



# Implicit Budgetary Subsidies as Unrecovered Costs and Environment: An Empirical Study of Haryana

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## Abstract

Present paper is an attempt to relate implicit budgetary subsidies with environment with special emphasis on the energy sector for the state of Haryana for selected years during the post-reform period. The objective of the paper is to see the trend and composition of these subsidies during the study period in the context of the bearings they have on the environment. Implicit budgetary subsidies were calculated using Srivastava and Rao (2003) methodology and budgetary classification of services in terms of environmental bearing was done using Pandey and Srivastava (2001) criteria. An increasing trend was found in the subsidies over the study period in general. Subsidies in favour of environment were not only larger but they grew also at a faster pace than those associated with adverse bearings on the environment. The study also noted that these subsidies increased in renewable energy in recent years of the period than the earlier years which shows the government's effort towards sustainable development.

Keywords: Subsidies, Energy, Environment, Implicit, Budgetary, Renewable.

## Introduction

India is the most populous country and holds fifth rank in the world's nominal GDP as on today. It is also world's third largest economy in terms of purchasing power parity (PPP). With this pace of growth in population and GDP, comes the increasing demand for energy. Majority of this demand is met through are non-renewable sources of energy. Government of India has to choose its levers that shape its energy mix which includes price and income subsidies, in the form of fiscal incentives, regulated energy prices and other forms of government support. Currently, kerosene, natural gas and electricity are provided in subsidised rates in India which are mainly sourced from non-renewable sources of energy.

Energy subsidies are important because energy is at the heart of nearly every economic activity. These economic activities are not necessarily environment-friendly and more often than not, lead to various environmental challenges, including pollution, deforestation and climate change. To address these challenges, India needs to implement environmentally sustainable policies. Here arises the need for subsidies in renewable energy which can encourage the production as well as consumption of renewable energy, promote energy efficiency and sustainable agriculture. The government also needs to restructure its energy sector by shifting

its policy support away from fossil fuels towards clean energy, if it wants to reach the target of 500 GW of non-fossil power capacity by 2030 and net-zero emissions by 2070.

Energy subsidies are dominated in, kerosene, natural gas and electricity at the central level. These subsidies are explicit in nature. But at the state level, majority of the subsidies are hidden in the provision of various social and economic services. These subsidies are called implicit budgetary subsidies. The objective of this chapter is to provide insights into the importance of implicit budgetary energy subsidies towards environment. Present paper is divided into four sections. Section one sets the background of energy subsidies in general. It covers the definitions, types, recent trends and estimates of energy subsidies in India and importance of subsidy reforms. Section two focuses on the detailed methodology of implicit budgetary subsidies in energy for the state of Haryana for some selected years of post-reform period. Section three discusses the estimates of these subsidies from the view point of environmental impact. It does so by dividing the social and economic services of functional classification of budget into Group I and Group II, followed by the results. It also presents these estimates as percentage of the revenue expenditure and GSDP of Haryana over the selected years of the study. The last section concludes the paper's findings coupled with the limitations and future scope of the study.

## **1. Theoretical Background**

### **1.1 What is a subsidy?**

There are a number of definitions of subsidies available in the literature. One which has international consensus has been adopted by the World Trade organization (WTO), which recognises four kinds of subsidies:

- (a) direct fund transfers (grants, loans and equity infusion) or liabilities (loan guarantees)
- (b) foregone government revenue or the revenue which is not collected by the government (fiscal incentives such as tax credits)
- (c) Provision of goods or services other than general infrastructure
- (d) Income or price support.

As for subsidies on energy in particular, the International Energy Agency (IEA) has a widely accepted definition (IEA, 1999):

“Any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers.”

### **1.2 Why reforms in energy subsidies are important?**

There are primarily three reasons for the policy makers to focus on reducing and eventually eliminating non-renewable energy subsidies. The first is that it has macroeconomic connotations. Subsidies can be a drag on the fiscal space, especially in financially stressed settings. Second, these subsidies discourage investments in energy efficiency, renewable energy and clean energy infrastructure. Hence, shifting fiscal incentives away

from non-renewable energy to a greener and less-carbon forms of energy can encourage sustainable economic development. Third, “wasteful” consumption of fossil-fuels can be reduced. The policymakers mainly focus on the third reason. The often-common related assumption is that fossil fuel subsidies are high in emerging and developing economies, as opposed to developed economies.

It has been observed that price elasticity of non-renewable energy is remarkably low, both in the short as well as long run. It is near-zero in most developing economies in the short-run. It slightly progresses in the longer-term but still remains insignificantly inelastic because of fewer substitutes to fossil-fuels. Fossil-fuel prices would therefore have to be raised dramatically to have any significant effect on quantities.

These subsidies impose a massive fiscal burden on the exchequer, which is ultimately financed by a mix of higher public debt, larger tax liabilities and crowding out of potentially productive investment in physical and social infrastructure or other developmental expenditures. Thus, the impact of these subsidies is fiscal imbalance and slower economic growth. To improve the fiscal situation, reforms and restructuring of subsidies is required. Reforming subsidies would have social, economic and environmental impact. It would remove the market distortions, incentivize clean energy solutions, promote energy efficiency and also reduce the current pollution levels.

### **1.3 How much are energy subsidies?**

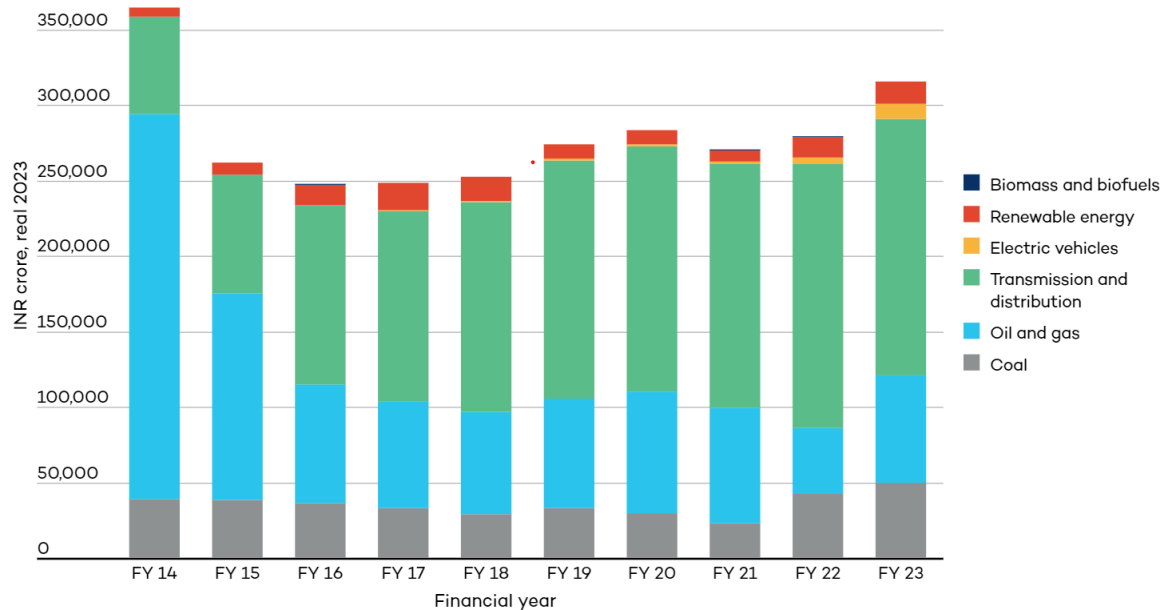
Energy subsidies are dominated in non-renewable sources, both at the union and the state level. In fiscal 2010–2011, the Government of India spent 43,904 crore rupees in subsidizing diesel, kerosene and LPG. In addition, oil marketing companies (OMCs) incurred 37,190 crore rupees worth of under-recoveries. In the same year, total expenditure on fertilizer and food subsidies by the Union grew by 26.7 per cent. These subsidies resulted in huge fiscal imbalance during the same year. This called for much tougher reforms in the area of subsidies to meet the government’s fiscal policy objectives. As a result, full deregulation of diesel prices and periodic increases of domestic Liquefied Petroleum Gas (LPG) and Public Distribution System (PDS) kerosene prices was recommended by Kirit Parikh led committee in 2010.

In 2012–13, the Union government set an intended target of reducing total subsidies to 2 per cent of GDP and further to under 1.75 per cent of GDP over the next three fiscal years, although food subsidies continued to be fully provided for. Policy measures, such as better targeting of subsidies and improved transparency were set out to reduce the total subsidy bill.

As per the latest report by the International Institute for Sustainable Development (IISD), titled ‘*Mapping India’s Energy Policy: A Decade in Action*’, India’s energy subsidies amounted to Rs 3.2 lakh crore in the fiscal year 2023, reflecting a nine-year high for the country. Subsidies in renewable energy constituted only 10 percent of this amount while fossil fuel subsidies made up around 40% of the total energy subsidies. The estimates also stated that fossil fuel subsidies stood at five times the clean energy subsidies in fiscal 2022–23. It was also reported that both clean energy and fossil fuel subsidies grew at the rate of around 40%, with renewable energy subsidies and electric vehicles growing slightly faster than the fossil fuel subsidies. Below

are the latest estimates on energy subsidies in India as presented in the report for the past decade i.e. FY 2014–FY 2023.

### Estimates on Energy Subsidies in India from FY 2014 to FY 2023



Source: International Institute for Sustainable Development (IISD), GSI 2023

Over the past decade, it can be observed that energy subsidies in oil and gas showed a consistent decline. On the other hand, subsidies in transmission and distribution increased over the years and holds the largest share in energy subsidies in recent years. Energy subsidies in coal stood almost stagnant throughout the decade. The least amount of energy subsidies was given for electric vehicles. Renewable energy was the second last recipient of energy subsidies.

The report also recommended a shift of support from fossil fuel to clean energy to achieve India's global commitments such as achieving 50% cumulative electric power installed capacity from non-fossil sources by 2030, gaining energy independence by 2047 and net-zero emissions by 2070. At present, out of India's installed generational capacity (fuel-wise), 56.8% energy comes from fossil fuel and 41.4% comes from non-fossil fuel i.e. hydro, solar, wind and other renewable sources.

#### 1.4 Why estimation of subsidies is important?

The first and foremost step of any subsidy reform is the identification of the concerned beneficiaries which requires proper definition of subsidy. A prominent factor in estimating the volume of subsidies is which definition of "subsidies" is used.

There are three types of subsidies: producer subsidy, consumer subsidy and budgetary subsidy. Producer subsidy is expressed as price differential between procurement price and cost of production. These subsidies provide only the producers' perspective and do not include the administrative and handling costs. Hence, they give incomplete information on subsidies. Consumer subsidies are direct money transfers to individuals which provide consumer's perspective only. Although these two subsidies are more popular than budgetary subsidies, neither of the two gives a comprehensive view on subsidies. Here comes the need to introduce the

third category of subsidies; budgetary subsidies as unrecovered costs. This approach believes that all the cost which is incurred in public provision of non-public goods and not recovered should be considered subsidy. While recognising such costs, certain expenditures emerge, from which no recoveries are expected. These items are excluded in the cost of provision of non-public goods.

India provided the fourth largest fuel subsidies among countries in absolute terms in 2022 preceded by China, the United States and Russia, according to a working paper by the International Monetary Fund. Out of India's \$346 billion (or 10.6 per cent of GDP) fuel subsidies, the IMF said, \$32 billion is explicit subsidies while \$314 billion is implicit subsidies. The present paper looks at budgetary subsidies for energy consumption as unrecovered cost which is often hidden in budgets as implicit budgetary subsidies.

## 2. Methodology of Calculating Implicit Budgetary Subsidies

**Definition:** In present work, implicit budgetary subsidies are defined as unrecovered cost in the public provision of non-public goods by the Haryana government. Non-public goods are defined as those where it is possible to recover, at least in principle, the cost of providing services according to the extent of their consumption. In the functional classification of the budget, the goods under reference are those which are categorised as social services and economic services. But not all social and economic services are in the nature of non-public goods. Hence implicit subsidies are estimated for only those social and economic services which have the properties of non-public goods. All general services are kept out of the purview of implicit budgetary subsidies for the same reason.

### Formula:

Implicit budgetary subsidy ( $S$ ) in a particular year for a service is defined as the difference between total cost of provision of the concerned service ( $TC$ ) and total recovery made from the users ( $TR$ ) using Srivastava and Rao (2003) methodology.

Symbolically, it can be expressed as,

$$S = TC - TR$$

Total cost of public provision of the service is defined as

$$TC = RE + (i + d) K + iZ \quad \text{-----}(2.1)$$

Where,

RE= Revenue expenditure on the service net of adjustments during the concerned year.

$i$ = Effective rate of interest (also known as imputed rate of interest) for the concerned year.

$d$ = Adjusted depreciation rate (ADR) for the concerned year.

$K$ = Physical capital stock of the service at the beginning of the concerned year.

$Z$ = Sum of financial investment and loan advanced by the state government for the service at the beginning of the concerned year.

**2.1 Total cost** of public provision of the service is expressed as the sum of three costs which are:

**2.1.1. Revenue Expenditure or Current Cost (RE):** It was the current cost of provision of the service. It referred to the revenue expenditure on the service during the concerned year, net of certain adjustments.

**2.1.2. Annualised cost of physical capital stock of the state government  $\{(i + d) K\}$ :** It was the sum of two annualised costs which were:

(a) **Annualised cost of borrowing to finance the physical capital stock  $(iK)$ :** It is actually the imputed cost of acquiring physical capital through borrowings. It was obtained by multiplying the physical capital stock with effective rate of interest, where effective rate of interest referred to the ratio of interest payments during the year to outstanding debt at the beginning of the year.

(b) **Annualised adjusted depreciation cost of physical capital stock  $(dK)$ :** It was computed by multiplying adjusted depreciation rate ( $d$ ) with the physical capital stock ( $K$ ) where adjusted depreciation rate referred to nominal depreciation adjusted for certain factors. Adjusted depreciation rate was calculated using long term average rate of inflation and growth rate of nominal investment for a concerned year. The methodology of adjusted depreciation rate (ADR) is explained later in the section.

**2.1.2.(a) Effective/ imputed interest rate of the state government for the concerned year ( $i$ ):** The effective/imputed interest rate referred to the cost at which the state government was borrowing. It was obtained by dividing the interest payments during the year by outstanding debt of the government at the beginning of the concerned year. All three components of public debt and other liabilities were considered in defining outstanding debt which were

- ✓ Internal Debt of the state government which comprised of market loans, ways and means advances from RBI, bonds, loans from financial institutions, small securities issued to National Small Savings Fund and other loans
- ✓ loans and advances from the centre
- ✓ other liabilities which consisted of state provident fund, insurance and pension funds, reserve funds and deposits. The data required for imputed interest rate was compiled from finance accounts of Haryana.

**2.1.2. (b) Adjusted Depreciation Rate (ADR) for the concerned year ( $d$ ):**

It was calculated using the following formula

$$d = \left(\frac{1}{T}\right) \left\{ \frac{w^{T-1}}{x^{T-1}} \right\} (1 + y) \quad \text{if } x, w > 1$$

where,

T = useful life of the physical capital asset, assumed to be fifty years

$$w = \left( \frac{1+y}{1+z} \right)$$

$$x = \left( \frac{1}{1+z} \right)$$

y = long term average rate of inflation

z = rate of nominal investment

The formula was derived using the following methodology:

If T was the useful life of a physical capital asset then,

$$\left( \frac{1}{T} \right) = \text{nominal depreciation rate per annum for the asset to be written off}$$

The present year or year under consideration was taken to be (T+1)<sup>th</sup> year. Hence, the past years under consideration were from 1 to T.

**Calculation of ADR** requires following parameters to be known a prior which were:

- ✓ **Long term average rate of inflation (y):** It referred to implicit price deflator of gross domestic capital formation (GDCF) in the public sector of India. An implicit price deflator was calculated as the ratio of nominal value of a series of any economic variable to its corresponding real value (base year value) multiplied by hundred. The ratio provided a price index which was used as a measure of inflation. In the present case, the selected economic variable was capital goods which was represented by gross domestic capital formation (GDCF) in the public sector of India. Capital goods were taken because the concept of depreciation pertained to capital goods only and just the public sector was included because the present study deals with subsidies arising from the public provision of social and economic services. Data on current and constant prices (base year 2011-12) of GCF in public sector at national level was sourced from National Accounts Statistics 2019, published by MOSPI (Ministry of Statistics and Programme implementation), Government of India. This data was utilised to compute yearly estimate of price deflator of GCF in the public sector by simply dividing the GCF at current prices with the GCF at constant prices. Dividing change in deflator with deflator of preceding year multiplied by hundred gave annual rate of inflation for that year. Similarly annual rates of inflation for all years were calculated. To compute long-term rate of inflation of the reference/representative year, simple average was taken of all annual rates of inflation from year 1960 to the concerned year. Simple average of these annual rates of inflation was taken from the starting year to the year of concern to reach the long-term average rate of inflation. This rate of inflation pertained to all India level as the data on constant prices of GCF by industry of use in public sector was not available at state-level. Since inflation rate did not differ significantly for states and the union, rate of inflation for the overall economy was used as a proxy for the state.

- ✓ **Growth rate of nominal investment (z):** It was given by compound annual growth rate (CAGR) of gross fixed capital formation (GFCF) at current prices in the public sector of Haryana from 1978-79 to 2017-18. Capital formation was described as country's current output and imports which was neither consumed nor exported during the accounting period but was set aside as an addition to its existing stock of capital goods. Capital formation comprised of Gross Fixed Capital Formation (GFCF) and change in stock of raw materials, semi-finished and finished goods.
- ✓  **$K_{T+1}$** = Physical capital stock of the state government under the heads of social and economic services till the beginning of the concerned year. Physical capital stock, according to the present study referred to the cumulative outlay on stock of physical assets only, owned by the state government of Haryana.

Besides these parameters, following assumptions were also made, while arriving at the Adjusted Depreciation Rate (ADR) which were:

- ✓ Average useful life of a capital asset was taken as fifty years.
- ✓ Adjustment was made in the value of accumulated physical capital stock at the beginning of the concerned year. Physical capital stock of the last three years was considered fresh physical capital and hence it was assumed that it did not start yielding returns right from the commencement. Hence while calculating capital stock; one third of last three years' physical capital expenditure was excluded as fresh physical capital. Only two-third of physical capital expenditure during the last three years was taken into consideration.

The adjusted depreciation rate (ADR) had a behaviour corresponding to the behaviour of inflation and investment growth rate. Higher the inflation rate, higher was the depreciation rate, for any given rate of growth of investment. Higher the investment growth rate, the lower was the depreciation rate for any given inflation rate.

**2.1.3. Annualised cost of financial investments and loans of the state government ( $iZ$ ):**  $Z$ = sum of equity investments of the government in different PSEs (joint stock companies, co-operative banks and societies etc) and loans advanced by the government till the beginning of the concerned year under the heads of social and economic services. Annualised cost of financial investments and loans of the state government ( $iZ$ ) referred to the combined annualised cost of loans and financial investments made by the state government.

Below table gives parameters used in the calculation of total cost (TC):

**2.1.4. Parameters Used to Calculate Total Cost for the Study Period**

<b>Year</b>	<b>Rate of Investment (z)</b>	<b>Long Term Average Rate of Inflation (y)</b>	<b>Adjusted Depreciation Rate (d)</b>	<b>Imputed Rate of Interest (i)</b>
1992-93	.092	.0896	.088	.1054
1999-00	.0736	.0872	.106	.1411
2006-07	.092	.0809	.0725	.0898
2013-14	.112	.0778	.0562	.0969
2017-18	.115	.0738	.0514	.0853

**Notes:**

1. Rate of Investment referred to compound annual growth rate (CAGR) of gross fixed capital formation in public sector of Haryana at current prices from 1978-79 to the respective year.
2. Depreciation rate is adjusted depreciation rate (ADR) which was calculated using long term rate of inflation and rate of investment.
3. Long-term average rate of inflation was given by implicit price deflator of gross domestic capital formation (GDCF) of India, calculated for the period 1960-61 to 2017-18.
4. Imputed rate of interest referred to the cost of borrowing during that year. It was defined as the ratio of interest payments in the current year to the outstanding debt at the beginning of the concerned year.

**Source:** Author’s Calculations

(Basic data): Statistical Abstract of Haryana, various years, Department of Economic and Statistical Analysis (DESA) for rate of investment.

National Accounts Statistics 2019, Ministry of Statistics and Programme implementation, Government of India for rate of inflation. Finance Accounts for various years for imputed rate of interest.

**2.2. TR= NTR -----(2.2.1)**

**2.2.1 Total receipts** comprise of only non-tax revenue receipts arising from the public provision of the service because implicit budgetary subsidies were calculated for social and economic services and the revenue proceeds from these services fell under non-tax revenue. One could say that budgetary services were the direct sources of non-tax revenue receipts. On the contrary, tax receipts didn’t originate from budgetary services. They might be used to finance these subsidies but one could not be sure about the proportion of tax revenues and borrowings used to finance the subsidies.

where,

**NTR = I + DD+ ONTR -----(2.2.2)**

NTR= Non-tax revenue receipts arising from the service which consist of

I= Interest received on the loans advanced by the state government for the provision of the service

DD= Dividends received on financial investments made by the state government for the provision of the service

ONTR= recoveries directly coming from the provision of social and economic services in the form of user charges, fees, fines etc.

**2.2.2. Non-tax revenue receipts:** non- tax revenue receipts consisted of interest receipts, dividends and profits and other non-tax revenue. Interest receipts were the interests received on loans advanced by the state government to various enterprises for the provision of social and economic services. Dividends were the returns on the equity investments made by the state government in different concerns; namely statutory corporations, government companies, joint stock companies and co-operative banks and societies. Other non-tax revenues were the recoveries directly coming from the provision of social and economic services. Capital receipts were also not taken into account because they were included already in capital outlay which meant that capital outlay was the net expenditure after deducting recoveries and receipts on capital account on physical assets and financial investments made by the state government. It also included retirement of financial capital (disinvestment) but not dividends. Dividends were given in a separate statement.

**2.2.3** Two kinds of receipts originated from financial investments of the state government in various concerns. These were revenue receipts which came every year in the form of dividends and capital receipts which came once in a while in the form of retirement of capital or disinvestment. Revenue receipts of financial investments were included separately and explicitly in the formula of total receipts under the name of dividends whereas capital receipts of financial investments were already included in the capital outlay (net capital expenditure after deducting capital recoveries). There were many entries on capital outlay which were negative because of recoveries exceeding the capital expenditure under that head. This further confirmed the presence of capital receipts in the capital outlay. Some reasons behind negative values of capital outlay were:

1. Recoveries exceeding the expenditure
2. Retirement of capital or disinvestment
3. Error or omission
4. Adjustment
5. Transfer of stocks to other works
6. Correction of accounts
7. Material was greater than procurement (under transmission and distribution of thermal power generation).

Besides these variables, census 1991, 2001 and 2011 and projections for population figures were used for population figures of Haryana and Handbook of Statistics on Indian States, various years was referred to for data on GSDP of Haryana.

### **3. Budgetary Classification of Services in Terms of Environmental Bearing**

**3.1.** The budgetary heads that have a bearing on the environment (positive as well as negative) in the social and economic services are identified. Hence, the services are categorised into Group I and Group II. Those services (social and economic) that have a direct positive environmental impact are put in Group I. Other services, that have an adverse or mixed impact on the environment are included in Group II. It is noteworthy that it is the subsidy which is perverse not the service which has been categorised. It is also to be noted that the primary objective of most of the services in Group II is not related directly to the environment and the

adverse or mixed environmental impacts are incidental or indirect in nature. The classification criteria is similar to that of Pandey and Srivastava (2001). The categorisation is presented below.

### Group 1

(1) Water Supply and Sanitation (2) Soil and Water Conservation (3) Fisheries (4) Forestry and Wildlife (5) Agricultural Research and Education (6) Special Areas Development Programme (7) Flood Control Projects (8) Non-Conventional Sources of Energy (9) Ecology and Environment

### Group 2

(1) Major and Medium Irrigation (2) Minor Irrigation (3) Command Area Development Programme (4) Other Industries (5) Cement and Non-metallic Industries, Non-ferrous Mining and Metallurgical Industries

## 3.2. Results: Implicit Budgetary Subsidies in Crore Rs for the State of Haryana in Various Years

	1992-93	1999-00	2006-07	2013-14	2017-18
<b>Group 1</b>	<b>534.93</b>	<b>882.53</b>	<b>1389.27</b>	<b>2790.62</b>	<b>3816.58</b>
(1) Water Supply and Sanitation	193.35	517.63	771.58	1673.24	2299.68
(2) Soil and Water Conservation	26.96	45.56	30.52	39.09	59.58
(3) Fisheries	6.65	11.93	13.09	19.00	31.87
(4) Forestry and Wildlife	74.52	62.97	178.08	184.48	210.86
(5) Agricultural Research and Education	74.02	78.18	152.33	231.37	312.05
(6) Special Areas Development Programme	0.00	4.00	17.39	11.32	79.97
(7) Flood Control Projects	129.59	112.62	78.95	129.72	207.43
(8) Non-Conventional Sources of Energy	28.73	48.41	145.61	498.01	608.9
(9) Ecology and Environment	1.11	1.23	1.72	4.40	5.95
<b>Group 2</b>	<b>1171.70</b>	<b>1492.06</b>	<b>1388.56</b>	<b>2059.45</b>	<b>2101.98</b>
(1) Major and Medium Irrigation	1041.44	1339.34	1363.54	1868.36	2287.75
(2) Minor Irrigation	122.88	207.27	151.71	96.18	84.28
(3) Command Area Development Programme	9.09	28.96	34.85	24.40	46.30

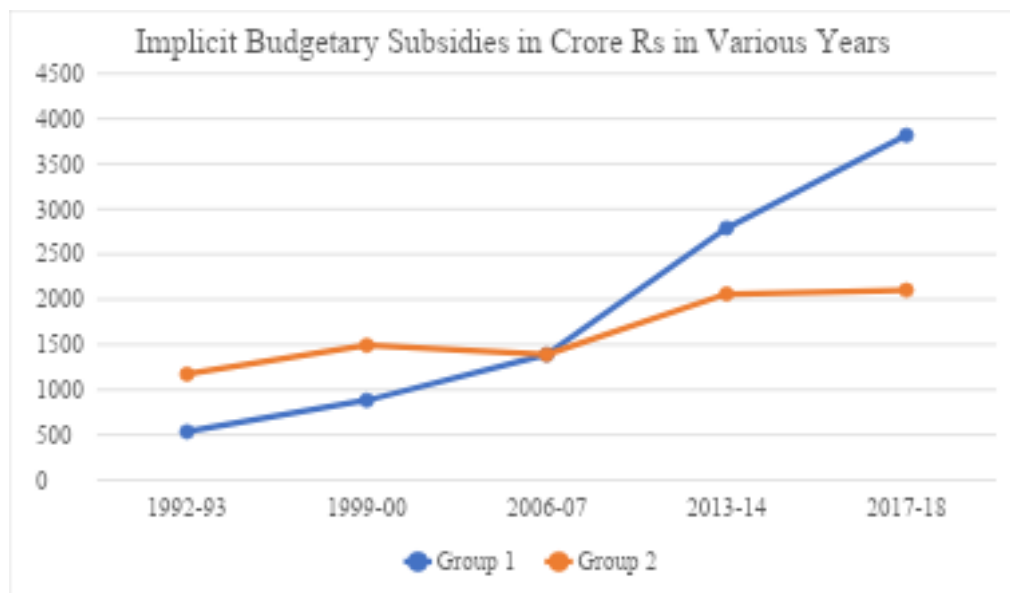
(4) Other Industries	12.99	20.73	21.73	38.25	19.69
(5) Cement and Non-metallic Industries, Non-ferrous Mining and Metallurgical Industries	-14.70	-104.15	-183.31	32.89	-337.37

**Source:** Author's calculation

**Note:** Negative sign refers to surplus in the concerned budgetary head.

The table represents Implicit Budgetary Subsidies in Crore Rs for the State of Haryana in various years (1992-93, 1999-00, 2006-07, 2013-14, and 2017-18) across Group 1 and Group 2 services.

Largest share of environmental subsidies pertains to Water Supply and Sanitation in Group 1 services, followed by Flood Control Projects in 1992-93 and 1999-00, Forestry and Wildlife in 2006-07 and Non-Conventional Sources of Energy in 2013-14 and 2017-18. In Group 2, Major and Medium Irrigation received the largest amount of implicit budgetary subsidies, followed by minor irrigation in all years of study.



Above chart shows that although subsidies in both groups have increased through the years, growth of subsidies in Group 1 is much higher than that in Group 2. Also, Group 2 services were ahead of group 1 services in terms of implicit budgetary subsidies in 1992-93 and 1999-00. In 2006-07, both became almost equal to each other but the trend reversed in subsequent years.

### 3.3. Implicit Budgetary Subsidies as Proportion of Revenue Expenditure/ GSDP of Haryana

(As % of Revenue Expenditure)	1992-93	1999-00	2006-07	2013-14	2017-18
Group 1	7.09	6.30	6.05	7.49	5.97
Group 2	15.53	10.66	6.04	5.53	3.29

(As % of GSD P)	1992- 93	1999- 00	2006- 07	2013- 14	2017- 18
Group 1	0.97	0.85	0.76	0.78	0.67
Group 2	2.13	1.44	0.76	0.58	0.37

**Source:** Author's calculations

These percentages reflect the proportion of subsidies relative to revenue expenditure and the state's GSDP. The trends indicate changes in subsidy allocation for the environment and economic priorities over the years.

Group A services, reflecting direct and positive environmental impact, expenditure accounted for 7.09% of the revenue expenditure in 1992-93. Over the years, this percentage fluctuated, reaching a peak of 7.49% in 2013-14. By 2017-18, it decreased to 5.97%. Group B services, reflecting adverse and mixed effects on the environment were 15.53% of the revenue expenditure in 1992-93. This percentage consistently declined, reaching 3.29% in 2017-18. As % of GSDP, subsidies in Group A started at 0.97% in 1992-93. By 2017-18, this percentage decreased to 0.67%. On the other hand, Group B subsidies were 2.13% of GSDP in 1992-93. Over time, this percentage significantly dropped to 0.37% in 2017-18.

#### 4.1 Conclusion and Policy Suggestions

**4.1.1.** In absolute terms, implicit budgetary subsidies in both groups have increased through the years but the growth of subsidies in group 1 was much higher than that in Group 2. Also, group 2 services were ahead of group 1 services in terms of implicit budgetary subsidies in 1992-93 and 1999-00 but the trend reversed in recent years of 2013-14 and 2017-18 which implies that the government is redistributing its implicit subsidies towards services with positive environmental impact. It is worth mentioning that non-conventional sources of energy (also renewable energy) held a very negligible share in implicit budgetary subsidies of the state in initial years of study but in 2013-14 and 2017-18 it occupied the second largest position in Group 1 services.

**4.1.2.** As % of the revenue expenditure, subsidies in Group 1 services witnessed a drop of over a percentage, whereas Group 2 services saw a dramatic fall of more than 12 percentage during the study period. As % of GSDP, subsidies in Group 1 fell negligibly, whereas the fall was significant for subsidies in Group 2. This again confirms the priorities of the state government towards positive environmental impact and away from adverse and mixed effects on the environment.

**4.1.3.** Cement and Non-metallic Industries, Non-ferrous Mining and Metallurgical Industries belonging to Group 2 generated surpluses instead of subsidies in all years of study except for 2013-14. It implies that this activity which is indirectly leading to negative environmental impact is not given any subsidy. Rather it is creating income for the state government.

## 4.2 Limitations and Future Scope of the Study

**4.2.1.** As noted above, energy subsidies can be a huge fiscal drag for any government. Their fiscal burden on the exchequer can be ascertained in terms of their impact on various deficits like Fiscal Deficit and Revenue Deficit using time series analysis.

**4.2.2.** Energy subsidies need rationalisation and restructuring. Other than subsidies, the concerned authorities should focus on other renewable energy policy instruments which can minimise the fiscal burden on the exchequer and also accelerate renewable energy capacity addition. They can ensure energy security and ensure sustainable development. These policy instruments include promoting clean and green energy entrepreneurship, public-private partnership in such projects, use of auctions with stringent participatory norms, leverage of risk capital by developmental institutions, timely revision of carbon-emission taxes, penalties, environmental cess on polluters and incentivizing green power output. The future scope of the study lies in exploring the effects of these alternatives to energy subsidies.

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