

Chapter V

Presentation

Slide No. 1

Issue

AIR POLLUTION IN KATHMANDU

A Serious Problem of Health Damage

Slide No.2

Definition of key Word

Air Pollution: the presence in the air of substances in concentration sufficient to interfere with health , comfort, safety, or the full use and enjoyment of property
(*Moeller,1992*)

Particulate matter: an air suspended mixture of solid and liquid particles that vary in size , composition, origin and effects (*Dockery and Pope III,1994*)

- particles of 10 microns or less in size are referred as "PM10"

TSP : Total suspended Particles in air

Slide No.3

What are the problems**Particulate Pollution**

- 45 % of population exposed to PM₁₀ above WHO guidelines

Sulfur dioxide and Nitrogen oxide

- No problem

Larssen et al.96

Lead Pollution

- Lead dust concentration higher than WHO set norms/*Ness95*
- Lead content of air in city ranges from 0.5ug to 1.1ug

Slide No.4

Consequences of Particulate PollutionMortality/year

- 85 more related premature deaths

Morbidity/year

- 506 Chronic Bronchitis case, 4,847 Bronchitis case in children
- 18,863 Asthma case
- 1, 945 Emergency room visits

Monetary Loss/year

- US\$ 4million / year

Larssen et al.96

Slide No.5

Consequences of Lead Pollution

- No conclusive study
- Estimated blood lead level of population:15 to 19 ug/dl
- Consequences of above mentioned blood lead level:

Loss of IQ, hearing loss and

Vitamin-D deficiency in children

Hypertension in adults

Slide No.6

Why Particulate Pollution is Problem

- With 4 million\$, Treatment for 100% of Cataract Blind
- i.e about 65% of total blind Nepali get treatment

Lead Pollution problem or not ?

- No conclusive report to show Consequences
- Even lead is problem, its solution (unleaded gasoline) has been now placed

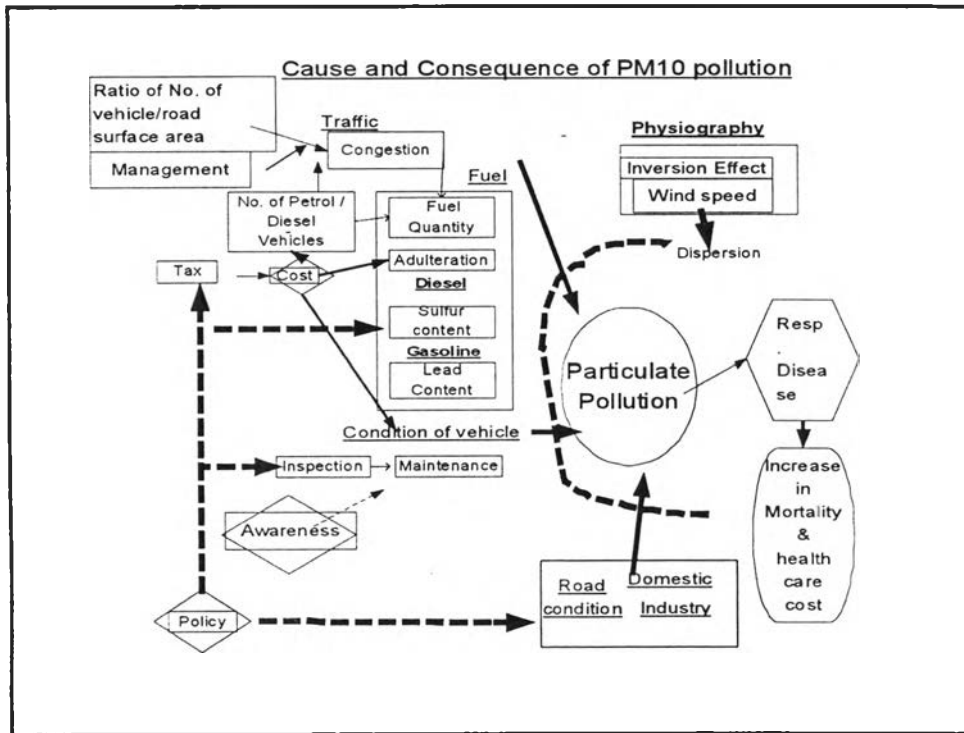
Conclusion: **Particulate Pollution is No.1 problem**

Slide No.7

Main sources of Particulate Pollution

	PM ₁₀ %
Brick Industry	28
Domestic fuel con.	25
Himal cement	17
Vehicle Exhaust	12
Resuspension	9

Larssen et. al/96



Slide No.8

Slide No.9

Where we should intervene and why

<u>↓ in emission of 1kg</u>	<u>↓ in Health damage cost (Rs)</u>
•Traffic (Exhaust)	341
• Resuspension	122
• Domestic	185
•Brick kiln	62

Larssen et al/96

Conclusion: Target to reduce traffic Exhaust

Where we should intervene and why

↑ in emission of 1kg	↑ in Health damage cost (Rs)
•Traffic (Exhaust)	576
• Resuspension	571
• Domestic	270
•Brick kiln	253

Larssen et al/96

Conclusion: Target to reduce traffic Exhaust

Slide No.10

Slide No. 11

What are the solutions to control Pollution

•**Regulatory Approach**

- Most essential but its not enough
- Failure in developing countries

•**Market Based Approach**

- New for developing countries,
- Designing , enforcing are main problems

Tietenberg 1995

What are the solutions to control Pollution
(Contd.)

Information Approaches

- Information as a vehicle for making community active in regulatory process
 - Falling cost of information collection, aggregation and dissemination
 - Rising demand for environmental information in community , Market
- Tietenberg 1995*

Conclusion: **Information Approach** effective among all

Slide No.12

Slide No.13

A RADIO PROGRAM TO REDUCE THE OF AIR
POLLUTION IN KATHMANDU VALLEY : A HEALTH
PROMOTION STRATEGY TARGETING TO TAXI
OWNERS AND TAXI DRIVERS

Slide No.14

Proposal Outline

Aim
To reduce adverse health affects of air pollution

General objectives
To reduce vehicular emission

Specific Objectives

- To increase knowledge of air pollution and the adverse health affects*
- To increase knowledge about how maintenance of a vehicle can reduce the air pollution*
- To increase practice of maintenance of vehicle to reduce the vehicular emission*

Slide No.15

Outcome Measurement

- Knowledge about adverse health affects & pollution*
- Knowledge and practices of taxi driver and owner about maintenance the vehicle*
- Proportion of vehicle that passed emission test before and after the projects*

Data collection Technique

- Questionnaire Survey,
- Focus Group discussion
- And In-Depth Interview

Slide No.16

Operational Definition**Community of Taxi drivers**

All taxi drivers who have been driving taxi in Kathmandu as a major profession from last 1 year and will continue to do so for next 1 year

Community of Taxi owners

All the persons who have taxi/s registration in their name in Kathmandu and continue to possess taxi for at least next 1 year

Slide No.17

Operational Definition

(Contd.)

Maintenance

Proper adjustment of those parts involved in ignition and combustion of fuel in Vehicle eg. Air filter, fuel filter, tappet settings and carburetor in petrol vehicle within the interval as recommended by owner's manual .

Slide No.18

Why vehicle maintenance for pollution control**Traffic management**

- Traffic control through One-way street, traffic light are not solving the problem
- Construction of New road expensive
- **Improving fuel quality**
- Depends on external agents i.e.India

Vehicle maintenance

- Feasible & can reduce tail pipe emission by 35%
Larssen et al

Conclusion Vehicle maintenance is feasible, cost effective

Slide No.19

Why radio not other medium?

- Radio reaches a wide audience than any other medium
- Radio are cheap, portable and convenient to listen
- can reach people who are isolated by illiteracy
- Community based radio station is available
- suited to taxi drivers as they regularly listen on their work

Disadvantage

- Transitory medium i. e. not like reading ,one read until s/he understands

Slide No. 20

Evidences for radio :as a tool to change KP

- People adopted habit of filtering water learned from radio as a result cases of Guinea infestation drop by six folds

Adam and Harford,98

- Radio program increased Knowledge and skill of Health workers in Nepal

Karmachrya,97

Slide No.21

Why taxi drivers and taxi owners as target population

- Top four PM₁₀ Polluters:Truck, Motorcycle, Taxi and tempo, Three wheeler diesel Vehicle
- Other major polluters: two stroke motor cycle banned from registration (*TKP, Sep 19,99*),
- Heavy Vehicle: trucks restricted to enter during daytime
- Three wheeler diesel vehicle completely banned
- Taxis and tempos are one of major polluter

Slide No.22

Need for informing the taxi drivers

A Study revealed a lack of awareness of the adverse environmental and economic effect of poor maintenance in Kathmandu

Justification

- 10 % decrease in vehicle emission will reduce
 - 6% Mortality
 - and decrease in 1 kg emission will save 6.82 USD

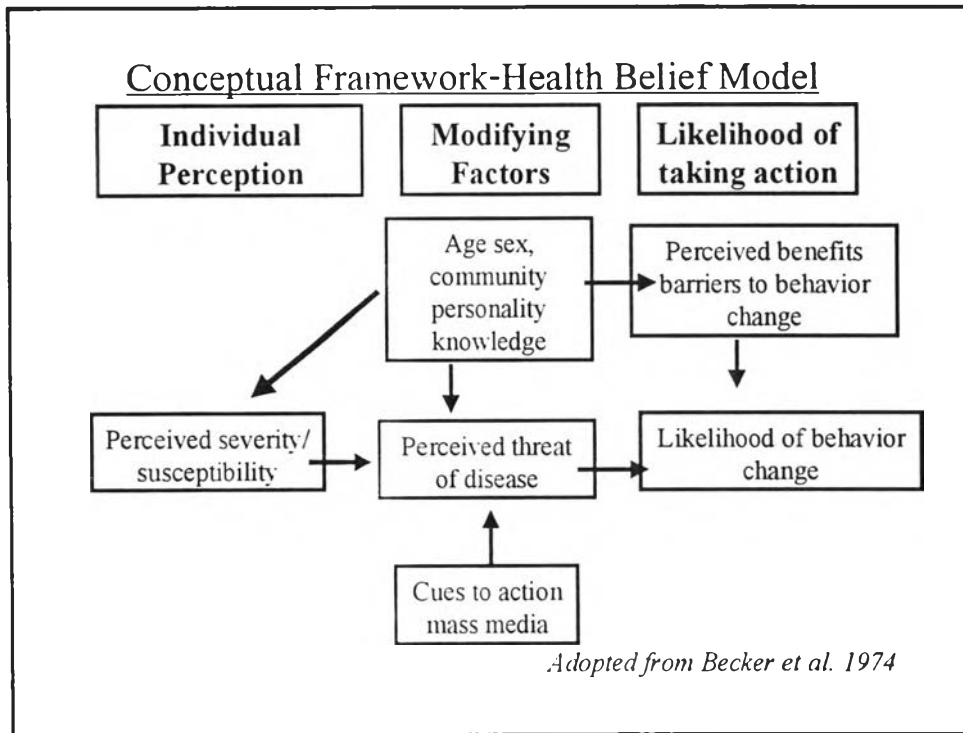
Larssen et al.96

Slide No.23

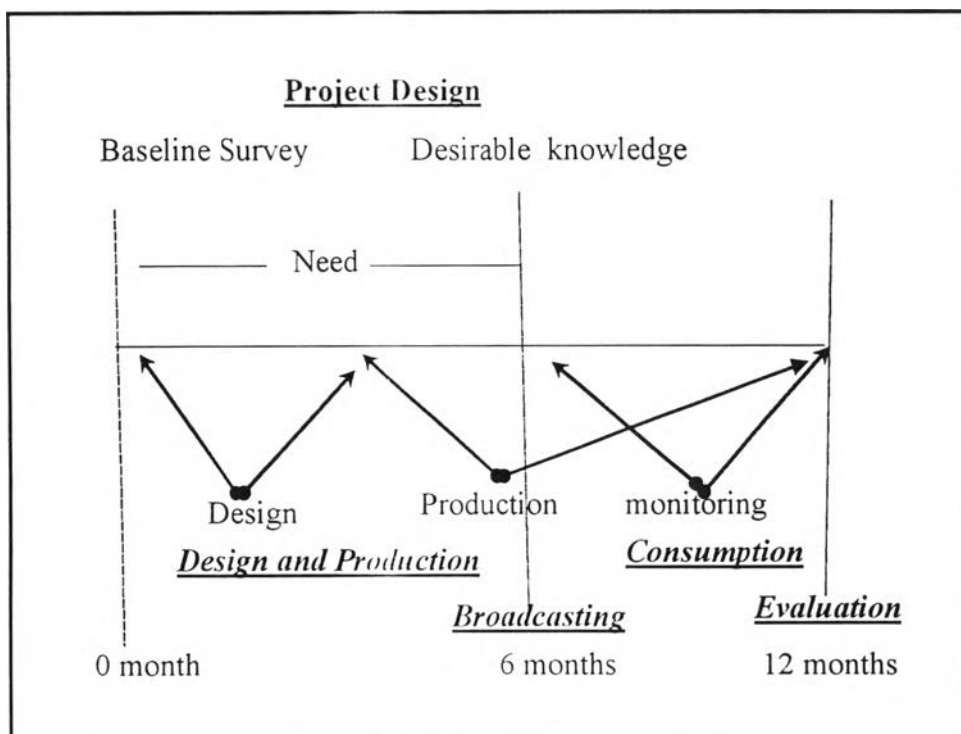
Why should they change behaviors ?

- Radical improvement in fuel efficiency
- 35% reduction in emissions of PM₁₀, CO & VOC
- Cost of maintenance is offset by reduction offuel cost
Larssen et al
- Better safety, performance of vehicle & long lasting (*EPA*)
- Reduction of emissions make easy to comply with prescribed std.
- Compliance means no restricted area, i.e business incentive

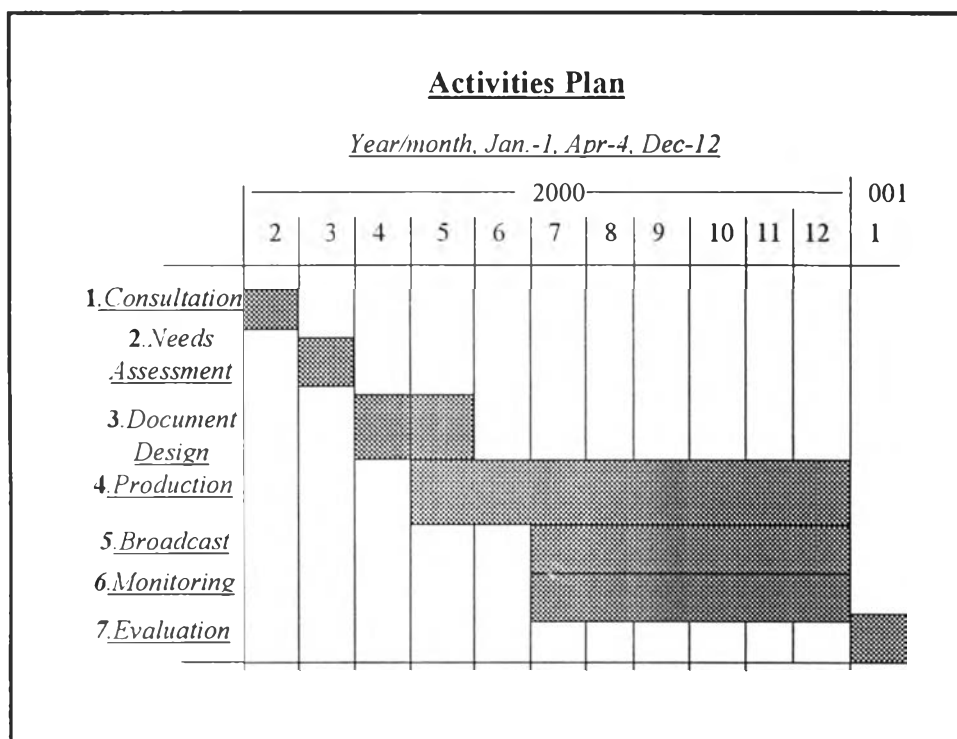
Slide No.24



Slide No.25



Slide No 26



Slide No.27

Budget

Air time cost	Rs. 78,000
Personnel	Rs. 300,000
Overhead supplies	Rs. 26,000
Publicity/communication	Rs. 26,000
Contingency	<u>Rs. 80,600</u>
Total	Rs. 510,600
	US\$ 7,400
(NRs. 69=1US\$)	

Slide No.28

-----Data Exercise-----**Objectives of the Data Exercise:**

1. To test and refine the data collection instruments.
2. To develop the practical knowledge and skills of data collection techniques.

Place of data Exercise: Phahurat

Study Population: Vehicle Owners /drivers

Slide No.29

Lesson Learned & Limitations

- In-depth Interview & FGD effective to explore various issues involved in KP
- Participants should be homogeneous
- Urban Participants have time limitation
- Lack of rapport