

**Working Paper 353**

**Ecotaxes: A Comparative  
Study of India and China**

**Rajat Verma**

ISBN 978-81-7791-209-8

© 2016, Copyright Reserved

The Institute for Social and Economic Change,  
Bangalore

*Institute for Social and Economic Change (ISEC) is engaged in interdisciplinary research in analytical and applied areas of the social sciences, encompassing diverse aspects of development. ISEC works with central, state and local governments as well as international agencies by undertaking systematic studies of resource potential, identifying factors influencing growth and examining measures for reducing poverty. The thrust areas of research include state and local economic policies, issues relating to sociological and demographic transition, environmental issues and fiscal, administrative and political decentralization and governance. It pursues fruitful contacts with other institutions and scholars devoted to social science research through collaborative research programmes, seminars, etc.*

*The Working Paper Series provides an opportunity for ISEC faculty, visiting fellows and PhD scholars to discuss their ideas and research work before publication and to get feedback from their peer group. Papers selected for publication in the series present empirical analyses and generally deal with wider issues of public policy at a sectoral, regional or national level. These working papers undergo review but typically do not present final research results, and constitute works in progress.*

# ECOTAXES: A COMPARATIVE STUDY OF INDIA AND CHINA<sup>1</sup>

Rajat Verma<sup>2</sup>

## Abstract

*This paper attempts to compare various forms of ecotaxes adopted by India and China in order to reduce their carbon emissions by 2020 and to address other environmental issues. The study contributes to the literature by giving a comprehensive definition of ecotaxes and using it to analyse the status of these taxes in India and China. As per OECD-EEA database's definition, in total there are only twenty-four environmentally related taxes that exist in both the countries. Of these taxes, five out of seven environmentally related taxes in China were revised after the year 2006, and in India all the taxes were levied only after 2002. In addition, as per our definition only seven and five environmentally related taxes in India and China, respectively, can be deemed as ecotaxes. There is a severe paucity of literature on analysing the performance of ecotaxes. Based on the limited literature, it was found that there are several governance related issues in India in managing the funds generated from the ecotaxes. In the case of China, studies reveal that the purpose of consumption tax is defeated as it leads to an increase in total fuel consumption and to a decline in social welfare.*

JEL: H23 Q50 Q53

**Keywords:** Environmental Taxes, Externalities, Polluter-Pay Principle, Tax Base, Progressive Tax

## Introduction

### Statement of Problem

Climate change is now considered to be one of the gravest challenges that threaten the existence of mankind. UNFCCC, an outcome of these threats, is a step towards the integration of the countries of the world. Its major aim is to mitigate global warming, which is the root cause of climate change. Developing countries such as India and China, which earlier maintained a stand of not reducing their emissions, have now agreed to do so voluntarily. China in 2009 committed to reduce its carbon emissions by 40-45% by 2020 compared to 2005 levels (Government of China 2015). India also agreed in 2010 at the Cancun Summit to reduce its carbon emissions by 20-25% by 2020 compared to 2005 levels (Government of India 2015)<sup>3</sup>. In order to control global warming it is imperative that China and India also reduce their emissions as they ranked 1<sup>st</sup> and 3<sup>rd</sup> respectively in the world in 2011 (IEA 2013). For achieving their respective targets, both the countries need to adopt economic measures apart from the conventional measure of Command and Control (CAC). Some of the economic measures which may serve the need are ecotaxes, tradable permits etc. Ecotaxes have been successfully levied in developed countries, especially so in Nordic countries, for more than two decades so as to curtail not only air pollution but also to address the issues in other forms of environmental pollution i.e. water and

---

<sup>1</sup> Part of the chapter is the author's PhD work and he is thankful to Prof K Gayithri (supervisor); Doctoral Committee members: Prof R S Deshpande, Prof S Madheswaran and Dr Barun Deb Pal; Panel Experts Prof Abdul Aziz and Dr Elumalai Kanan. Special thanks to Mr S Subramanian for his continuous support throughout the drafting of this paper.

<sup>2</sup> Doctoral Fellow, Centre for Economic Studies and Policy, Institute for Social and Economic Change, Bangalore, India. E-mail: [rajat.verma1988@gmail.com](mailto:rajat.verma1988@gmail.com); [rajatverma@isec.ac.in](mailto:rajatverma@isec.ac.in)

<sup>3</sup> Both India and China have further committed in 2015 that they will reduce their emissions intensity of their GDP by 33 - 35% and 60 - 65%, respectively, from 2005 levels by 2030.

land. In this paper we make an attempt to compare various forms of ecotaxes adopted by both these countries in order to achieve their ambitious targets and also to reduce the other forms of environmental damages. Making use of environmental taxes for reducing emissions will eventually lead to reducing the risks associated with climate change because carbon emissions are the major source of global warming. Further, this paper would try to fill the gap in the literature as there are not any studies which have compared the status of ecotaxes between India and China, let alone constructing its own definition and using it for the comparison.

### **A Few Definitional Issues Relating to Ecotaxes**

In the literature of eco-taxation, there are several definitions given by various organizations and economists which are conflicting in nature. These differences will be analysed on four major aspects: tax base, earmarking of the revenue from the tax, type of tax i.e. ad-valorem or per-unit tax, and whether the taxes received are required or unrequited payments. Some of these definitions are discussed below:

Steinbach et al. (2009: 4) cite OECD/EEA<sup>4</sup> database's definition:

*'This database defines environmentally related taxes as any compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance. Taxes are unrequited in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments.'*

On the other hand, Eurostat (2001: 9) defines it as: 'A tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment.' As is evident from the above two definitions, there is not any difference in the manner in which the 'tax base' of an ecotax is defined, and also both consider that an ecotax necessarily has to be an unrequited payment to the government. Even though the Eurostat's definition does not explicitly mention this, in their methodology they define taxes as, '*compulsory, unrequited payments, in cash or in kind, made by institutional units to government units*'. Hence, they define taxes in a way that is similar to the OECD/EEA database. In addition, none of the definitions put any restriction on earmarking of the revenue earned from an ecotax.

The only difference is that Eurostat deems only per-unit taxes as an ecotax whereas OECD considers any tax (ad-valorem or per-unit tax) as an ecotax, provided the tax base is of environmental relevance. This is because only for a per-unit tax the tax base could be a physical unit, as mentioned in the Eurostat's definition. Examples of per-unit taxes could be waste tax, petroleum tax etc.

The other perspective of the definition is given by Taylor et al. (n.d.): '*An environmental tax is one which is placed on a good or service to internalize some, or all, of the external costs of the activity undertaken or one which is hypothecated to the use of environmental protection*'

---

<sup>4</sup> OECD/EEA database call these taxes as 'environmentally related taxes' rather than 'environmental taxes' so as to widen the tax base.

We can deduce the following from the definition:

First, the authors consider any tax (or levy) which internalises the external costs or externality of an activity to be an ecotax. Therefore, even a charge/fee is considered as an environmental tax because a charge such as a municipal waste charge will also internalise the negative externality of the waste production to its neighbours. This is because it increases the cost of generating waste by applying a fee on it. On this basis, it completely differs from OECD/Eurostat's definition.

Second, it does not restrict the nature of taxation i.e. a tax could be an ad valorem or a per unit tax. This is because it mentions that a tax, "*which is placed on a good or service*"; and a tax on service is generally an ad valorem tax. So, on this front it is similar to the OECD's definition but different from the Eurostat's definition.

Third, if revenue from any tax is hypothecated or earmarked for environmental purposes, then the authors consider that tax to be an ecotax. In this regard it is completely different from OECD/Eurostat. Therefore, this definition by the authors widens the scope of ecotaxation. For example, even if a tax is on income and some proportion of the revenue earned from that is earmarked for any environmental cause then the authors would consider it to be an ecotax. But, this conflicts with the basic notion of the Pigouvian taxation because in this way the externality associated with the polluter is not internalised and hence may not lead to an efficient solution.

Finally, we also consider the definition given by Chelliah et al. (2007: 27): '*An eco-tax is a price like instrument which assigns a price to the 'unpaid factor' of production. It can translate the 'polluter pays' principle into practice.*' As is evident from this definition, the authors also consider a charge/fee to be an ecotax like Taylor et al. (n.d). In addition, there is no restriction upon the type of tax or upon the earmarking of the revenue.

None of the above mentioned definitions clearly explains the fundamental basis of a tax. For example, the tax base is not defined clearly because there is no mention whether the tax should be imposed directly on the pollutants or indirectly upon the proxies such as those inputs/outputs whose consumption or usage in production produces externality. Also, there is no clarity whether the tax should be progressive or regressive. In addition, they also don't mention the place of the levy of these taxes i.e. whether an ecotax is levied only upon the site of environmental degradation or also upon the use or misuse of environmental resources.

The definition by OECD/EEA and that by Eurostat mentioned above does not define 'tax base' properly. Use of the term 'environmental relevance' by the OECD is very broad and hence does not clearly define the aspects discussed above. Similarly, Eurostat (2001: 9) considers only per-unit taxes as ecotaxes for which there does not seem to be any theoretical justification. This is because even an ad-valorem tax would affect the prices of a polluting product in a similar manner as a per-unit tax. Both would create an equal amount of disincentive for the consumer or producer by increasing the final price of consumption or production respectively.

Due to the above mentioned shortcomings, we would propose the following comprehensive definition of environmental taxes:

*'An ecotax is a tax<sup>5</sup> whose tax base<sup>6</sup> is defined so as to internalise the negative externality generated either from the production/consumption/extraction behaviour in an economy'*

This definition incorporates a broad definition of tax base, mentions clearly the place of levy of the ecotaxes, i.e. production/consumption and extraction processes, and also states that the rate structure of such taxes should be progressive<sup>7</sup>. In the case of environmental taxation, progressive rate structure is imperative because it is in accordance with its fundamental idea i.e. to charge more to a more polluting product so as to dis-incentivize its usage and hence follow the 'polluter-pay approach' appropriately. While focussing on the theoretical aspects of an environmental tax, it also considers its operational feature, unlike the OECD/Eurostat definition, which emphasises only the practical aspects. This is because the above constructed definition defines tax base comprehensively; thus, if a tax is levied upon a polluting factor of production/other inputs/by-products and if the tax is progressive then it shall be called as an environmental tax. Since these features are easily discernible while reviewing the ecotaxes of any country, comparing these taxes across various countries will not be a problem. For comparing ecotaxes between India and China we have used both OECD and our definition so as to expose the problem with the OECD and Eurostat's definition.

One of the classifications of environmental taxes that is widely accepted in the literature classifies it into four basic categories: energy, transport, pollution and resources taxes (Eurostat 2001: 12, cited in Steinbach, et al. 2009: 4). But a better categorisation, as adapted from Milne and Andersen (2012), would be: emission and effluent taxes, product taxes and natural resource taxes<sup>8</sup>. This is because there are some loopholes in the previous categorisation. For instance, a tax on CO<sub>2</sub> is considered under the category of energy taxes because according to the Eurostat, it is difficult to segregate these taxes as they are generally levied along with energy taxes, an example being the high taxes on mineral oils which have high carbon content. But if we classify these taxes according to the latter methodology, then CO<sub>2</sub> taxes would be considered under emission and effluent taxes when emissions are directly charged, and under product taxes when minerals with carbon content are taxed, thus avoiding scope for any ambiguity.

---

<sup>5</sup> A tax is defined as, "Any compulsory, unrequited payment to general government - central, state or district level - depending upon the fiscal structure of the economy" (OECD 2006)

<sup>6</sup> A tax base in the Pigouvian context could be defined broadly as, "any polluting factor of production/other inputs/outputs/byproducts on which if a tax is imposed would increase the cost of production/consumption/extraction of either the produced/consumed/or the extracted natural resource"

<sup>7</sup> An environmental tax being progressive is not explicitly included in the definition but it is important so as to fulfill the criteria of 'polluter-pay principle'

<sup>8</sup> Emission and effluent taxes are a form of direct taxes as they tax the polluting emissions directly. Product taxes are levied on polluting inputs and outputs which when used in production and consumption respectively cause pollution. Hence, they are a form of indirect ecotaxes. Natural resource taxes, on the other hand, are taxes which are levied on the extraction of scarce natural resources.

## Objectives

The two core objectives of the study are to:

- i. Construct a definition of ecotaxes and using this definition to analyse the status of ecotaxes in India and China.
- ii. Examine the effectiveness of those taxes for which data is available.

## Data and Methodology

The data on revenue for the ecotaxes implemented in India is obtained mostly from CAG reports published online in the year 2014. On the other hand, we were not able to trace the revenue details for the ecotaxes levied in China. An extensive synthetic review of literature has been conducted to map the status of ecotaxes in India and China. Even though we could not perform any data analysis due to unavailability of data, we did attempt to comprehensively bring out the fundamental issues related to ecotaxes in India and China by constructing our own definition and then comparing the status of ecotaxes between the two countries. This will not only add to the existing literature on ecotaxes but also help the two governments in re-structuring their ecotaxes.

## Status of Ecotaxes in India and China

In this section we will focus on various environmental taxes that have been levied in India and China to curb environmental degradation. We will analyse these taxes, about which information was obtained from various sources of literature, on the basis of the OECD/EEA database's definition discussed above, and thus will examine whether these taxes can be termed as environmental taxes or not as per the definition that we have constructed. We have grouped these taxes into three categories: emissions and effluent taxes, product taxes and natural resource taxes as discussed above.

## Status of Environmentally Related Taxes<sup>9</sup> in India

We have attempted to map the history of environmentally related taxes in India, but the list is not exhaustive. This is because as per the Constitution of India, most of the environmental goods such as water, forests, soil quality etc. fall under the ambit of the State Government, therefore making the legal structure diverse and thereby complicating the analysis. In total there are seventeen environmentally related taxes, of which sixteen are levied by various states and only one is levied by the Centre. The details are as follows:

- a. **Emission and Effluent Taxes:** There are no taxes in India that can be classified under this category.
- b. **Product Taxes:** There are twelve environmentally related taxes in this category making it the biggest category.

---

<sup>9</sup> Since in this section we analyse the status in India and China according to OECD-EEA database, we refer to these taxes as environmentally related taxes as mentioned in the database.

- i. **Clean Energy Cess:** This cess was the first attempt by the Government of India to introduce an ecotax at the national level. It was introduced in 2010 at a rate of ₹ 50/metric tonne on coal, peat and lignite which are either imported or produced domestically. The rate was increased to ₹ 100/metric tonne in 2014 and then to 200/metric tonne in 2015 (Ministry of Finance 2014, 2015). The revenue from the cess is earmarked for the creation of a "National Clean Energy Fund" (NCEF), which would then be utilised for environmental purposes. The revenue generated in 2010-11 was Rs 10,664.6 million, of which ₹ 2,000 million was earmarked for the Green India Mission and a similar amount was earmarked for environmental remediation programmes (CAG 2014; The Hindu 2011).
- ii. **Gujarat Green Cess:** The Gujarat Government recently passed a bill which will levy ₹ 0.02/unit cess on electricity production through non-renewable sources. It exempts electricity generating companies which have a capacity less than 1,000 KW. Also, the revenue is earmarked for the creation of a Green Energy fund, which will be explicitly targeting environmental purposes and promoting electricity generation through renewable sources. (Government of Gujarat 2011, cited in Mandal, et al. 2013 and Harikumar 2011). This cess is presently not in force because of the ongoing plea of the Government of Gujarat in the Supreme Court against the verdict of the High Court, which invalidated the Gujarat Green Cess Act. But the Supreme Court has stayed the High Court's order on the ground that it is legal for the state government to levy a cess for the protection of masses from environmental problems. The revenue will be collected once the court gives the final verdict (Mandal, et al. 2013).
- iii. **Vehicle Entry Tax:** This tax is levied in four cities of Himachal Pradesh, which are Manali, Rohtang, Solang and Shimla, and in Mussoorie, Uttarakhand. The tax rates in all the four cities are same: Two wheelers - Rs 100 per entry, Cars - Rs 200 per entry, SUVs – Rs 300 per entry and Buses/trucks - Rs 500 per entry. The tax in the first three cities was introduced in 2004 but in Shimla it was introduced only in 2012 (Chauhan 2007).  
Though the Government of Uttarakhand has also imposed a tax on vehicles entering Mussoorie, the rate is very low compared to that in Manali. Heavy vehicles are taxed at a modest amount of ₹ 100 per entry, cars/jeeps at ₹ 30 per entry and two-wheelers only ₹ 5 per entry.
- iv. **Vehicles Tax (on Old Automobiles):** This tax is levied by six states in India at various intervals. Karnataka is the frontrunner in this levy which it imposed in 2002. The basis of the tax is the inefficiency of the vehicles when they become old, thus emitting more pollution. Therefore, in order to dis-incentivise the usage of such vehicles various state governments have levied this tax. As is evident from Table 1, all the states have levied it on both private and commercial vehicles except for Bihar, which levies it only on commercial vehicles. The tax rate for private vehicles ranges from ₹ 250 to ₹ 2,000 whereas for commercial vehicles it ranges from ₹ 200 to ₹ 5,000 annually. Bihar is the only state which levies an ad-valorem tax of 10% as vehicle tax. The details of revenue are available only for Maharashtra, Karnataka and Tamil Nadu. The revenue for Karnataka and Tamil Nadu has been increasing over the years but for

Maharashtra it is showing irregular patterns. This could be due to the recent implementation of the tax, as in Tamil Nadu, and may stabilise with time (Mandal, et al. 2013).

- v. **Ecological Fund and Environment Cess:** Government of Sikkim in 2005 levied a unique cess on non-biodegradable substances that are either produced in the state or imported from other states in order to solve the problem of solid waste. The revenue from the tax is deposited in a fund called the Sikkim Ecological Fund, which is exclusively meant for preserving the ecology of the state (Sikkim 2005, as cited by Mandal et al. 2013). There are two different rates: 1% of the total turnover from the sales of non-biodegradable substances, which include public, private and other organizations and also the individuals. On the other hand, hotels, motels, resorts and lodges are taxed at 5% of their total turnover.
  - vi. **Goa Green Cess:** This cess was levied by the Government of Goa in 2013 so as to reduce the carbon footprint of the state. The rate of the cess was kept below 2% of the sales value of all the polluting products that harm the environment in any manner. Since this tax is of recent origin further details about the revenue, usage of the fund etc. are not available (Mandal, et al. 2013).
- c. **Natural Resource Tax:** There are five states that levy a tax on the forest produce that belongs to this category.
- i. **Forest Development Tax:** This is an ad-valorem tax which is levied at rates that vary from 1% to 12% on forest produce in the states of Maharashtra, Kerala, Orissa, Karnataka and Madhya Pradesh. Of these five, three states - Madhya Pradesh, Kerala and Maharashtra - levy the tax at a rate of 5%. On the other hand, Orissa has various rates such as 1%, 2% and 4% on bamboo, tendu leaves and timber (Government of Maharashtra 1983; Government of Kerala 1986; Government of Madhya Pradesh 2009; Barik 2003). Karnataka is the only state which has an exclusive fund called 'Forest Development Fund' earmarked for the development of forest reserves in Karnataka through forest plantations and other measures (Karnataka 2009).

### **Status of Ecotaxes in China**

In total there are nine environmentally related taxes in China, as per our preliminary research. The pollution levy system, which is listed at the bottom of Table 2, is one which is not considered an ecotax in the literature. The details of these taxes are as follows<sup>10</sup>:

- a. **Emission and Effluent Taxes:** Like India, there are no taxes in China in this particular category.
- b. **Product Taxes:** There are three taxes that come under this category.
  - i. **Value Added Tax:** It was introduced in 1994 but revised in 2008. The tax base is the sales of those products whose consumption or production causes negative externalities. Thus, it comes under the category of product tax. There are two rates at which these products are charged:

---

<sup>10</sup> For Further details please refer to table 2

13% and 17%. Goods that come under the former category are mostly energy products such as LPG, natural gas, coal/charcoal etc. Metal and non-metal products are also included in this list. Only two products are part of the latter rate: crude oil and vehicles (Ministry of Finance - China 2007)<sup>11</sup>.

- ii. **Vehicle and Vessel Usage Tax:** There are two taxes that are part of this particular tax: Vehicle Acquisition Tax and Vehicle (and Vessel) Tax. Vehicle Acquisition Tax was introduced in 2001 and is only a one-time tax which is levied at the rate of 10% on the value of the vehicle purchased whereas Vehicle (and Vessel) Tax is charged according to the size of the vehicle and was introduced in 2006. The former is collected by the Central government while the latter is collected by the local government. The major purpose of the Vehicle (and Vessel) Tax is to fund the local governments for maintenance of public roads and infrastructure (Xu 2012; Zhong and Jian 2003; cited in BMZ and GTZ 2004).
  - iii. **Consumption Tax:** This was introduced in 1994 and revised in 2008. There are seven environmentally related products on which this tax is levied at varying rates. These are all petroleum products which produce pollution either as inputs or as outputs. The tax was amended with the purpose of altering the behaviour of consumers so as to restrict the pollution caused by them.
- c. **Natural Resource Taxes:** There are four kinds of taxes under this category.
- i. **Urban and Township Land Use Tax:** It was introduced in 1988 and amended in 2006. It is classified under the category of natural resource taxes because the major purpose of this tax is to ensure effective utilisation of land resources, and thus help fix a price for this scarce natural resource. The tax rate is higher for bigger cities as compared to small and medium cities, thus incorporating the resource's relative scarcity. But it is minimal for industrial and mining districts, and this goes against the very purpose of the tax because industrial and mining activities also lead to degradation of land (KPMG 2007; Zhong and Jian 2003, cited in BMZ and GTZ 2004).
  - ii. **Resource Tax:** This tax is levied on the usage of natural resources such as crude oil, natural gas, coking coal etc. at varying rates. It was introduced in 1984 and was revised in 2011. The tax is collected by the local government except for the tax paid by offshore enterprises, which is collected by the Central Government (State Council 2011; Xu 2012; Zhang 2014; Zhong and Jian 2003, cited in BMZ and GTZ 2004). According to BMZ and GTZ (2004), the major purpose of this tax is to create competition in the market by regulating the income.
  - iii. **City Maintenance and Construction Tax:** This is mostly levied to raise revenue for the construction and maintenance of urban infrastructure. The maintenance also includes environmental sanitation. It was introduced in 1985 and is managed by local governments except for the revenue which is paid by the railway department, insurance companies and banks' headquarters. The tax rate is again in accordance with the cost differential between a city, town and other areas. Therefore, city rates are highest at 7%, followed by counties and

---

<sup>11</sup> As accessed from URL: <http://www.china.org.cn/english/LivinginChina/202770.htm>

towns at 5% and other areas at 1%. Part of the revenue is also earmarked for the improvement of urban air and water quality (Xu 2012; Zhong and Jian 2003, cited in BMZ and GTZ 2004).

iv. **Farmland Occupation Tax:** This was introduced in 1987 and the rate varies from 2.5 Yuan to 9 Yuan per square meter. It is classified under this category because it helps in conserving farm land, which is now being degraded (Wang and Zhou 2009, cited in Xu 2012; Zhong and Jian 2003, cited in BMZ and GTZ 2004; Zi 2009).

d. **Pollution Levy System:** The pollution levy system is one of the oldest regulatory systems that is in place in China. It was levied in 1982 but was reformed in 2003. The major purpose behind the reform was to charge the polluters more so as to meet the needs of the environmental pollution agency of China. The reason it is called a levy or a charge system and not a tax is because the firms are paid back by providing subsidies if they undertake pollution abatement projects. The funds generated are shared between the Central and local governments at a ratio of 1:9. Various cities have various rates (Wang and Wheeler 1996, cited in Wang and Chen, n.d.; Xu 2012).

## Analysing the Status of Ecotaxation

After categorising and describing the environmentally related taxes as per Milne and Andersen (2012) and OECD/EEA database definition cited in Steinbach, et al. (2009) respectively, here we will analyse these taxes based on the definition which was constructed above. Further, we will also examine the effectiveness of these taxes in both the countries with the help of existing literature.

## Examining the Taxes through the Author's Definition

Here we will use the two fundamental aspects of ecotaxes, i.e. tax base and progressive tax rate, to analyse whether the taxes that were deemed as environmentally related taxes by OECD/EEA database can really be adjudged as ecotaxes. We have compiled the list of ecotaxes for India and China in Table 1 and 2 respectively. As is evident from the tables, the last two columns analyse which taxes can be deemed as ecotaxes and the underlying reason according to our definition. As per the analysis, only seven out of seventeen environmentally related taxes can be called as ecotaxes in India. For China, on the other hand, the number of ecotaxes didn't decline substantially. Five out of seven environmentally related taxes were examined as environmental taxes.

In the case of India, most of these taxes didn't have a progressive rate structure even though some of them had an environmentally relevant tax base. For instance, Ecology Fund and Environment Cess (Sikkim), Clean Energy Cess (India), Gujarat Green Cess etc., are environmentally related taxes but in a strict sense they can't be termed as ecotaxes. A progressive rate structure is essential for environmental taxation because this would be in accordance with its underlying idea, i.e. to charge more on a more polluting product so as to dis-incentivise its usage and enforce the 'polluter-pay approach'. For instance, in the case of 'Clean Energy Cess' in India, the cess would really be effective only when a progressive rate structure is followed. This is because it will then give appropriate disincentives to firms which use coal that has high carbon content by charging a higher rate. Also, it is

important to note that the progressive rate structure should appropriately reflect the relationship between various types of polluting products and the effect on the environment. For example, in the case of 'Forest Development Tax' of Karnataka, even though the tax rate is progressive it bears no relation to the scarcity of forest products. Instead, the Government should have charged high rates on those forest produce which are scarce such as sandalwood (please refer to table 1).

The Vehicle Tax (on old automobiles) in several states serves as a good example of an ecotax. This is because both the conditions are fully satisfied. The tax base is polluting old vehicles that are inefficient and thus pollute more than the new vehicles; the tax rate is more for commercial vehicles which pollute more and wear out their engines early when compared to private vehicles. Here, the progressive rate structure is evident in two ways. First, it charges commercial vehicles more and second, the commercial vehicles are considered to be old after just 7-8 years unlike private vehicles which are taxed only after 15 years. The Vehicle Entry Tax that is levied by the Government of Himachal Pradesh and Uttarakhand is yet another case of an ecotax in India.

China's case is similar to that of India, but only two taxes were not considered to be ecotaxes: Urban and Township Land Use Tax and Farmland Occupation Tax. This is because the former doesn't tax the industrial and mining districts highly even though they affect the environment negatively. The latter, on the other hand, has insufficient information because the rate structure is progressive but further details on its relation to the environment is not available. Thus, we can't decide whether it can be called an ecotax or not. The rate structure of consumption tax in China is progressive but the tax rates are less; thus, it may not serve the purpose, and is discussed below.

### **Effectiveness of Ecotaxes**

An analysis of ecotaxes would be incomplete without studying the effectiveness of ecotaxes on environment, various sectors of economy and people. Thus, we classify the parameters which are critical for analysing the performance of an ecotax as: first, the environmental benefits achieved; second, incidence of ecotaxes on people (especially the poor), firms and economy and third, utilisation of the revenue generated from the taxes. Unfortunately we do not have many studies that have analysed the effects of ecotaxes in India and China. This is because environmental taxes are a recent concept in both the countries, and thus there aren't many examples of such taxes. As we observed in the previous section, in total there are only twenty-four environmentally related taxes that exist in both the countries. Of these, five out of seven environmentally related taxes in China were revised after the year 2006<sup>12</sup> and in India all the taxes were levied only after the year 2002<sup>13</sup>. In addition, most of these taxes are not ecotaxes as per our definition. Thus, there exists a severe paucity of studies that have analysed the performance of ecotaxes.

Even though the literature on the effects of ecotaxes in India and China is limited, we did get some studies which have analysed a few parameters listed above. For India, we have studies that have analysed only the usage of revenue in the funds created by clean energy cess, forest development tax

---

<sup>12</sup> Pollution levy, which is not an ecotax, was revised in 2003

<sup>13</sup> Forest Development Taxes levied by Maharashtra and Kerala were introduced in 1983 and 1986 respectively, but as we examined in the last section, they can't be deemed as ecotaxes; thus the exclusion.

in Karnataka and ecology fund and environment cess in Sikkim. While analysing the 'national clean energy fund', which has been created by levying a clean energy cess by Government of India, the authors (Paliwal and Goyal 2013) found a lack of good governance. According to them, there are four major shortcomings in the process of releasing the funds: first, there aren't any proper eligibility criteria; second, the selection of green projects, for which the fund has been created, lacks transparency; third, the sanctioning of these projects lacks proper technical expertise; and fourth, there isn't any monitoring mechanism. Also, the funds are not transferred expeditiously from the government to the NCEF. According to The Hindu (2015), around 60% of the funds generated through the levy of the cess are still not transferred to the NCEF.

In Karnataka, the forest development fund created by levying the forest development tax (FDT) also has serious loopholes. CAG (2014) points out two major shortcomings: first, the collection of the forest development tax, since its inception in 2009, is not proper and second, on an average, only 7.3% of the fund has been utilised, thus leaving a corpus of about ₹ 9,640.2 million idling. Further, Nihal (2013) also points out that cases of bribery have been reported in the collection of FDT. The Ecology Fund and Environment Cess, levied by the Government of Sikkim, is the only exception in utilisation of funds. This is because a study by Mandal, et al. (2013) found that around 20.5% of the total fund generated between 2007 and December 2012 have been utilised in funding several environmental activities by the Government. According to them, there is a need for an impact evaluation study to assess its effectiveness appropriately.

For China we managed to get studies that analysed three environmental taxes and the pollution levy system. According to Xiao and Ju (2014), the purpose of consumption tax is defeated as it leads to an increase in total fuel consumption even though the sale of more efficient new cars increased. These results are based on the assumption made for the average fuel efficiency of outside goods. Also, it leads to an overall decline in social welfare, especially consumer surplus. Studies have also analysed the pollution levy system that has been implemented since 1982 in China (Wang and Wheeler 1996, cited in Wang and Chen n.d.). According to the authors, pollution emissions are responding significantly to the charges that are levied in their provinces. However, there seems to be ambiguity on whether the charges are providing incentives for polluters to invest in pollution abatement technologies.

However, Wang and Chen (n.d.) perform econometric analysis and find that, *'the Chinese pollution charge-subsidy system have been effective in promoting investment in firm-level pollution abatement and have significantly contributed to the national pollution control effort.'* The farmland occupations tax, which was introduced in 1987, also seems to be facilitating in preserving land by preventing the exploitation of farmland (Xu 2012).

## Conclusion

The comparison of the status of ecotaxes in India and China, on the basis of OECD-EEA database and our own definition, primarily reveals that environmental taxes are a recent concept in both the countries, and thus there aren't many examples of such taxes. In total, there are only twenty-four

environmentally related taxes that exist in both the countries. Of these, five out of seven environmentally related taxes in China were revised after the year 2006 and in India all the taxes were levied only after the year 2002. In addition, only seven and five environmentally related taxes in India and China respectively can be deemed as ecotaxes as per our definition.

There is a severe paucity of studies that have analysed the performance of ecotaxes. Limited studies on the revenue utilisation of funds generated by clean energy cess and FDT of Karnataka reveal that the funds are not utilised properly and there are cases of corruption and mismanagement. Studies for China, on the other hand, reveal that the purpose of consumption tax is defeated as it leads to increases in total fuel consumption. The pollution levy system did have an effect in curbing emissions and giving incentives for firms to invest in abatement methods. Also, none of the countries have targeted all the four aspects of environment - land, air, water and biodiversity and forest - through ecotaxes.

## References

- Barik, S (2003). In the Tax Bracket Again. *Down to Earth*. [http://www.downtoearth.org.in/node/13501?quicktabs\\_1=0](http://www.downtoearth.org.in/node/13501?quicktabs_1=0) (accessed on May 20, 2014).
- BMZ and GTZ (2004). *Environmental Fiscal Reform for Sustainable Development and Poverty Reduction*. Eschborn: Deutsche Gesellschaft für.
- CAEP-TERI (2011). *Environment and Development: China and India*. New Delhi: TERI Press.
- CAG (2014). [http://saiindia.gov.in/english/home/Our\\_Products/state\\_account/state\\_account.html](http://saiindia.gov.in/english/home/Our_Products/state_account/state_account.html) (accessed on May 29, 2014).
- Chauhan, P (2007). *Govt Shelves \_Green Tax' Proposal*. <http://www.tribuneindia.com/2007/20070130/himachal.htm> (accessed on May 23, 2014).
- Chelliah, Raja J, Paul P Appasamy, U Sankar and R Pandey (2007). *Ecotaxes on Polluting Inputs and Outputs*. New Delhi: Academic Foundation.
- Eurostat (2001). *Environmental Taxes-A Statistical Guide*.
- Government of China (2015). *Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions*. Government of China.
- Government of India (2015). *India's Intended Nationally Determined Contribution: Working Towards Climate Justice*. New Delhi: Government of India.
- Government of Gujarat (2011). *Gujarat Geen Cess Act*.
- Government of Karnataka (2009). *The Karnataka Forest Act, 1963*.
- Government of Kerala (1986). *The Kerala Forest (Amendment) Act, 1986*.
- Government of Maharashtra (1983). *Maharashtra Forest Development (Tax On Sale Of Forest Produce)*.
- Government of Madhya Pradesh (2009). *The Madhya Pradesh Karadhan (Amendment) Act, 2009*.
- Government of Sikkim (2005). *Sikkim Ecology Fund and Environment Cess Act 2005*.
- Harikumar, B (2011). *Gujarat Introduces Green Cess*. <http://www.kseboa.org/news/gujarat-introduces-greenness-of-re-002-per-unit-of-electricity-generated-30031547.html> (accessed on 25 May, 2014).
- IEA (2013). *CO2 Emissions From Fuel Combustion Highlights*. Paris: IEA.

- KPMG (2007). *New Changes to PRC Urban and Township Land-Use Tax*. KPMG.
- Mandal, Koyel, Rajesh Rangarajan and Chayan Bandopadhyay (2013). *Fiscal Instruments for Environment and Climate Change: Experience from Indian States*. IFMR.
- Milne, Janet E and Mikael Skou Andersen (2012). Introduction to Environmental Taxation Concepts and Research. In Janet E Milne and Mikael Skou Andersen (eds), *Handbook of Research on Environmental Taxation*. Cheltenham: Edward Elgar Publishing.
- Ministry of Finance (2014). *Notification No. 20/2014-Central Excise*. New Delhi: Government of India.
- (2015). *Notification No. 1/2015-Clean Energy Cess*. New Delhi: Government of India.
- Ministry of Finance - China (2007). *Briefing of VAT Under China's Tax System*. <http://www.china.org.cn/english/LivinginChina/202770.htm> (accessed on 2014).
- MoEF (2009). *State of Environment Report*. Government of India.
- MoEP (2013). *State of Environment in China*.
- Nihal (2013). *Mining in Bellary – A Policy Analysis*. [http://adrindia.org/sites/default/files/EPW\\_Mining\\_Article.pdf](http://adrindia.org/sites/default/files/EPW_Mining_Article.pdf) (accessed on October 6, 2014).
- OECD (2006). *The Political Economy of Environmentally Related Taxes 26*.
- Paliwal, Ankur and Abhinav Goyal (2013). Crores to Gamble. *Down To Earth*. <http://www.downtoearth.org.in/content/crores-gamble> (accessed on October 5, 2014).
- Planning Commission (2007). *Environment and Environmental Regulatory Mechanisms*. New Delhi: Government of India.
- State Council (2011). *People's Republic of China State Council Order No. 605*. [http://www.gov.cn/zwgk/2011-10/10/content\\_1965540.htm](http://www.gov.cn/zwgk/2011-10/10/content_1965540.htm) (accessed on September 30, 2014).
- Steinbach, Nancy, Viveka Palm, Maja Cederlund, Anda Georgescu and Julie Hass (2009). *Revision of SEEA 2003: Outcome Paper: Environmental Taxes*. UNStats: [http://unstats.un.org/unsd/envaccounting/londongroup/meeting14/LG14\\_18a.pdf](http://unstats.un.org/unsd/envaccounting/londongroup/meeting14/LG14_18a.pdf) (accessed on March 21, 2011).
- Taylor, T, M Fredotovic, D Povh and A Markandya. Sustainable Tourism and.
- The Hindu (2011). <http://www.thehindu.com/business/Economy/article1498700.ece#> (accessed on May 25, 2014).
- (2010). <http://www.thehindu.com/news/national/article438506.ece> (accessed on May 25, 2014).
- (2015). Green Energy Sector Gets Only a Small Share of NCEF. *The Hindu*, 46, No 198.
- Wang, Hua and David Wheeler (1996). Pricing Industrial Pollution in China. *Policy Research Working Paper 1644*. World Bank.
- Wang, Hua and Ming Chen. *How the Chinese System of Charges and Subsidies Affects Pollution Control Efforts*. China's Top Industrial Polluters.
- Wang, X and Y F Zhou (2009). Greening Taxation System in China. In Lin (ed), *7 Critical Issues in Environmental Taxation*.
- Xiao, Junji and Heng Ju (2014). Market Equilibrium And The Environmental Effects Of Tax Adjustments In China's Automobile Industry. *The Review of Economics and Statistics*.

- Xu, Yan (2012). Environmental Taxation in China. In Janet E Milne and Mikael Skou Andersen (eds), *Handbook of Research on Environmental Taxation*. Cheltenham: Edward Elgar Publishing.
- Zhang, Zhong Xiang (2014). Energy Prices, Subsidies and Resource Tax Reform in China. *CCEP Working Paper 1406*.
- Zhong, Ma and Wu Jian (2003). *China's Environmental Fiscal System and Its Reform*.
- Zi, Cai Nong (2009). Regulations on the Specific Policy for the Farmland Occupation Tax. <http://www.chinatax.gov.cn/n6669073/n6669088/9028276.html> (accessed on October 1, 2014).

**Table 1: Classification of Ecotaxes in India as per Author's Definition**

Sl. No.	Category of Ecotax	List of Ecotax	Location	Tax Rate	Tax Base	Author's Definition	Reason	Reference
1	Product Tax	Clean Energy Cess	India	₹ 200/metric tonne on coal, peat, lignite	Coal	No	Tax rate is not progressive	Ministry of Finance (2015) *Paliwal and Goyal (2013)
2	Product Tax	Gujarat Green Cess	Gujarat	₹ 0.02/unit of electricity generated through non-renewable sources	Electricity produced from non-renewable source	No	Tax rate is not progressive	1. Government of Gujarat (2011), cited in Mandal et al. (2011) 2. Harikumar (2011)
3	Product Tax	Vehicle Entry Tax	Himachal Pradesh: Manali, Rohtang, Solang & Shimla	<b>Car:</b> ₹ 200/entry <b>Two Wheelers:</b> ₹ 100/entry <b>SUV:</b> ₹ 300/entry <b>Bus/Truck:</b> ₹ 500/entry		Yes	Tax rate is progressive and Tax Base is appropriate as additional vehicular load due to surge in tourism causes pollution	Chauhan (2007)
4	Product Tax	Vehicle Entry Tax	Uttarakhand Mussoorie	<b>Cars/Jeeps:</b> ₹ 30/entry <b>Two Wheelers:</b> ₹ 5/entry <b>Heavy Vehicles:</b> ₹ 100/entry		Yes	Tax rate is progressive and Tax Base is appropriate as additional vehicular load due to surge in tourism causes pollution	Kunwar (2009)
5	Product Tax	Vehicles Tax (on Old Automobiles)	Andhra Pradesh	<b>Private Vehicles older than 15 years:</b> 1. Motorcycles: ₹ 1000 2. Other Vehicles: ₹ 5000 <b>Commercial Vehicles Older than seven-eight yrs.:</b> 1. Other Vehicles: 5000	Vehicle	Yes	Tax rate is progressive because it charges more on commercial vehicles which tend to be more inefficient and Tax Base is appropriate as old vehicles are inefficient	1. Govt. of Andhra Pradesh (2013) as cited by Mandal et al. (2013) 2. Mandal et al. (2013)
6	Product Tax	Vehicles Tax (on Old Automobiles)	Tamil Nadu	<b>Private Vehicles older than 15 years:</b> 1. Motorcycles: ₹ 500 2. Other Vehicles: ₹ 1000 <b>Commercial Vehicles Older than seven-eight yrs.:</b> 1. Other Vehicles: ₹ 500 2. Auto rickshaw: ₹ 200	Vehicle	Yes	Tax rate is progressive because it charges more on commercial vehicles which tend to be more inefficient and Tax Base is appropriate as old vehicles are inefficient	1. Govt. of Tamil Nadu (2013) as cited by Mandal et al. (2013) 2. Mandal et al. (2013)
7	Product Tax	Vehicles Tax (on Old Automobiles)	Rajasthan	<b>Private Vehicles older than 15 years:</b> 1. Motorcycles: ₹ 250 2. Other Vehicles: ₹ 500 <b>Commercial Vehicles Older than seven-eight yrs.:</b> 1. Other Vehicles: 200	Vehicle	Yes	Tax rate is progressive because it charges more on commercial vehicles which tend to be more inefficient and Tax Base is appropriate as old vehicles are inefficient	Mandal et al. (2013)

8	Product Tax	Vehicles Tax (on Old Automobiles)	Karnataka	<p><b>Private Vehicles older than 15 years:</b> 1. Motorcycles: ₹ 250 2. Other Vehicles: ₹ 500</p> <p><b>Commercial Vehicles Older than seven-eight yrs.:</b> 1. Other Vehicles: 200</p>	Vehicle	Yes	Tax rate is progressive as it charges more on commercial vehicles which tend to be more inefficient and Tax Base is appropriate as old vehicles are inefficient	<p>1. Govt. of Karnataka (2002) as cited by Mandal et al. (2013)</p> <p>2. Mandal et al. (2013)</p>
9	Product Tax	Vehicles Tax (on Old Automobiles)	Bihar	<p><b>All commercial vehicles (except three wheelers, tractors, and trailers) older than 12 yrs:</b> 10% of the vehicle tax</p>	Vehicle	No	Tax rate is flat, also it doesn't charge private vehicles which form an equally important source of air pollution	<p>1. Mandal et al. (2013)</p> <p>2. Govt. of Bihar (2010)</p>
10	Product Tax	Vehicles Tax (on Old Automobiles)	Maharashtra	<p>Vehicles older than 15 years:</p> <p><b>1. Petrol Engine:</b> ₹ 3000 (4-wheeler) &amp; ₹ 2000 (2-wheeler)</p> <p><b>2. Diesel Engine:</b> ₹ 3500</p> <p><b>3. Commercial Vehicles</b> are charged acc. to their capacity &amp; weight</p>	Vehicle	Yes	Tax rate is progressive as it charges more on commercial vehicles which tend to be more inefficient and Tax Base is appropriate as old vehicles are inefficient	<p>Shivadekar (2010)</p> <p>*Mandal et al. (2013)</p> <p>CAG (2011)</p> <p><a href="http://saiindia.gov.in/english./home/Our_Products/Audit_Report/Goa%20Government_Wise/state_audit/recent_reports/Maharashtra/2011/Revenue/Chap_5.pdf">http://saiindia.gov.in/english./home/Our_Products/Audit_Report/Goa Government_Wise/state_audit/recent_reports/Maharashtra/2011/Revenue/Chap_5.pdf</a></p>
11	Product Tax	Ecology Fund and Environment Cess	Sikkim	<p><b>1. Everyone that brings non-biodegradable materials in the state:</b> 1% of total turnover from the sale of non-biodegradable materials</p> <p><b>2. Hotels, Lodges, Motels and Resorts:</b> 5% of their turnover</p>	There are a total of 49 non-biodegradable materials that are listed	No	Even though rate is progressive it should charge more for better control of pollution. Purpose behind charging more on hotels seems to be revenue driven	<p>1. Govt. of Sikkim (2005) cited in Mandal, et al. (2013)</p>
12	Product Tax	Green Cess	Goa	Not exceeding 2% of the sales value of the product	All the polluting products that harm environment in any manner	No	Tax rate is not progressive	<p>Govt. of Goa (2013) cited in Mandal et al., (2013)</p>
13	Natural Resource Tax	Forest Development Tax	Karnataka	Tax @ 8% and 12% on forest produce		No	Even though there is a differential tax rate, the rate differential is not for conserving a scarce forest resource	<p>Govt. of Karnataka (2009) *CAG (2013)</p> <p><a href="http://www.saiindia.gov.in/English/home/Our_Products/Audit_Report/Government_Wise/state_audit/recent_repor">http://www.saiindia.gov.in/English/home/Our_Products/Audit_Report/Government_Wise/st</a></p>

								ts/Karnataka/2013/Report_5/Chap_3.pdf ** <b>Nihal (13) URL:</b> <a href="http://adrindia.org/sites/default/files/EPW_Mining_Article.pdf">http://adrindia.org/sites/default/files/EPW_Mining_Article.pdf</a>
14	Natural Resource Tax	Forest Development Tax	Maharashtra	Tax @ 5% on sale of forest produce		No	Tax rate is not progressive	Govt. of Maharashtra (1983)
15	Natural Resource Tax	Forest Development Tax	Orissa	Tax @ 16% on Tendu leaves 4% on timber 1% on bamboo In 2014 tax on Tendu leaves reduced to 2%		No	Even though there is a differential rate structure the purpose of the tax is to raise revenue, as obtained from the literature	Barik (2003)
16	Natural Resource Tax	Forest Development Tax	Kerala	Tax @ 5% on sale of forest produce except charcoal, timber, cane, bamboo & firewood		No	Tax rate is not progressive	Govt. of Kerala (1986)
17	Natural Resource Tax	Forest Development Tax	Madhya Pradesh	Tax @ 5% on sale & supply of timber log		No	Tax rate is not progressive	Govt. of Madhya Pradesh (2009)

Source: As mentioned in the Table

**Table 2: Examining the Status of Ecotaxes in China as per Author's Definition**

Sl. No.	Type of Ecotax	List of Taxes	Rationale/ Focus	Tax Base	Tax Rate/Subsidy	Author's Definition	Reason	References
1	Product Tax	VAT		Sales of the Product	<p><b>13%:</b> LPG, natural gas, coal/charcoal, chemical fertilizers, agricultural chemicals, selected metal mineral products and non-metal mineral products, coal</p> <p><b>17%:</b> Crude oil, vehicles</p>	Yes, but the rate structure could further be made progressive	Tax rate is progressive and Tax Base is appropriate as it includes all petroleum products and other polluting goods	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <b>URL:</b> <a href="http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. * <b>URL:</b> <a href="http://www.china.org.cn/english/LivinginChina/202770.htm">http://www.china.org.cn/english/LivinginChina/202770.htm</a>
2	Product Tax	Vehicle and Vessel usage tax	<b>Vehicle (and vessel tax):</b> Provide funds for local governments to upgrade local public roads & maintain infrastructure		<p><b>1. Vehicle Acquisition Tax:</b> 10% of the vehicle's value</p> <p><b>2. Vehicle (and vessel tax):</b> Taxed acc. to the size of vehicle and cargo vehicles and motor tricycles are taxed per ton of net capacity</p>	<p>1. Vehicle Acquisition Tax: No</p> <p>2. Vehicle (and vessel tax): Yes</p>	<p>1. Vehicle Acquisition Tax is a one-time tax, hence it's not progressive</p> <p>2. As per the available information the tax seems to be progressive and tax base is appropriate as vehicles are a major cause of air pollution</p>	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <b>URL:</b> <a href="http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. Xu (2012)
3	Product Tax	Consumption Tax	Amendment was made to constrain the consumption of certain goods, modify behaviour & raise revenues		<p><b>**1. Gasoline:</b></p> <p>a) unleaded petrol = 1 Yuan/lt.</p> <p>b) leaded gasoline = 1.4 Yuan/lt.</p> <p>2. Diesel = 0.8 Yuan/lt.</p> <p>3 aviation kerosene = 0.8 Yuan/lt.</p> <p>4 naphtha = 1 Yuan/lt.</p> <p>5. Solvent oil = 1 Yuan/lt.</p> <p>6. Lubricants = 1 Yuan/lt.</p> <p>7. Fuel = 0.8 Yuan/lt.</p>	Yes	Tax rate is progressive and Tax Base is appropriate as it includes all petroleum products and other polluting goods	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <b>URL:</b> <a href="http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. **Shui (2008) <a href="http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8734242.html">http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8734242.html</a> 3. *Xiao and Ju (2011)
4	Natural Resource Tax	Urban and Township Land use Tax	Promoting effective use of urban land resources & adjusting differential rents of urban land	Land	<p><b>*Taxes are per square meter</b></p> <p><b>Big Cities:</b> 1.5-30 Yuan</p> <p><b>Medium Cities:</b> 1.2-24</p> <p><b>Small Cities:</b> 0.9-18</p> <p><b>County, Towns, Industrial &amp; Mining Districts:</b> 0.6-12</p>	No	Even though the relative scarcity of land is taken care of by charging big cities more than small cities, industrial and mining districts are not charged steeply	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <b>URL:</b> <a href="http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">http://www.giz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a>

								2. *KPMG (07): <a href="https://hk.lexiscn.com/law/tmppdf/070322.China%20ale rt.English.2007_8.pdf">https://hk.lexiscn.com/law/tmppdf/070322.China%20ale rt.English.2007_8.pdf</a>
5	Natural Resource Tax	Resource Tax	*The main purposes of these however are not to promote conservation or sustainable use of natural resources, rather to adjust the incomes of companies and promote market competition.	Various mineral and petroleum resources	1. Crude oil and natural gas: 5-10% of sales 2. Coking Coal: 8-20 Yuan/ton; Other coal: 0.3-5 Yuan/ton 3. Other non-metallic mineral ore: 0.5-20 Yuan/ton or kg or cubic metre or carat 4. Ferrous metal ores: 2-30 Yuan/ton 5. Rare earth mine: 0.4-60 per ton and other non-ferrous metal ores: 0.4-30 per ton 6. Solid salt: 10-60 Yuan/ton and Liquid Salt: 2-10 Yuan/ton	Yes	Tax rate is progressive and Tax Base is appropriate as it includes rare natural resources	*1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <a href="http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">URL:http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. State Council (2011) <a href="http://www.qov.cn/zwqk/2011-10/10/content_1965540.htm">http://www.qov.cn/zwqk/2011-10/10/content_1965540.htm</a> 3. Laney Zhang (2011) <a href="http://www.loc.gov/lawweb/servlet/lloc_news?disp3_l205402925_text">http://www.loc.gov/lawweb/servlet/lloc_news?disp3_l205402925_text</a> 4. Xu (2012)
6	Natural Resource Tax	City Maintenance & Construction Tax	*Expanding & stabilising source of funds for urban infrastructure that includes environmental sanitation		*Cities: 7%; Counties & towns: 5% & Other Areas: 1%	Yes	Tax rate is progressive and Tax Base is appropriate as it helps in maintaining the resource	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <a href="http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">URL:http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. *Xu (2012)
7	Natural Resource Tax	Farmland Occupation Tax		Farmland	2.5 - 9 Yuan per square meter	Insufficient information	Information on Tax rate is insufficient	1. Ma Zhong and Wu Jian (2003) as cited in BMZ/GTZ (2004) <b>URL:</b> <a href="http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf">http://www.qiz.de/fachexpertise/downloads/en-environmental-fiscal-reform-2004.pdf</a> 2. Zi (2009) <a href="http://www.chinatax.gov.cn/n6669073/n6669088/9028276.html">http://www.chinatax.gov.cn/n6669073/n6669088/9028276.html</a> 3. Wang et al. (1999) as cited in Xu (2012)

8		Pollution Levy System	*Revision in 2003 was done with the purpose of charging the polluters more and also to meet EPA's pollution abatement cost	*Waste Water, Waste gas, Solid Waste & Noise Pollution	*SO <sub>2</sub> : RMB 0.63/kg (various cities have various rates)	No	Doesn't satisfy the definition of a tax as the payments are required	1. *Xu (2012) 2. **Wang and Wheeler (96) as cited in Wang and Chen (n.d)
---	--	-----------------------	--	--	--	----	--	---

Source: As mentioned in the Table

## Recent Working Papers

- 291 **Living Arrangement Preferences and Health of the Institutionalised Elderly in Odisha**  
Akshaya Kumar Panigrahi and T S Syamala
- 292 **Do Large Agglomerations Lead to Economic Growth? Evidence from Urban India**  
Sabyasachi Tripathi
- 293 **Representation and Executive Functions of Women Presidents and Representatives in the Grama Panchayats of Karnataka**  
Anand Inbanathan
- 294 **How Effective are Social Audits under MGNREGS? Lessons from Karnataka**  
D Rajasekhar, Salim Lakha and R Manjula
- 295 **Vulnerability Assessment Of The Agricultural Sector In Yadgir District, Karnataka: A Socio-Economic Survey Approach**  
Sarishthi Attri and Sunil Nautiyal
- 296 **How Much Do We Know about the Chinese SEZ Policy?**  
Malini L Tantri
- 297 **Emerging Trends in E-Waste Management - Status and Issues  
A Case Study of Bangalore City**  
Manasi S
- 298 **The Child and the City: Autonomous Migrants in Bangalore**  
Supriya RoyChowdhury
- 299 **Crop Diversification and Growth of Maize in Karnataka: An Assessment**  
Komol Singha and Arpita Chakravorty
- 300 **The Economic Impact of Non-communicable Disease in China and India: Estimates, Projections, and Comparisons**  
David E Bloom, Elizabeth T Cafiero, Mark E McGovern, Klaus Prettnner, Anderson Stanciole, Jonathan Weiss, Samuel Bakkia and Larry Rosenberg
- 301 **India's SEZ Policy - Retrospective Analysis**  
Malini L Tantri
- 302 **Rainwater Harvesting Initiative in Bangalore City: Problems and Prospects**  
K S Umamani and S Manasi
- 303 **Large Agglomerations and Economic Growth in Urban India: An Application of Panel Data Model**  
Sabyasachi Tripathi
- 304 **Identifying Credit Constrained Farmers: An Alternative Approach**  
Manojit Bhattacharjee and Meenakshi Rajeev
- 305 **Conflict and Education in Manipur: A Comparative Analysis**  
Komol Singha
- 306 **Determinants of Capital Structure of Indian Corporate Sector: Evidence of Regulatory Impact**  
Kaushik Basu and Meenakshi Rajeev
- 307 **Where All the Water Has Gone? An Analysis of Unreliable Water Supply in Bangalore City**  
Krishna Raj
- 308 **Urban Property Ownership Records in Karnataka: Computerized Land Registration System for Urban Properties**  
S Manasi, K C Smitha, R G Nadadur, N Sivanna, P G Chengappa
- 309 **Historical Issues and Perspectives of Land Resource Management in India: A Review**  
M S Umesh Babu and Sunil Nautiyal
- 310 **E-Education: An Impact Study of Sankya Programme on Computer Education**  
N Sivanna and Suchetha Srinath
- 311 **Is India's Public Debt Sustainable?**  
Krishanu Pradhan
- 312 **Biomedical Waste Management: Issues and Concerns - A Ward Level Study of Bangalore City**  
S Manasi, K S Umamani and N Latha
- 313 **Trade and Exclusion: Review of Probable Impacts of Organised Retailing on Marginalised Communities in India**  
Sobin George
- 314 **Social Disparity in Child Morbidity and Curative Care: Investigating for Determining Factors from Rural India**  
Rajesh Raushan and R Mutharayappa
- 315 **Is Access to Loan Adequate for Financing Capital Expenditure? A Household Level Analysis on Some Selected States of India**  
Manojit Bhattacharjee and Meenakshi Rajeev
- 316 **Role of Fertility in Changing Age Structure in India: Evidence and Implications**  
C M Lakshmana
- 317 **Healthcare Utilisation Behaviour in India: Socio-economic Disparities and the Effect of Health Insurance**  
Amit Kumar Sahoo
- 318 **Integrated Child Development Services in India – A Sub-National Review**  
Jonathan Gangbar, Pavithra Rajan and K Gayithri
- 319 **The Infrastructure-Output Nexus: Regional Experience from India**  
Sumedha Bajar
- 320 **Uncertainty, Risk and Risk Mitigation: Field Experiences from Farm Sector in Karnataka**  
Meenakshi Rajeev and B P Vani
- 321 **Socio-Economic Disparities in Health-Seeking Behaviour, Health Expenditure and Sources of Finance in Orissa: Evidence from NSSO 2004-05**  
Amit Kumar Sahoo and S Madheswaran
- 322 **Does Living Longer Mean Living Healthier? Exploring Disability-free Life Expectancy in India**  
M Benson Thomas, K S James and S Sulaja
- 323 **Child and Maternal Health and Nutrition in South Asia - Lessons for India**  
Pavithra Rajan, Jonathan Gangbar and K Gayithri
- 324 **Reflecting on the Role of Institutions in the Everyday Lives of Displaced Women: The Case of Ganga-Erosion in Malda, West Bengal**  
Priyanka Dutta

- 325 **Access of Bank Credit to Vulnerable Sections: A Case Study of Karnataka**  
Veerashkekharappa
- 326 **Neighbourhood Development and Caste Distribution in Rural India**  
Rajesh Raushan and R Mutharayappa
- 327 **Assessment of India's Fiscal and External Sector Vulnerability: A Balance Sheet Approach**  
Krishanu Pradhan
- 328 **Public Private Partnership's Growth Empirics in India's Infrastructure Development**  
Nagesha G and K Gayithri
- 329 **Identifying the High Linked Sectors for India: An Application of Import-Adjusted Domestic Input-Output Matrix**  
Tulika Bhattacharya and Meenakshi Rajeev
- 330 **Out-Of-Pocket (OOP) Financial Risk Protection: The Role of Health Insurance**  
Amit Kumar Sahoo and S Madheswaran
- 331 **Promises and Paradoxes of SEZs Expansion in India**  
Malini L Tantri
- 332 **Fiscal Sustainability of National Food Security Act, 2013 in India**  
Krishanu Pradhan
- 333 **Intergrated Child Development Services in Karnataka**  
Pavithra Rajan, Jonathan Gangbar and K Gayithri
- 334 **Performance Based Budgeting: Subnational Initiatives in India and China**  
K Gayithri
- 335 **Ricardian Approach to Fiscal Sustainability in India**  
Krishanu Pradhan
- 336 **Performance Analysis of National Highway Public-Private Partnerships (PPPs) in India**  
Nagesha G and K Gayithri
- 337 **The Impact of Infrastructure Provisioning on Inequality: Evidence from India**  
Sumedha Bajar and Meenakshi Rajeev
- 338 **Assessing Export Competitiveness at Commodity Level: Indian Textile Industry as a Case Study**  
Tarun Arora
- 339 **Participation of Scheduled Caste Households in MGNREGS: Evidence from Karnataka**  
R Manjula and D Rajasekhar
- 340 **Relationship Between Services Trade, Economic Growth and External Stabilisation in India: An Empirical Investigation**  
Mini Thomas P
- 341 **Locating the Historical Past of the Women Tea Workers of North Bengal**  
Priyanka Dutta
- 342 **Korean Media Consumption in Manipur: A Catalyst of Acculturation to Korean Culture**  
Marchang Reimeingam
- 343 **Socio-Economic Determinants of Educated Unemployment in India**  
Indrajit Bairagya
- 344 **Tax Contribution of Service Sector: An Empirical Study of Service Taxation in India**  
Mini Thomas P
- 345 **Effect of Rural Infrastructure on Agricultural Development: District-Level Analysis in Karnataka**  
Soumya Manjunath and Elumalai Kannan
- 346 **Moreh-Namphalong Border Trade**  
Marchang Reimeingam
- 347 **Emerging Trends and Patterns of India's Agricultural Workforce: Evidence from the Census**  
S Subramanian
- 348 **Estimation of the Key Economic Determinants of Services Trade: Evidence from India**  
Mini Thomas P
- 349 **Employment-Export Elasticities for the Indian Textile Industry**  
Tarun Arora
- 350 **Caste and Care: Is Indian Healthcare Delivery System Favourable for Dalits?**  
Sobin George
- 351 **Food Security in Karnataka: Paradoxes of Performance**  
Stacey May Comber, Marc-Andre Gauthier, Malini L Tantri, Zahabia Jivaji and Miral Kalyani
- 352 **Land and Water Use Interactions: Emerging Trends and Impact on Land-use Changes in the Tungabhadra and Tagus River Basins**  
Per Stalnacke, Begueria Santiago, Manasi S, K V Raju, Nagothu Udaya Sekhar, Maria Manuela Portela, António Betaâmio de Almeida, Marta Machado, Lana-Renault, Noemí, Vicente-Serrano and Sergio

Price: ₹ 30.00

ISBN 978-81-7791-209-8



## INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE

Dr V K R V Rao Road, Nagarabhavi P.O., Bangalore - 560 072, India  
Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008  
E-mail: vani@isec.ac.in; Web: www.isec.ac.in