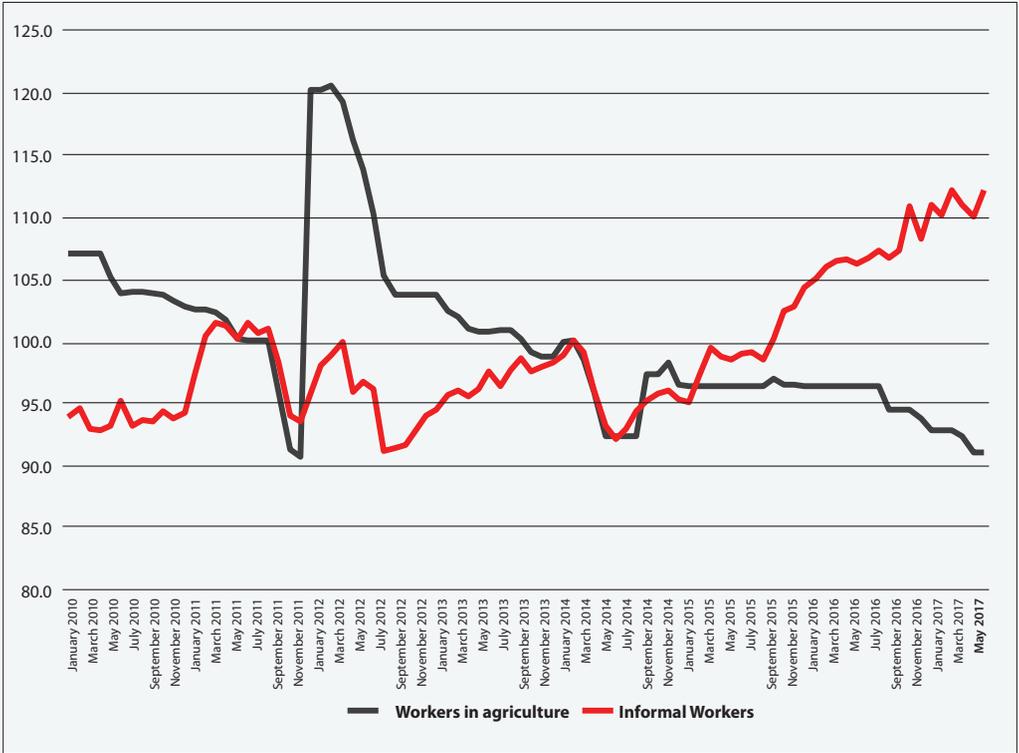
Figure 4: Affordability of SSBs based on agriculture and informal sector wages (January=2014)

Figure 5 shows the evolution of affordability considering central government and teachers' wages using data for 2014-2017. Both series move almost perfectly paired and they show that SSB have been increasingly more affordable in this period. The increase in affordability has been significant (about 20%) by the end of the period. This ensures that, the workers in these sectors have to work about 20% less time to buy the same amount of SSB.
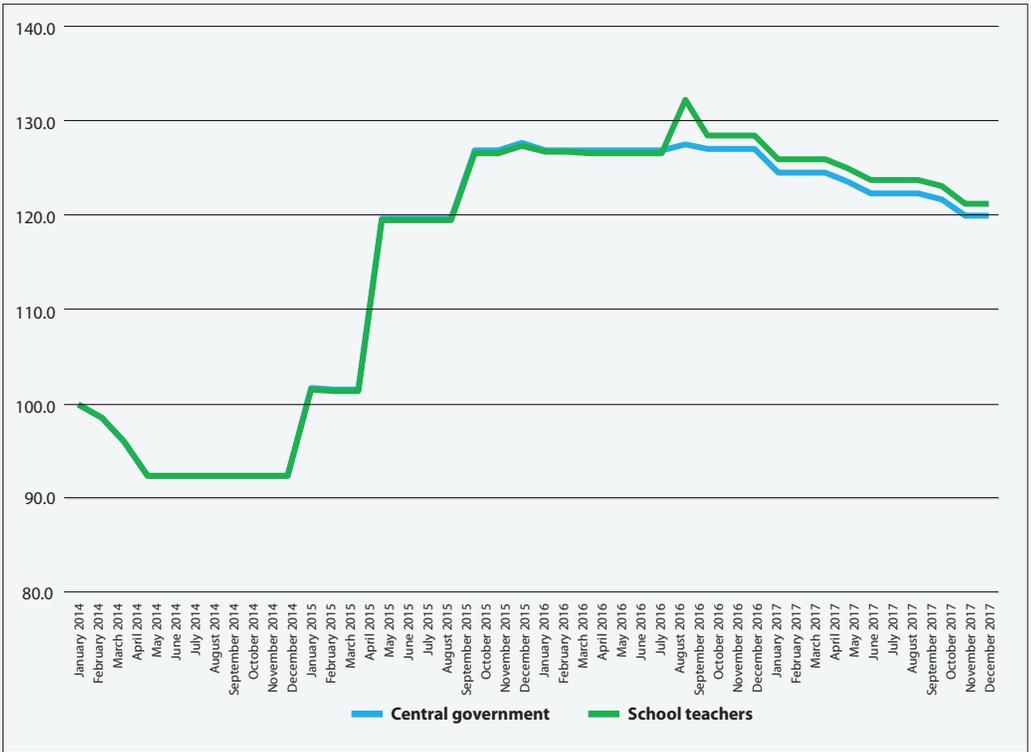
Figure 5 : Affordability of SSBs based on central government and school teachers' wages (January=2014)

2.4 Consumption and sales of SSBs in Sri Lanka

The data used for consumption and sales of SSBs in Sri Lanka are based on an Euromonitor International report, 2014 (26). [xiii] [xiv]SSB consumption has been growing at significant rate (26).[xv] While Sri Lanka's annual average per capita GDP growth between 2009 and 2013 was 6.5%, annual average growth rate of SSB consumption was 7.5%. The average growth rate of per capita SSB consumption

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xiii While every attempt has been made to ensure accuracy and reliability, Euromonitor International cannot be held responsible for omissions or errors of historic figures or analyses.

xiv Euromonitor data was used for consumption and sales since it were not possible to collect comprehensive data from local sources within the given timeframe.

xv Euromonitor classification of carbonates and juices differs marginally from the Sri Lanka nutrient profile model description. Therefore, some small differences may be seen when assessing revenue.

Table 2 : Consumption, sales and average price of SSB by type (2009-2013); forecast for 2014-2017

Million litres	2009	2010	2011	2012	2013	2014	2015	2016	2017	Annual average growth 2009-2013	Annual average growth 2014-2017
Bottled Water	2.3	3.6	3.8	4	4.4	4.9	5.5	6	7	18%	13%
Carbonates	62	65	69	72	78	81	85	89	94	6%	5%
Concentrates	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Juice	13	16	19	22	25	29	33	37	42	18%	13%
RTD Coffee and Tea	2.7	2.7	2.8	2.8	2.8	2.8	2.9	2.9	2.9	1%	1%
Sports and Energy Drinks	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	57%	10%
Total volume	**80.4**	**87.7**	**95.1**	**101.3**	**110.7**	**118.3**	**127**	**135.6**	**146.6**	**8%**	**7%**

Million Rs	2009	2010	2011	2012	2013	2014	2015	2016	2017	Annual average growth 2009-2013	Annual average growth 2014-2017
Bottled Water	92	170	210	281	323	392	489	626	775	33%	19%
Carbonates	5287	5766	6412	8294	9683	10967	12778	15142	17480	13%	11%
Concentrates	1149	1244	1437	1786	1937	2220	2583	3058	3648	11%	12%
Juice	2069	2487	3206	4466	5681	6789	8564	10774	13376	25%	19%
RTD Coffee and Tea	345	407	486	689	775	1044	1223	1602	1976	19%	20%
Sports and Energy Drinks	333	373	420	549	620	692	802	1019	1216	13%	13%
Total sales	**9276**	**10447**	**12173**	**16065**	**19018**	**22104**	**26440**	**32221**	**38471**	**20%**	**20%**

Rs/litre	2009	2010	2011	2012	2013	2014	2015	2016	2017	Annual average growth 2009-2013	Annual average growth 2014-2017
Bottled Water	40	47	55	70	73	80	89	104	111	16%	11%
Carbonates	85	89	93	115	124	135	150	170	186	10%	11%
Concentrates	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Juice	159	155	169	203	227	234	260	291	318	9%	11%
RTD Coffee and Tea	128	151	174	246	277	373	422	552	681	21%	22%
Sports and Energy Drinks	833	933	840	1097	1239	1153	1337	1456	1737	10%	15%
Weighted average price per litre in Rs	**101**	**105**	**113**	**141**	**154**	**168**	**188**	**215**	**238**	**11%**	**12%**

Figure 6 : SSBs Consumption per capita (2009=100)
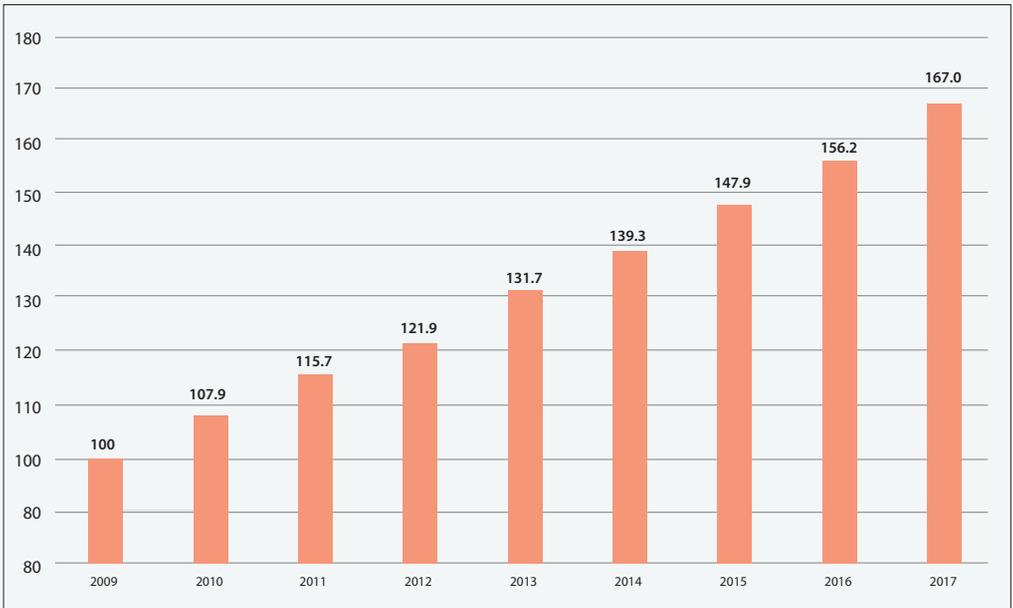
According to Euromonitor International, 2013, sales data of last year purchases, Sri Lanka about 78 million litres of Carbonates (the largest category of SSB according to volume), 25 million litres of Juice, and 2.8 million litres of Ready-to-drink (RTD) coffee and tea. Carbonate sales were worth 9.7 billion rupees, while Juices and RTD coffee and tea

sales were worth 5.7 billion rupees and 775 million rupees, respectively.[xvi] Average prices, estimated as the ratio of total sales over volume sold was equal to Rs 124 for Carbonates, Rs 227 for Juices and Rs 277 for RTD coffee and tea.

Euromonitor International makes projections for volume and sales for the 2014-2017 period, which will be used here. For instance, for 2017 the forecasted sales volume for Carbonates, Juices, RTD coffee and tea, and Sports and Energy Drinks are 94 million litres; 42 million litres; 2.9 million litres; and 0.7 million litres, respectively. Average prices of SSB are expected to increase by 12% over the 2014-2017 period, with RTD coffee and tea showing the largest price increase (22%) and Carbonates and Juices showing the lowest (11%). Actual data from nominal price increases for SSB from the Sri Lanka Department of Census and Statistics shows that between January 2014 and June 2017, prices have already increased by 17%, Therefore the Euromonitor forecast can be regarded as a very conservative prediction, at least for prices.

Regarding sales too, the Euromonitor forecast may be seen as conservative, especially for Sport and Energy drinks, the category with the highest average prices. Table 3 shows net imports of SSB during 2016. Though the data for other SSB is too aggregated to be able to obtain any relevant conclusion, imports of Sport and Energy drinks during 2016 were 921,329 litres, above Euromonitor forecast of 700,000 litres. Thus, for the simulations of tax scenarios, the actual volume of net imports for 2016 will be used for this category, as the base assumption of consumption of this category of SSB.

Table 3 : Imports and exports of SSB during 2016

Imports for 2016				
HS	Description	Litres	CIF Value	CIF Value per litre
22021000	Waters, including mineral waters and aerated waters, with added sugar or sweet or flavour	867,651	112,427,919	129.6
22029030	Beverages put up for sale as energy drinks	1,180,206	334,932,424	283.8
22029090	Other	923,459	129,764,142	140.5

Exports for 2016				
HS	Description	Litres	CIF Value	CIF Value per litre
22021000	Waters, including mineral waters and aerated waters, with added sugar or sweet or flavour	520,360	65,099,525	125.1
22029030	Beverages put up for sale as energy drinks	2,130	271,812	127.6
22029090	Other	19,346,398	1,944,145,098	100.5

Net imports for 2016				
HS	Description	Litres	CIF Value	CIF Value per litre
22021000	Waters, including mineral waters and aerated waters, with added sugar or sweet or flavour	347,291	47,328,394	136.3
22029030	Beverages put up for sale as energy drinks	921,329	129,492,330	140.5
22029090	Other	- 19,346,398	- 1,944,145,098	100.5

SOURCE: AUTHORS BASED ON DATA PROVIDED BY SRI LANKA CUSTOMS

[xvi] Original data in Euromonitor report is in million US dollars. Sales were transformed into rupees using average annual exchange rate estimated by the Sri Lanka Central Bank (available at http://www.cbsl.gov.lk/pics_n_docs/_cei/_docs/er/Monthly%20Average%20Exchange%20Rates.xls)

2.5 Tax policy simulations for Sri Lanka

2.5.1 Current tax structure on SSBs

As discussed previously, to decrease SSB affordability as a way of decreasing consumption, taxes have to increase SSBs real prices. Differentially affect SSB prices would sustain this process. Excise taxes could ensure this, while general taxes, such as VAT do not affect real prices, as it affects prices of all goods in the same proportion. Currently in Sri Lanka, there are no excise taxes on SSBs.

SSBs that are nationally produced are taxed by two general taxes levied by the Central Government:

a) the Value-Added Tax (VAT) is levied on most goods (all food and beverages are taxed with VAT) at a single rate of 15%. As in most countries, the tax base for the VAT is the net value added in each stage of the production/commercialization of the product.

b) the National Building Tax (NBT) is levied on goods in all stages of the commercialization chain (manufacturer, wholesale, retail). The tax base is the value of the good at each stage of the commercialization. The rate for the NBT in the case of SSB is 2% or on the manufacturer price, wholesale or retail price.

Import tariffs are a tool that governments use to raise revenue, but also to influence the balance of trade. Higher import tariffs are likely to protect domestic manufacturers by making imported substitutes more expensive relative to domestically produced goods, however, they are not necessarily going to result in lower overall consumption. As such, raising import tariffs on SSBs are unlikely to change consumption patterns, but rather simply encourage substitution to domestic products as well as greater domestic production of SSBs over imported SSBs.

In the case of imported SSBs, there is a general duty of 30% applied on the CIF value of the good. Over this duty, there are two specific import taxes. The first one is the "Cess" which has a rate of 35% or a minimum value of Rs 110 per litre for SSBs, but also for waters, aeriated waters and other waters not containing added sugar or other sweetening matter or flavouring.

The other import tax is the "Excise (Special Provisions) Levy", at the amount of Rs 12 per litre for "waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavoured" and "beverages put up for retail sales as 'Energy drinks'". The tax base of this tax is the CIF value of goods.

On top of the import duties described above, imported SSBs have also to pay VAT and NBT at the same rates than locally produced goods. It is important to note that some beverages, such as "Mineral waters" have to pay the Port and Airport Development Levy (PAL) with a tax of 7.5%, applied on the CIF value of the imported goods. Most SSBs are exempted from the PAL, which involves a price distortion favouring SSB over mineral waters (the healthier option).

2.5.2 Scope of SSB tax in Sri Lanka

Excise taxes are discriminatory taxes, applied to a specific set of products. Usually excise taxes are applied to luxury products, with a purely fiscal purpose, i.e. to generate revenue. Or, excise taxes are applied to products with negative externalities (goods which have social costs of consumption that exceed private costs of consumption). In these cases, the main purpose of excises is to induce behaviour changes (e.g.: excises on tobacco or alcohol). Excise taxes can be applied as a specific tax or ad-valorem tax, as discussed previously.

Since there are no studies for SSBs demand own-price elasticity for Sri Lanka three different values for it will be assumed. One, conservative, is that SSB own-price elasticity is equal to - 0.8 (i.e., a 1% increase in SSB relative price leads to a 0.8% decrease in SSB consumption); the other is that SSB own-price elasticity is equal to -1 (i.e. a 1% increase in SSB relative price leads to a 1% decrease in SSB consumption). Finally, a -1.1 own-price elasticity value (i.e. a 1% increase in SSB relative price leads to a 1.1% decrease in SSB consumption) is assumed. The evidence available for low/middle income countries is consistent with the above assumptions (27).

2.5.3 The tax base

The tax base for the SSB tax in Sri Lanka would include the following categories, as per the nutrient profile model:

   a) All water-based flavoured drinks carbonated and non-carbonated.
   b) Sport, energy, and electrolyte drinks.
   c) Ready-to-drink form coffee, coffee substitutes, tea, herbal infusions in or calculated as ready to drink form.
   d) Cereal, grain and tree nut-based beverages produced from the extracts of cereals, beans, pulses and tree nuts beverages.

100% fruit and vegetable juices prepared from direct extraction or reconstituted from the concentrate; milk and dairy based drinks with added sugar (where the sugars are lactose and galactose) would be excluded from the tax base. Products where non-sugar sweeteners have been added would also be exempt from the SSB tax.

2.5.4 Excise tax on SSBs

Two different excise tax scenarios are simulated (two other alternative scenarios are presented in Annex B). The first tax scenario is the introduction of a specific tax per volume similar to the one introduced in Berkeley (USA). The second, preferred scenario, is the introduction of a specific tax per sugar content. The first option seeks to penalize the consumption of larger quantities of SSBs (giving incentives to quit consumption, reduce or to consume SSBs in smaller containers), while the second one seeks to directly penalize sugar consumption (providing incentives to quit consumption, reduce it or to substitute high-sugar SSBs for low-sugar SSBs). A strong tax administration system is required to make this option work well

The volume-based specific tax

The results of the simulations for a volume-based specific tax of Rs 1.40 per ounce are presented in Table 4 (this amount is equivalent to a specific tax of Rs 47.5 per litre, which is a 20% increase on the average 2017 price for SSBs). This table shows, for each value of the own-price demand elasticity the expected increase in SSBs prices (if the pass-through rate is 1), the change in consumption and the implied increase in tax revenues.[xvii]

This tax would increase average prices by 25% in carbonates , its consumption would decrease between 19 million and 26 million litres, and the tax revenue would increase between 3.2 billion and 3.5 billion Rupees, depending on the demand elasticity value. In the context of Concentrates[xviii] the average price would increase by 15%, its consumption would decrease between 5 million and 7 million litres, with an extra tax revenue between 1.7 billion and 1.75 billion Rupees and RTD coffee and tea the increase in average price would be 7%, while the decrease in consumption would be about 0.2 million litres, with an increase in tax collection between 127 million and 130 million Rupees. Finally, average price of Sports and Energy drinks would increase about 3%, consumption would remain almost unaltered and tax collection would increase by about 42 million Rupees. Overall, SSB consumption would decrease between 24 million and 33 million litres, and tax revenue would increase between 5 billion and 5.5 billion Rupees.

[xvii] All scenarios in all simulations presented assume that the supply of SSBs has an own-price elasticity equal to infinity (i.e. the supply curve is flat). Though this assumption is unrealistic (at least in the short-run) it provides a conservative scenario for tax revenues (it is likely that tax revenues will be higher than those presented in the different tables); though it gives an optimistic scenario for changes in prices and consumption (it is likely that those changes will be smaller than those presented in the different tables). If the pass-through rate is higher than one (a probable scenario given the international experience in these types of taxes) it would be expected that actual changes in prices and consumption will be similar to those simulated.

[xviii] Euromonitor classification of concentrates includes cordials and like products which are categorised under water based flavoured beverages in the Sri Lanka nutrient profile model Therefore, some small differences may be seen when assessing revenue.

Table 4. Volume-based specific tax of Rs 1.40 per ounce

Specific tax of about Rs 1.40 per ounce							
Price elasticity of demand	Current consumption (million litres)	Current average price	% Increase in price	New average price	% Change in consumption	Change in consumption (million litres)	Tax revenues (in million Rupees)
Carbonates							
-0.8	94.0	186.0	25%	233.3	-20%	19.1	3556.6
-1.0	94.0	186.0	25%	233.3	-25%	23.9	3329.4
-1.1	94.0	186.0	25%	233.3	-28%	26.3	3215.7
Concentrates (liquid or solid) (*)							
-0.8	42.0	318.5	15%	365.8	-12%	5.0	1758.2
-1.0	42.0	318.5	15%	365.8	-15%	6.2	1698.9
-1.1	42.0	318.5	15%	365.8	-16%	6.9	1669.2
RTD Coffee and Tea							
-0.8	2.9	681.4	7%	728.7	-6%	0.2	130.1
-1.0	2.9	681.4	7%	728.7	-7%	0.2	128.2
-1.1	2.9	681.4	7%	728.7	-8%	0.2	127.2
Sports and Energy drinks							
-0.8	0.9	1737.1	3%	1784.5	-2%	0.0	42.8
-1.0	0.9	1737.1	3%	1784.5	-3%	0.0	42.6
-1.1	0.9	1737.1	3%	1784.5	-3%	0.0	42.5

(*) CALLED "JUICES" IN EUROMONITOR'S REPORT

A sugar concentration based specific tax

The results of the simulations for a sugar-based specific tax of Rs 1 per gram/100 ml, above an initial threshold of 6 gr/100 ml are presented in Table 5. 6 g/100 ml is taken as an initial reference threshold and can be modified subsequently.[xix] Average sugar content of SSBs is considered for each category of drink.

Table 5 shows that for carbonates this tax would increase average prices by 27%, its consumption would decrease between 20 million and 28 million litres, and the tax revenue would increase between 3.1 billion and 3.5 billion Rupees, depending on the demand elasticity value. For concentrates, the average price would increase by 19%, its consumption would decrease between 6 million and 9 million litres, with an extra tax revenue between 1.5 billion and 1.7 billion Rupees. Related to RTD coffee and tea the increase in average price would be 10%, while the decrease in consumption would be about 0.2 and 0.3 million litres, with an increase in tax collection between 122 million and 126 million Rupees. Finally, average price of Sports and Energy drinks would increase about 3%, consumption would remain almost unaltered, and tax collection would increase by about 42 million Rupees. Overall, SSB consumption would decrease between 27 million and 37 million litres, and tax revenue would increase between 4.9 billion and 5.4 billion Rupees.

[xix] This amount of sugar is approximately equivalent to the sugar content of a king coconut natural juice.

Table 5. sugar-based specific tax of Rs 1 per gram/100 ml, above an initial threshold of 6 gr/100 ml

Specific tax of Rs 1 per gram of sugar (over 6 gr) per 100 ml							
Price elasticity of demand	Current consumption (million litres)	Current average price	% Increase in price	New average price	% Change in consumption	Change in consumption (million litres)	Tax revenues (in million Rupees)
Carbonates (11 gr of sugar)							
-0.8	94.0	186.0	27%	236.0	-22%	20.2	3505.1
-1.0	94.0	186.0	27%	236.0	-27%	25.3	3265.0
-1.1	94.0	186.0	27%	236.0	-30%	27.8	3144.9
Concentrates (liquid or solid) (12 gr of sugar) (*)							
-0.8	42.0	318.5	19%	378.5	-15%	6.3	1694.6
-1.0	42.0	318.5	19%	378.5	-19%	7.9	1619.4
-1.1	42.0	318.5	19%	378.5	-21%	8.7	1581.8
RTD Coffee and Tea (13 gr of sugar)							
-0.8	2.9	681.4	10%	751.4	-8%	0.2	126.4
-1.0	2.9	681.4	10%	751.4	-10%	0.3	123.6
-1.1	2.9	681.4	10%	751.4	-11%	0.3	122.2
Sports and Energy drinks (11 gr of sugar)							
-0.8	0.9	1737.1	3%	1787.1	-2%	0.0	42.8
-1.0	0.9	1737.1	3%	1787.1	-3%	0.0	42.5
-1.1	0.9	1737.1	3%	1787.1	-3%	0.0	42.4

(*) Called "Juices" in Euromonitor's report

2.6 Arguments against taxation

Two main arguments are usually given against taxing specific goods. The first is that taxing specific goods may be regressive, as relatively poorer households may spend a higher budget share on these goods. It is evident that Sri Lanka, the poorer urban households spend relatively more on SSBs than richer households (see Table

1). However, there are counter arguments that favour taxation:

a) SSBs are non-essential goods, with widely available healthy substitutes (e.g. potable water) and with own-price demand elasticities that are plausibly above 1 (in absolute terms). Therefore, given an increase in SSB taxes, people are willing to decrease consumption more than proportionally, also decreasing the budget share allocated to these products. Moreover, it is highly plausible (in line with economic theory) that price elasticities are higher for poorer households, as has been shown for other developing countries (28, 29).

b) Consumption of SSBs has negative health consequences that may have a greater effect on poorer households. Though healthcare coverage is universal in Sri Lanka, households incur in out-of-pocket expenditures (see Table 1) that may put these households in situations of financial distress. Thus, higher SSBs taxation would imply less negative health consequences and, as a result, a lower probability of incurring out-of-pocket expenditures on health.

The second common argument against taxation is related to job losses. It is argued that by taxing these industries jobs will be destroyed, causing economic difficulties to those who lose their employments. However, there is evidence that this is not so:

a) Money not spent on the taxed beverages will be spent on non-taxed beverages and other products. While there would be lower demand for the taxed beverages and related job losses in this sector, as consumers reallocate their spending to non-taxed beverages and other goods and services, new jobs will be created in these sectors, as has been demonstrated in other countries (30). In Sri Lanka, beverage manufacturing firms (including those that produce non-SSBs and alcoholic beverages) have, on average 49.5 persons engaged and 48.2 employees.[xx] The rest of the industrial sector excluding the beverage-producing firms, have on average, 55.3 persons engaged and 53.2 employees. Therefore, when the industrial sector is considered (i.e. not including services, that are usually more labour-intensive than industries), resources saved from SSBs and spent on industrial goods would, quite likely, imply a net creation of jobs.

b) Taxing SSBs provides an incentive to manufacturers to re-formulate products, lowering their sugar content. Though this process may take time, once it is achieved, it would imply that no jobs are lost, as new products with increased consumption will compensate for a decrease in SSBs with higher sugar content.

Overall, there is no serious argument against SSB taxation, as these taxes will imply saving current and future resources for households and society, while producing a likely creation of new jobs.

2.7 Monitoring and evaluation

If a tax on SSBs is implemented, it is essential to monitor implementation, progress and health impacts of such a policy. As mentioned previously, the implementation of a specific tax reduces the costs of implementation (vis-à-vis an ad-valorem tax), as the tax agency has only to gather information on volume produced and sugar-content of SSBs produced. While controlling volume production may be straight-forward, verifying sugar-content may imply sampling and analysing periodically, beverages that are sold.

[xx] Data based on firms of the industrial sector with 5 or more people engaged (Table 5.4 of the 2015 Annual Survey of Industries). Data correspond to 2014 (last available year).

To monitor the progress of taxation, collection of specific data and a multisectoral coordinated effort is necessary.

a) Systematic collection of data on SSBs prices and volume sold, as well as data on changes in the formulation of products. (Ministry of Health, Department of Census and Statistics)

b) Verification procedures for sugar content of products would need to be designed and implemented. (Ministry of Health, Consumer Affairs Authority).

c) Collection of data on domestic production and imports is needed. For both cases, more disaggregated classifications than the ones currently used are necessary. For instance, imports, exports and domestic production data should be disaggregated to give information on SSBs separately form waters, natural juices, etc. (Ministry of Health, Department of Census and Statistics)

d) On imported products, clearly defined sub categories for Harmonized systems of Coding (HS codes) would have to be created. To create sub categories, a specific list of defined beverages would need to be provided to customs authorities by the Ministry of Health.

Finally, for the monitoring of health impacts, surveys on children and adult SSBs consumption, obesity, overweight and diabetes prevalence should be regularly collected. Given the long-term effect of the tax policy, it is likely that health impacts will not be seen immediately.

2.8 Other considerations

- **Communication of health benefits of taxes to the general public:** Communicating the positive health consequences of a SSB tax, and addressing any potential negative information of the tax is important both to keep a positive public opinion and for the intended impact of reduced SSB consumption.

- **Possibilities to earmark tax revenue:** earmarking for specific programs to prevent obesity will help garner public support for the tax. Earmarking specifically for nutrition and physical activity-related programmes may complement the intended health impact of the tax. Examples of potential programmes and policies that could be supported by the tax revenue (import tariff revenue and potential excise tax revenue) in Sri Lanka include: Subsidizing fruit and vegetable snacks in schools; Promoting the implementation of school gardens as a learning tool and to improve access to fruits and vegetables; implementing an integrated health communication campaign to promote healthy diets.

- **Supportive dietary information:** A regular dietary assessment which would include data that could assess in a quantifiable manner, the degree of contribution of free sugars (and SSB) to the diet would be useful in assessing impact of the taxation.

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Annex A:

The Sri Lanka Household Income and Expenditure Survey

Table 6 shows descriptive variables from the survey, by quintiles of total monthly expenditure. Households in the higher quintiles have a larger number of members and are less likely to be headed by women. Their household heads have more formal education, are less likely to have under-18 members and have a marginally higher access to potable water.

Table 6 : Descriptive average variable. HIES 2012-13

Variable	Quintile 1		Quintil 2		Quintil 3	
	Average	Std. Deviation	Average	Std. Deviation	Average	Std. Deviation
Average monthly total expenditure	LKR 13,246.24	3646.386	LKR 22,435.39	2263.828	LKR 30,885.68	2746.364
Percentage of Household head women	34.23%	0.474	23.10%	0.421	20.97%	0.407
Average household size	2.95	1.452	3.96	1.411	4.31	1.500
Average age of household head	54.49	15.216	49.72	13.845	49.90	13.703
Percentage of household head living with partner	62.92%	0.483	79.95%	0.400	82.34%	0.381
Percentage of household head with primary education incomplete	52.54%	0.499	41.65%	0.493	33.56%	0.472
Percentage of household head with secondary education incomplete	34.80%	0.476	47.96%	0.500	51.53%	0.500
Percentage of household head with university education incomplete	12.66%	0.333	10.39%	0.305	14.92%	0.356
Percentage of households from the West district	11.53%	0.319	15.65%	0.363	23.00%	0.421
Percentage of households from the Central district	12.37%	0.329	13.92%	0.346	13.19%	0.338
Percentage of households from the South district	14.63%	0.353	13.06%	0.337	13.87%	0.346
Percentage of households from the North district	6.30%	0.243	6.07%	0.239	4.80%	0.214
Percentage of households from the East district	9.35%	0.291	9.98%	0.300	8.85%	0.284
Percentage of households from the North-west district	12.94%	0.336	14.10%	0.348	13.35%	0.340
Percentage of households from the North-Central district	7.77%	0.268	7.64%	0.266	6.88%	0.253
Percentage of households from the Uva district	11.84%	0.323	7.12%	0.257	5.77%	0.233
Percentage of households from the Sabaragamuwa district	13.28%	0.339	12.46%	0.330	10.29%	0.304
Percentage of households with at least a minor (under 18)	42.49%	0.494	66.72%	0.471	70.56%	0.456
Percentage of households with a Sinhala household head	76.15%	0.426	73.96%	0.439	74.61%	0.435
Percentage of households with a Sri Lanka household head	12.49%	0.331	12.62%	0.332	10.12%	0.302
Percentage of households with a Indian Tamil household head	4.92%	0.216	5.06%	0.219	4.62%	0.210
Percentage of households with a Sri Lanka Moore household head	6.23%	0.242	8.12%	0.273	10.32%	0.304
Percentage of households with household head from other ethnic group	0.20%	0.045	0.23%	0.048	0.33%	0.058
Percentage of households with access to drinking water	89.61%	0.305	91.54%	0.278	93.19%	0.252

Variable	Quintil 4		Quintil 5		Total	
	Average	Std. Deviation	Average	Std. Deviation	Average	Std. Deviation
Average monthly total expenditure	LKR 43,612.81	4897.228	LKR 97,050.81	74027.260	LKR 41,443.36	44481.710
Percentage of Household head women	20.45%	0.403	18.52%	0.388	23.46%	0.424
Average household size	4.55	1.587	4.71	1.673	4.10	1.650
Average age of household head	50.70	13.171	51.50	13.075	51.26	13.932
Percentage of household head living with partner	84.34%	0.363	85.27%	0.354	78.97%	0.408
Percentage of household head with primary education incomplete	25.57%	0.436	15.21%	0.359	33.70%	0.473
Percentage of household head with secondary education incomplete	52.36%	0.499	45.78%	0.498	46.49%	0.499
Percentage of household head with university education incomplete	22.08%	0.415	39.01%	0.488	19.81%	0.399
Percentage of households from the West district	37.62%	0.484	51.46%	0.500	27.85%	0.448
Percentage of households from the Central district	12.04%	0.325	10.27%	0.304	12.36%	0.329
Percentage of households from the South district	11.15%	0.315	9.44%	0.292	12.43%	0.330
Percentage of households from the North district	4.36%	0.204	3.32%	0.179	4.97%	0.217
Percentage of households from the East district	5.89%	0.235	3.17%	0.175	7.45%	0.263
Percentage of households from the North-west district	11.01%	0.313	10.28%	0.304	12.34%	0.329
Percentage of households from the North-Central district	5.70%	0.232	4.10%	0.198	6.42%	0.245
Percentage of households from the Uva district	3.86%	0.193	3.19%	0.176	6.35%	0.244
Percentage of households from the Sabaragamuwa district	8.37%	0.277	4.77%	0.213	9.83%	0.298
Percentage of households with at least a minor (under 18)	72.07%	0.449	71.86%	0.450	64.74%	0.478
Percentage of households with a Sinhala household head	75.38%	0.431	82.49%	0.380	76.52%	0.424
Percentage of households with a Sri Lanka household head	10.07%	0.301	7.97%	0.271	10.66%	0.309
Percentage of households with a Indian Tamil household head	3.97%	0.195	1.59%	0.125	4.03%	0.197
Percentage of households with a Sri Lanka Moore household head	10.00%	0.300	7.30%	0.260	8.39%	0.277
Percentage of households with household head from other ethnic group	0.58%	0.076	0.66%	0.081	0.40%	0.063
Percentage of households with access to drinking water	94.17%	0.234	95.49%	0.208	92.80%	0.258

Table 7 : Odd-ratios from logistic regression on SSB consumption

VARIABLES	Dependent variable **Positive expenditure in SSB**
Quintile 2 (ref. Quintile 1)	1.770***
	(0.0161)
Quintile 3 (ref. Quintile 1)	2.833***
	(0.0244)
Quintile 4 (ref. Quintile 1)	4.514***
	(0.0378)
Quintile 5 (ref. Quintile 1)	8.313***
	(0.0691)
Household head sex (ref. female)	1.021***
	(0.00462)
Household head secondary incomplete (ref. Primary incomplete)	1.181***
	(0.00539)
Household head university incomplete (ref. Primary incomplete)	1.136***
	(0.00619)
Household head: Sinhala (ref. Indian Tamil)	1.316***
	(0.0199)
Household head: Sri Lanka (ref. Indian Tamil)	2.977***
	(0.0484)
Household head: Sri Lanka Moore (ref. Indian Tamil)	3.097***
	(0.0486)
Household head: Other (ref. Indian Tamil)	0.650***
	(0.0268)
Drinking water availability	0.731***
	(0.00503)
Household has minors	1.225***
	(0.00520)
District: West (ref. Sabaragamuwa)	1.193***
	(0.0102)
District: Central (ref. Sabaragamuwa)	1.058***
	(0.0106)
District: South (ref. Sabaragamuwa)	1.077***
	(0.0109)
District: North (ref. Sabaragamuwa)	2.131***
	(0.0248)
District: East (ref. Sabaragamuwa)	1.662***
	(0.0171)
District: North-West (ref. Sabaragamuwa)	2.740***
	(0.0243)
District: North-Central (ref. Sabaragamuwa)	1.514***
	(0.0166)
District: Uva (ref. Sabaragamuwa)	0.639***
	(0.00946)
Constant	0.00914***
	(0.000174)
Observations	5,116,989

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Annex B:

Alternative scenarios for SSB taxation

The first alternative scenario for SSB taxation is the introduction of an ad-valorem excise that increases SSB prices (each of them) by 20%. Table 8 shows the results for such a case, for the different own-price elasticities. For carbonates the 20% increase in price, means a decrease in SSB consumption that is between 15 million and 21 million litres, and a tax revenue that is between 3.3 billion and 3.5 billion Rupees, depending on the demand elasticity value. For concentrates the decrease in consumption would be between 6.7 million and 9.2 million litres, with a tax revenue between 2.5 billion and 2.7 billion Rupees. For RTD coffee and tea the decrease in consumption would be between 0.5 and 0.6 million litres, with an increase in tax collection between 370 million and 400 million Rupees. Finally, consumption of Sports and Energy drinks would decrease between 0.1 and 0.2 million litres, while tax collection would increase between 300 million and 322 million Rupees. Overall, SSB consumption would decrease between 22 million and 31 million litres, and tax revenue would increase between 6.45 billion and 6.9 billion Rupees. In the latter, the extra revenue would be about 0.5% of the total tax revenue.

Table 8 : Ad-valorem excise tax on SSB

Price elasticity of demand	Current consumption (million litres)	Current average price	% Increase in price	New average price	% Change in consumption	Change in consumption (million litres)	Tax revenues (in million Rupees)
Increase by 20% in prices due to an ad-valorem tax							
Carbonates							
-0.8	94.0	186.0	20%	223.1	-16%	15.0	3524.0
-1.0	94.0	186.0	20%	223.1	-20%	18.8	3356.2
-1.1	94.0	186.0	20%	223.1	-22%	20.7	3272.3
Concentrates (liquid or solid) (*)							
-0.8	42.0	318.5	20%	382.2	-16%	6.7	2696.6
-1.0	42.0	318.5	20%	382.2	-20%	8.4	2568.2
-1.1	42.0	318.5	20%	382.2	-22%	9.2	2504.0
RTD Coffee and Tea							
-0.8	2.9	681.4	20%	817.7	-16%	0.5	398.4
-1.0	2.9	681.4	20%	817.7	-20%	0.6	379.4
-1.1	2.9	681.4	20%	817.7	-22%	0.6	369.9
Sports and Energy drinks							
-0.8	0.9	1737.1	20%	2084.6	-16%	0.1	322.7
-1.0	0.9	1737.1	20%	2084.6	-20%	0.2	307.3
-1.1	0.9	1737.1	20%	2084.6	-22%	0.2	299.6

(*) Called "Juices" in Euromonitor's report

SOURCE: OWN ESTIMATES

The second alternative scenario is the introduction of a specific excise tax that leads to a 20% increase in the average SSB price. Table 9 display these results. The amount of the specific tax is Rs 47.5 per litre, which is equal to the 20% of the average SSB price for 2017 (according to Table 2). For Carbonates, this excise would increase average prices by 26%; its consumption would decrease between 19 million and 26 million litres, and the tax revenue would be between 3.2 billion and 3.5 billion Rupees, depending on the demand elasticity

value. In the case of Concentrates, the average price would increase by 15%, consumption would decrease between 5 million and 7 million litres, with an extra tax revenue between

1.66 billion and 1.75 billion Rupees. For RTD coffee and tea the increase in average price would be 7%, while the decrease in consumption would be about 0.2 million litres, and with an increase in tax collection between 127 million and 130 million Rupees. Finally, average price of Sports and Energy drinks would increase about 3%, while consumption would remain almost unaltered, while tax collection would increase between 42.5 million and 42.8 million Rupees. Overall, SSB consumption would decrease between 24 million and 34 million litres, and tax revenue would increase between 5 billion and 5.5 billion Rupees.

Table 9 : Specific excise tax on SSB

Specific tax of about Rs 47.5 per litre (20% of average Euromonitor price for 2016)							
Price elasticity of demand	Current consumption (million litres)	Current average price	% Increase in price	New average price	% Change in consumption	Change in consumption (million litres)	Tax revenues (in million Rupees)
Carbonates							
-0.8	94.0	186.0	26%	233.5	-20%	19.2	3553.0
-1.0	94.0	186.0	26%	233.5	-26%	24.0	3324.8
-1.1	94.0	186.0	26%	233.5	-28%	26.4	3210.8
Concentrates (liquid or solid) (*)							
-0.8	42.0	318.5	15%	366.0	-12%	5.0	1757.2
-1.0	42.0	318.5	15%	366.0	-15%	6.3	1697.7
-1.1	42.0	318.5	15%	366.0	-16%	6.9	1667.9
RTD Coffee and Tea							
-0.8	2.9	681.4	7%	728.9	-6%	0.2	130.1
-1.0	2.9	681.4	7%	728.9	-7%	0.2	128.2
-1.1	2.9	681.4	7%	728.9	-8%	0.2	127.2
Sports and Energy drinks							
-0.8	0.9	1737.1	3%	1784.7	-2%	0.0	42.8
-1.0	0.9	1737.1	3%	1784.7	-3%	0.0	42.6
-1.1	0.9	1737.1	3%	1784.7	-3%	0.0	42.5

(*) Called "Juices" in Euromonitor's report