Benefits of Cycling in India: An Economic, Environmental, and Social Assessment

Study supported by All India Cycle Manufacturers’ Association (AICMA)

January 11, 2019
Report launch event, India Habitat Centre, New Delhi
Increasing Private Vehicle Ownership

- Two-wheeler and car ownership increased at a CAGR of 10.1% between 2006 and 2016.
- Two-wheelers account for 73.5% of the total registered vehicles fleet in the country.
- Share of households owning cycle increased from 44% to only 45%.

Between 2001-2011, household bicycle ownership increased at an annual average rate of 3% while ownership of two-wheelers and cars increased at a much higher rate.
Importance of Cycling for India

A sustainable mode of transport with zero emissions: **Need of the hour**

Can solve the problem of **congestion** and increasing energy consumption

An active mode of transport that promotes **healthy lifestyle**

Mode that provides **accessibility** and supports livelihood

Promotes **gender empowerment**

Addresses the issue of low female **school enrolment**
# Economising the Benefits: International Cases

## Bicycle Industry, EU-27 (2016)
- Increased sales of bicycles and cycling equipment can boost the growth of other related industries
- A doubling of bicycling mode share from 7.6% to 15.3% increased the retail turnover in EU-27 by more than €27 billion

## World Bicycle Relief (WBR) - Accessibility Improvements
- WBR, argues that the provision of bicycles increases student attendance and academic performance by 28% and 59%, respectively.
- It also increases the patient visits of healthcare workers by 45% and provides a safer mode of transport for women

## Cycle to Work Scheme, UK
- Started in 1999, the scheme has attracted 1 million workers till now
- Average work trip of 7 km
- Tax exemption benefits to employers to loan bicycles and safety equipment
- Annual CO2 emission reduction of 0.13 MT ~ average annual CO2 emissions of 24,000 households in the UK

## Portland, Oregon, USA (2011) Fuel Savings
- Three cycling mode share targets: 15%, 20%, 25%
- Four-wheeler trips < 3 miles
- Fuel Savings: $143, $180, $218 million by 2040

## Netherlands (2013) Health Benefits
- 74 minutes of cycling per week can prevent 6,500 premature deaths
- Annual Savings of €19 billion with an investment of only €0.5 billion
- Benefits equivalent to 3% of country’s GDP
Analysis of Work Trips in India

• Analysis is based on 2011 census data on “Other Workers by Distance from Residence to Place of Work and Mode of Travel To Place of Work”

• The workforce data is projected for the year 2015-16 in order to obtain more recent estimates

![Bar chart showing share of work trips by mode in urban and rural India (2016)](source: TERI Analysis)

Figure: Share of Work Trips by Mode in Urban and Rural India (2016)
Estimation of Benefits

Benefits of cycling

Direct benefits
- Improved health
- Personal fuel savings
- Travel-time savings

Indirect benefits
- Emission reduction
- Energy security
- Reduced inequality

Substitution of short distance work trips presently being undertaken by two wheelers and four wheelers

Three scenarios of trip substitution: 50%, 75% & 100%
Personal Fuel Savings

• The composition and growth of India’s vehicle fleet has transformed greatly in favour of private motorized vehicles.

• Observed pace of motorization much higher in cities.

• Predominantly powered by fossil fuels, the volatile and ever-rising prices of these fuels have steadily increased the operating costs.

50% shift of short distance work trips could result in total fuel expenditure savings of INR 27 billion.
Valuation of health benefits has been done using **WHO HEAT** tool.

The tool assumes that the full benefits will be realised after a period of 5 years of continuous cycling.

Referring to the moderate scenario where individuals shift to cycling for an average distance of \( \leq 3.5 \) km for 120 days in a year, the monetised benefits of increased physical activity translates into **0.9-1.3%** of India’s GDP for 2015-16.

**Figure: Present value of accumulated health benefits by 2026 and 2031**

Source: TERI Analysis
**Health Benefits on Account of Reduced Air Pollution**

<table>
<thead>
<tr>
<th>Scenario*</th>
<th>Health Benefits from Reduction in Air Pollution (INR Billion)</th>
</tr>
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<tbody>
<tr>
<td>ALT 1</td>
<td>120</td>
</tr>
<tr>
<td>ALT 2</td>
<td>241</td>
</tr>
<tr>
<td>ALT 3</td>
<td>341</td>
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- In comparison to the BAU, a 50% increase in the bicycle PKM results in a reduction of premature deaths by 8618. This corresponds to an annual saving of INR 241 billion.

**Reduction in mortality due to reduced air pollution**

ALT 1-25% increase in bicycle PKM
ALT 2-50% increase in bicycle PKM
ALT 3-75% increase in bicycle PKM
31% and 26% of workforce undertakes an average work trip of 3.5 km and 8 km on foot.

It is estimated that the provision of bicycles to unskilled workers in India who walk to work for a distance greater than 3.5 km can result in an annual travel time savings worth INR 112 Billion.

These savings are representative of the additional output that is produced in the economy as a result of increase in man hours, which amount to 23 Million added hours.
Monetized Benefits

- Cycling to work can lead to total benefits of INR 1.8 trillion. This amounts to 1.6% of India’s GDP for the year 2015-16.

- Health Benefits account for 87% of the total monetized benefits of cycling.

- Cycling also leads to benefits in terms of infrastructure savings, congestion reduction, road safety. However, these benefits have not been valued due to data unavailability.
In 2015-16, more than 50 million daily work trips up to an average distance of 8 km were undertaken by two-wheelers and cars.

As per the estimation, these trips accounted for 800 million litres of petrol consumption.

75% of petrol being consumed by two-wheelers.

Among private vehicles two-wheelers account for the highest share in total CO₂ emissions.

Energy Savings of 0.35 MTOE and 1 million tonnes of CO₂ emission reduction.
Improving Bicycle Ownership among Low Income Households

1. Bicycle is an invaluable asset used for multifarious income generating activities

2. Cost-effective form of mobility

3. Positively impact the socio-economic condition of women

*Bicycle ownership still remains low in this segment, primary reasons being:*

- High price of Bicycles
- Lack of financing options

There is a need for making bicycles affordable by:

- Reducing the GST on bicycles costing less than INR 5000 along with input tax credit
- Provision of micro-credit loans: Bicycles should be brought under priority-lending guidelines of RBI
Promoting Cycling among Choice Users

- Increasing investment on cycling infrastructure

- Mandating investment on NMT for projects that seek to develop motorized and public transport infrastructure

- City-wide bicycle sharing schemes should be planned and supplemented with awareness campaigns

- Aforementioned measures should be supplemented by regulations on the use of private motorized vehicles:
  - Congestion tax
  - Parking pricing
  - Pollution tax
Several state governments have initiated the bicycle distribution scheme in India

- Mukhyamantri Cycle Yojana introduced by Bihar govt has resulted in a 5% increase in the enrolment rate of girls in secondary school and a 25% reduction in the gender gap in enrolment.

- 3,423,004 cycles were distributed as a part of Sabooj Sathi scheme in West Bengal to the students of classes X and XII in order to increase access to higher secondary schools.
Initiatives by Government

What more can be done?

- **Development of Platform**
  To make cycling industry more globally competitive, initiatives should be taken to promote technology upgradation and indigenous production of advanced raw materials.

- **Mass Awareness Campaigns along with Cycle Sharing Schemes**
  The focus of the campaigns should be to highlight the economic, social, health, and environmental benefits of cycling and to change the perception of the bicycle as the poor person’s mode of mobility and an unsafe mode of transport.
Thank You