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Vehicular Traffic and Environmental Pollution in Garo Hills: A Case Study of Garo Hills Autonomous District Council (GHADC), India

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Abstract

Meghalaya is abundant in natural beauty, with a population of 29.64 lakh and a literacy rate of 75.48. Although 90% of the populations are aware of the pollution only 25% of the indigenous people who are connected with education and related to vehicles had taken steps to protect the environment. The people of Garo Hills are close to nature and yet far from it in modern understanding, especially to pollution and is vulnerable to destruction by the ill effects of smoke and toxic gas pollution of vehicles.

Keywords: Pollution, Garo Hills.

Introduction

The problem of pollution begins with urbanization. Most of the common air pollutant in the urban environment like the cities of Garo Hills, Meghalaya[1] includes vehicular and industrial exhaust that contains potentially lethal chemical compounds such as oxides of carbon, nitrogen, sulphur, ozone, lead, suspended particulate matter and unburnt hydrocarbons[2]. The movement to address this problem began in cities like Los Angeles (USA) and Tokyo (Japan). Incomplete combustion is the main cause of most pollutants. The urban air pollution has three primary sources: industrial pollution, domestic pollution and Vehicle pollution. Unburnt hydrocarbons, carbon monoxides and lead etc are mainly emitted from incomplete combustion of petrol while nitrogen oxides and significant quantities of suspended particulate matter are from diesel. Although it is considered that motor vehicles are the primary source of urban air pollution[3] in developed countries but the case is different in developing countries. In developing countries the air pollution problems are mainly due to industries[4], domestic and vehicular sources. Moreover, diesel, one of the major products of crude oil constitutes a major source of pollution of air, water and soil[5,6]. In 1989, the Government notified emission control standards for two to four wheelers. The landmark legislation that was passed by the Government of India in this respect was the Air Pollution Act (1991) for regulating and monitoring industrial and vehicular pollution across the country. However, vehicular pollution still remains out of control.

The aim of this study is to find out the consciousness of the people of Garo Hills in relation to pollution, especially to vehicular pollution. As Garo Hills is abundant in natural beauties and forests it is vulnerable to destruction by the ill effects of smoke and toxic gas pollution of vehicles. Further, this study will also pave the way for studies to be taken up in relation to pollution in other specific fields as water related pollutions and garbage wastes disposal in future.

Material and Methods

To understand the problems, address a relatively permanent solution to such problems, and explore the prospect and the means to such possibilities of integrating the people of Garo Hills in pollution control through ecological practices, the researcher has set before him a set of such questions to investigate. The questions to be investigated, also referred to as Research Questions, are as follows: i. When was Pollution related knowledge in GHADC surfaced?, ii. How are vehicles in GHADC operating?, iii. How are people responding towards vehicular pollution along with ecological awareness? iv. What is the nature of the vehicular pollution deterrent being practiced over the years in GHADC? v. Where are the people of GHADC standing with reference to pollution deterring attainments when compared to their counterparts in rest of India?

Objectives	Data gathering tools and techniques	Nature of tools and techniques	Sources of data and their number	Nature of data
To study the sequential development of education of the indigenous people	Questionnaire and Documentary Survey	Self developed	Documentary	Quantitative
To evaluate the facilities available in vehicular deterrent	Documentary	-	Documentary	Quantitative
To asses and compare the attainments of the Garos in Meghalaya, in pollution related knowledge	Documentary	-	Documentary	Qualitative
To asses and compare the attainments of the Garos in Meghalaya, in pollution related knowledge	Scientific	EPA	Analytical	Qualitative

The study is based on the interpretation and narration of events and on Official documents/materials. Scientific analysis of the air quality in Garo Hills was done in collaboration with Meghalaya State Pollution Control Board, Shillong. Sample collection was carried out in Public Health Engineering (PHE) Department at Araimile, Tura.

Results and Discussion

On the topic of general awareness of pollution, 90% of the indigenous people know that what pollution is and are aware. They know that how pollution is caused and from where, which is a direct threat to the environment and ultimately making this earth a difficult place to live in. On the other hand, 10% of the indigenous people have special knowledge about vehicle related problems such as changing of air filter, mobil filter frequently thereby avoiding excess emissions of carbon dioxide from the vehicles. But 80% of the indigenous people do not have the detail knowledge of pollution though they drive a vehicle. They do not know that if the air filter, mobil filter are left unchanged for a long time, it will emit excess carbon in the air. About 10% of the indigenous people did not even hear that vehicles causes pollution as because they are out of reach of owing any vehicles. Regarding pollution of petrol run vehicles, 65% of the indigenous people know that petrol run vehicles causes pollution while 80% of the indigenous people thinks that diesel vehicles produces more pollution as because it produces black smoke (Carbon) which is seen, despite of the fact that the smoke coming out from the petrol vehicles (Carbon monoxide or white air) is not identifiable and causes more pollution than diesel vehicles. On the other hand, 50% of the indigenous people knows that vehicles are run by solar or battery and are used instead of fossil fuel run vehicles while other 50% are either confused or do not even know that now vehicles are run by solar power and battery. In Autonomous District Council the literacy[7] percent is about 51% but multiplication in the number of vehicles on the road is posing a threat for pedestrians resulting difficulty in their movement and causing rapid inhalation of polluted gases coming out of the exhaust of vehicles. Almost about 92% of the indigenous people agree that environmental pollution causes skin diseases, illness, and increment in atmospheric temperature. Effects of pollution on crops are known by 33% of the indigenous people because they have an idea about agriculture and are educated in various lines. However, 67% of the indigenous people are unaware of it because they are not agriculturists and have no scientific knowledge of crops. So, the Government should train the employees of agriculture department so that they can spread awareness how crops are affected by pollution. A subject can also be introduced in schools practically so that necessary steps can be taken by all from the base.

After knowing the importance of environment only 75% of the indigenous people did not take any steps to protect the environment either because they are lazy or they are unaware of the future consequences. So, the Government and N.G.O's should take up necessary steps for saving the environment in the area. It can be saving of trees, planting trees, provide alternatives to shifting cultivation and also introduce courses about the environment that is affecting us. The Government shall also introduce proper checking and steps to control the effects on the environment from vehicles due to excess emissions of oxides of carbon, nitrogen and sulphur that will save the environment[8] table-1 and 2.

The Eco-Test[9] results provide meaningful information to consumers shown by the reactions and questions for further measurements. The results are also an important input for the political discussion, recently the workshop "Car Emissions and Euro 5" in Brussels organized by the ADAC on behalf of the FIA. For example diesel vehicles without particulate filter are in their involvement in the quality of the discussion about the ambient air in cities (fine particulate PM10. The development of car technology is shown by the results of latest Diesel emission measurement (particulate filter), by the results of Hybrid vehicles and by the results of natural gas vehicles. Now it is more important to compare the emissions of all types of vehicles. The average of the Petrol vehicles has lower emissions than the Diesel. The results of Eco-Test done by FIA foundation for automobile and society on pollution rating show that in general Petrol vehicles are still better than Diesel vehicles[10] table-3.

The leading National daily The Hindu reported on 30 April 2011 that in the urban areas, carbon emission by various sectors differs. The report cites Intergovernmental Panel on Climate Change data to say that 14 per cent of greenhouse gas emissions are accounted for by agricultural activities. Transportation accounts for 23 per cent of the energy-related greenhouse gas emissions.

Scientific Analysis of Air sample in Garo Hills: Samples were collected in the office of the Chief Engineer, PHE at Araimile and it was analyzed and the interpreted in tabular form for Sulpher-dioxide, oxides of Nitrogen and particulate matters for six months i.e. July 2010 to December 2010. The results are given in concentrations micrograms per meter cube, the annual averages of the concentrations were calculated and comparative studies were made with permissible limits table-4.

The result of the study shows that during winter especially in the month of November and December the concentration of Sulpher-dioxide, oxides of Nitrogen and particulate matters are considerably high, much higher than annual average. The alarming fact is concentration of Sulpher-dioxide, oxides of Nitrogen is higher than Permissible Limits (Annual Average)

Conclusion

A perusal of the preceding chapters bring to light that in GHADC, indigenous people has literacy rate little over National Level. Still pollution level is going up regularly which may be

attributed to the poor economy of the indigenous people and mode of cultivation specially shifting cultivation. The increment and multiplication of the number of vehicle day by day is the major cause of pollution in Garo Hills. The rapid increase in the number of auto -rickshaw is worsening the situation which releases major toxic pollutant, unburnt hydrocarbons in the sky of Garo Hills. The professional drivers in commercial vehicles have little knowledge about pollution; the poor maintenance of the vehicle further worsens the problem. Due to hilly terrain and lack of footpath for pedestrians compels people to move in auto rickshaw otherwise at least number of these devil taxi could have been checked.

Table-1
The average level of consciousness of the indigenous people of the interviewed 100 samples, (Question Wise)

General Awareness			Vehicular related Knowledge			Petrol vehicle related Knowledge			Diesel vehicle related Knowledge			Solar Powered vehicle related knowledge			Effects of vehicle pollution on Human			Effects of vehicle pollution on Crops		
Yes	No	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
98	**01**	**-**	**44**	**22**	**33**	**60**	**24**	**15**	**82**	**07**	**10**	**69**	**08**	**22**	**92**	**04**	**03**	**62**	**09**	**28**

Table-2
The average level of consciousness of the indigenous people of the interviewed 120 samples, (Category Wise)

Teachers			Officers			Students			Businessman			Drivers			Housewives		
Yes	No	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
97	**16**	**13**	**100**	**08**	**18**	**79**	**16**	**10**	**71**	**13**	**21**	**94**	**16**	**16**	**66**	**06**	**33**

Table-3
The number of vehicles plying in West Garo Hills District (In last 6 years Selection) Number of Vehicle Registered

Year	Truck	Bus	Car		Auto rickshaw	
			Petrol	Diesel	Petrol	Diesel
2005	4	37	206	19	201	99
2006	13	28	138	15	83	144
2007	11	15	177	20	71	235
2008	7	12	141	20	44	98
2009	9	5	187	27	72	202
2010	5	Nil	399	22	146	300

Source: District transport officer, Tura, West Garo Hills, Meghalaya.

Table-4
Ambient Air quality Data analysis conducted at the Office of Additional Chief Engineer PHE, Araimile, Tura, West Garo Hills District

Month and Year	Concentrations of Pollutants			Permissible Limits (Annual Average)	
	PM10 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	Pollutants	Concentrations ($\mu g/m^3$)
July 2010	47.5	2.0	6.9	PM10	60
August 2010	60.6	2.0	8.8	SO_2	50
September 2010	67.0	2.0	9.3	NOx	40
October 2010	57.1	2.0	7.2	Permissible Limits of Ambient Air quality Standards as per EPA Notifications GSR 826(E), dated 16th Nov. 2009	
November 2010	63.8	2.0	8.0		
December 2010	72.7	2.0	10.2		
Annual Average	60.4	2.0	7.7		

Source: Meghalaya State Pollution Control Board, Shillong

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