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**IMPACT OF KYOTO PROTOCOL ON DEVELOPING COUNTRIES @ CARBON CREDIT ACCOUNTING:**

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**ABSTRACT:**

The ongoing article highlights about the impact of Kyoto Protocol on developing countries; where extensive focus are on lowering the emissions of greenhouse gases in the atmosphere. By doing this kind of process it would foster for developing countries to excel and propel in many ways like increase in cash flow for selling carbon credits, use of alternative fuels and technology. For the collection of data initially 18 variables were identified. The researchers have conducted a pilot study with the help of 31 respondents where, the variables are tested using Cronbach Alpha and Factor analysis. Principal Component Analysis has been applied and this method helps us to retain 13 variables out of the total 18 variables identified initially. Increase in cash flow for the sale of carbon credits and incentives, subsidies being received by the respective state government for maintaining a neat clean, pollution free environment stands toll among the ranks given by male, female employees from industrial belt regions of Odisha.

**KEYWORDS:** Kyoto Protocol, greenhouse, emission trading

**OVERVIEW:**

The main objective of this protocol was to reduce the concentration of greenhouse gases in the atmosphere. Reducing the greenhouse gas concentration will stop the dangerous impacts of climate change and hence protect the environment from the hazardous effects of pollution. Annex I parties who have ratified the protocol are committed to reduce the concentration of greenhouse gases in their respective countries by absorbing these gases through Joint Implementation, Clean Development Mechanism and emissions trading. The Annex I parties can also reduce GHG emissions in developing countries by generating a pool of adaptation fund for climate change. The protocol has assigned compulsive targets for carbon footprint reduction on major developed countries and they have accepted it. On 26 August 2002 India acceded to the Kyoto Protocol. Lot of initiatives has been taken in India to reduce GHG emissions and carbon footprints. **(Blackman & Harrington, 1999)**

The context itself is very much dubious in nature. Developing countries never pin-point out the fallacies of their economic development or otherwise make way for the payment of economic cost which has been a menace built by the industrialization process. A quite obvious it is 90% of the emissions of greenhouse gases originated from developed countries. On the other side developed countries refuse to counter the problems as it tells the developing countries to lay a hand in hand to solve the issues. The triumvirate underlying principles in making such goals are trade, productivity and shelter against reckless severity. A nod to such type of agreement will bring about reformatinal changes, development, and cost-optimization lead to reduced capital investments in reaching emission targets for developing countries. **(Convery, 2003)**

This includes understanding climate change, knowing the cause of emissions and using improved technologies to reduce the impact of emissions. There are a number of Governmental and Independent agencies actively undergoing research on climate change in India. The emergence of emissions trading has made carbon credits a growing area to reduce the GHG emissions. The developed countries to lessen the tax will purchase the credits, which are rewarded to developing countries for controlling these emissions. An active emissions trading market will reduce the concentration of greenhouse gases in the process of further industrialization. Coal has always been the most sought after fossil fuel for power generation, manufacturing and industrialization. The use of renewable replacing coal is still a question of various factors to be feasible. To reduce the carbon footprint, carbon consumption has to be reduced and how far India can succeed by using the alternative sources of fuel is only a matter of time and efforts to say. **(Frankel, 2004)**

Year 1997 was a dramatic one when Kyoto Protocol was bargained as the first instant of climate change. Transmission of greenhouse gases was on the agenda from 2008-12. The evolvement of Kyoto Protocol has got both ups and downs at the same time where United States refused to ratify the treaty leaving behind only a meager concern about emission aim after 2012. Trading emissions and other flexibility mechanism are fundamental brainchild of Kyoto Protocol. **(Philbert, 2001)**

Carbon footprint scientifically is defined to be a complete package of greenhouse gases emission, which has been created by an external agent like individual, organization. The extenuation of carbon footprints through the development of alternative projects such as solar, wind energy and reforestation-signaling a way to reduce carbon footprint; which is quite often carbon offset printing. Number of techniques is there to reduce the carbon off prints; thereby redesigning the process associated with the developing countries. 4R – like Reduce, Reuse, Recycle and Refuse. Recycling or re-engineering is used by manufacturing industries like electricity generated from solid waste particles and human excreta known as pyrolysis. Daily use of biodegradable items like paper baskets instead of plastics give us less

production of carbon footprints. Driving less as petrol and diesel engines emit a lot of carbon footprints. Use less air conditioning and heating. Incentives and subsidies would be more received by the respective government for preserving a neat and clean developing country like India. The surplus fund built over time due to transaction can be used for updated technology equipment and methods for renewable reducing carbon footprints in the long run for the developing countries. **(De Moor, 2011)**

Technology is the instrument which every developing country utilizes it to the fullest of extent i.e. CDM. Impact of CDM and using other hi-open ended technologies is huge as it paves the way for more selling options. More investment, efficient and little risk of negative economic effects frequently drew CDM to be associated with developing countries. When alternative technologies are used; it would create a number of jobs and development of skills would be an easygoing routine task. A nullifying technology, transfer part which shows likeliness towards multidimensional projects expected from developing countries. Number of options almost iscounted for the role of forestry in CDM, where deforestation was always avoided. **(Jacoby, 2000)**

Energy is essential and required at most all levels of developing countries. More deep concern is alternative energy, which is derived from various other different sources of energy apart from main source of energy. Fossil fuel, coal, oil and natural gas are the main three types of fundamental energy required for our daily activities of human beings. Fossil fuel pledge continues to invite troubles. Burning these would allow a number of greenhouse gases like carbon dioxide released leading to global warming. Its effect are catastrophic in nature like smog, airpollution, derogating human health, rising sea water levels, etc. Investments in alternative fuels and bio-degradable, renewable will preserve costly fossil fuel and thus save from emission of gases; can be used at times of emergency required by developing countries. **(Mullins, 2013)**

#### **SIGNIFICANCE:**

This study is categorically conducted henceforth to show the significance or the impact of Kyoto Protocol on developing countries and thereby lowering the emissions of greenhouse gases content in the atmosphere. Lowering the emissions of greenhouse gases content will freeze the rapid climate change formation and shield the environment from the dreadful effects of pollution.

#### **OBJECTIVES:**

1. To study the impact of Kyoto Protocol on developing countries.
2. To suggest measures based on the findings

#### **SCOPE OF THE STUDY:**

The study caters to in and around the region of Odisha (Belpahar, Angul, Choudwar & Kalinganagar), which consists of selected industrial belt employees consisting of both genders. For the sake of confidentiality the names of their working organizations have not been revealed.

#### **METHODOLOGY:**

The research methodology plays an important role to draw meaningful inference in the area of the research. Categorically this study is based on primary as well as secondary data, so we have chosen Descriptive research. Data basically is collected from different selected industrial belt regions of Odisha (Belpahar, Angul, Choudwar & Kalinganagar)

For the collection of data initially 18 variables were identified. The researchers have conducted a pilot study with the help of 31 respondents where, the variables are tested using Cronbach Alpha and Factor analysis. The purpose of using Cronbach alpha value is to see internal consistency among the variables. The normal thumb rule is that, if the alpha value is more than 0.70, then the variables can be accepted in the final research. The result of the alpha value is shown in the table 1.

**Table 1. Cronbach Alpha Value**

**Reliability Statistics**

Cronbach's Alpha	N of Items
0.699	13

**Pilot Study**

A relatively high alpha value indicates that the variables are internally consistent. But alpha value alone does not give a meaningful result regarding choice of variables; as the suitability of the variables in the study region is also important. For this purpose, factor analysis has been conducted. Factor analysis is a data reduction technique which keeps only those variables that are relevant for the study area and the same has been conducted based on the response provided by the respondents surveyed during pilot study. But, to conduct a factor analysis both KMO & Bartlett's test needs to be conducted. Here also the condition is that if the KMO value is more than 0.70 and Bartlett's test of sphericity is significant, then the factor analysis can be conducted. The result of the same is shown in the table below:

**Table 2: KMO & Bartlett's Test Result**

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.824
	Approx. Chi-Square	726.700
Bartlett's Test of Sphericity	Df	171
	Sig.	.000

**Source: Pilot Study**

As both the conditions are satisfied it can be assumed that the factor analysis can be conducted. So, the Principal Component Analysis has been applied and this method helps us to retain 13 variables out of the total 18 variables identified initially.

Sampling technique is another important area, which helps to identify proper target respondents. In the present case it has been decided to go for snowball sampling technique.

The structured questionnaires were set according to the need for the proposed study and questions which were of not to use for the study were eliminated. Total 221 questionnaires were distributed and

117 were received in correct form. These questionnaires are included in the final study. Overall, the percentage of response was 53%.

#### **FINDINGS:**

There were number of findings pertain to this study. They are as follows:

1. Answering to the question which is -Lesser or no cost of technology will be involved and it will lead to reduced capital investment in reaching the emission targets for developing countries, male employees from industrial sector gave this as 9<sup>th</sup> rank and female employees from industrial sector gave it as 4<sup>th</sup> rank.
2. In the context of surplus fund built over time due to transaction can be used for updated technology equipment and methods for renewable reducing carbon footprints in the long run for the developing countries, male employees from industrial region sector gave 4<sup>th</sup> rank where as female sector gave it 10<sup>th</sup> rank.
3. Increasing the global presence and business expansion by investing suitable technology for emission reduction in developing countries where male employees from industrial belt region gave 13<sup>th</sup> rank and female employees gave 7<sup>th</sup> rank.
4. Developing country can achieve sustainable target of reducing carbon footprint by redesigning their processes and here in this case both female & male gave 2<sup>nd</sup> rank.
5. Answering to the question i.e.by using CDM and other suitable technologies the developing countries can emerge as a huge seller of carbon in emissions trading market, male sector employees gave this 5<sup>th</sup> rank & female employees gave it 11<sup>th</sup> rank.
6. The investment in alternative fuels and renewable will preserve the costly fossil fuels which can be used in time of emergency by the developing country in which male sector employees gave 7<sup>th</sup> rank & female sector employees gave this factor as 5<sup>th</sup> rank.
7. Male employees gave this as 6<sup>th</sup> rank and female employees gave this 1<sup>st</sup> rank where, incentives and subsidies will be received by developing countries from government for reducing carbon footprint in the long run will help to restructure the units.
8. The development of alternative technology will create more jobs no doubt and in this point male, female employees of industrial belt region gave 10<sup>th</sup> and 9<sup>th</sup> rank respectively.
9. Social Activity in case of male employees from industrial region belt gave 3<sup>rd</sup> rank but in case of female employees it stood at 13<sup>th</sup> rank.
10. Reducing pollution and fight against global climatic change was categorically given 12<sup>th</sup>& 3<sup>rd</sup> ranks by female, male employees of industrial belt region.
11. Factor like lowering greenhouse gases emissions would definitely give a clean image of a developing country. Here male employees gave 11<sup>th</sup> rank and female employees gave 8<sup>th</sup> rank to it.
12. Increase in cash flow for carbon credit stood tall for male employees as they gave it 1<sup>st</sup> rank and female employees gave 13<sup>th</sup> rank.
13. Overall return was ranked as 8<sup>th</sup>& 6<sup>th</sup> rank by the female, male employees from industrial belt regions.

**CONCLUSION:**

The use of Kyoto Protocol has to be rampant and fast. This would trigger and control the emission of greenhouse gases to the atmosphere. A full utilization and abiding by the principles of Kyoto Protocol will keep in check of emission greenhouse gases. Using less carbon foot prints, alternative technologies used to enhance economy thereby having increase in cash flow and increase in overall rate of return would a check on the transmission of greenhouses gases like carbon dioxide. Results from this particular study unfurl that increase in cash flow, overall rate of return which happens due to sale of carbon credits. This is achieved by adhering to the rules and regulations of the Kyoto Protocol resulting in receiving subsidies and incentives from the respective state government.

**IMPLICATIONS:**

1. There must be full implementation of Kyoto Protocol agreement in minimizing the ill-effects on developing countries which is received through trade.
2. Developed countries should lay a hand in hand for developing countries in building up infrastructure required to keep a check of concealment of greenhouse gases.

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## ANNEXURE:

## INDUSTRIAL REGION MALE SECTOR (69)

Factors	Weight (w)	5	4	3	2	1	Total	Weighted Avg	Rank
Low cost	(f)	25	19	17	7	1	69	17.8	9
	f(w)	125	76	51	14	1	267		
Global Presence	(f)	21	12	13	16	7	69	15.4	13
	f(w)	105	48	39	32	7	231		
Surplus fund	(f)	57	6	2	1	3	69	21.4	4
	f(w)	285	24	6	2	3	320		
Achieve Target	(f)	63	0	0	6	0	69	21.8	2
	f(w)	315	0	0	12	0	327		
CDM	(f)	47	13	5	2	2	69	20.53	5
	f(w)	235	52	15	4	2	308		
Investments	(f)	33	13	11	12	0	69	18.4	7
	f(w)	165	52	33	24	0	274		
Incentives & Subsidy	(f)	41	17	9	0	2	69	20.13	6
	f(w)	205	68	27	0	2	302		
Alternative Technology	(f)	21	15	10	15	8	69	15.6	10
	f(w)	105	60	30	30	8	233		
Social Activity	(f)	56	10	1	1	1	69	21.73	3
	f(w)	280	40	3	2	1	326		
Reduce Pollution	(f)	19	17	12	11	10	69	15.45	12
	f(w)	95	68	36	22	10	231		
Lowering GHG effect	(f)	20	14	11	18	6	69	15.5	11
	f(w)	100	56	33	36	6	232		
Increase Cash Flow	(f)	61	8	0	0	0	69	22.5	1
	f(w)	305	32	0	0	0	337		
Increases overall return	(f)	28	21	9	8	5	69	18.13	8
	f(w)	140	84	27	16	5	272		

**INDUSTRIAL BELT REGION FEMALE (48)**

Factors	Weight (w)	5	4	3	2	1	Total	Weighted Avg	Rank
Low cost	(f)	25	12	5	4	2	48	13.3	4
	f(w)	125	48	15	8	2	199		
Global Presence	(f)	21	12	13	1	1	48	13.1	7
	f(w)	105	48	39	2	1	195		
Surplus fund	(f)	17	13	12	3	3	48	12.13	10
	f(w)	85	52	36	6	3	182		
Achieve Target	(f)	43	0	0	5	0	48	15	2
	f(w)	215	0	0	10	0	225		
CDM	(f)	16	15	5	10	2	48	11.8	11
	f(w)	80	60	15	20	2	177		
Investments	(f)	33	3	1	7	4	48	13.21	5
	f(w)	165	12	3	14	4	198		
Incentives & Subsidy	(f)	41	2	5	0	0	48	15.2	1
	f(w)	205	8	15	0	0	228		
Alternative Technology	(f)	23	11	7	5	2	48	12.8	9
	f(w)	115	44	21	10	2	192		
Social Activity	(f)	17	10	8	9	4	48	11.4	12
	f(w)	85	40	24	18	4	171		
Reduce Pollution	(f)	19	17	12	0	0	48	13.4	3
	f(w)	95	68	36	0	0	199		
Lowering GHG effect	(f)	20	14	11	3	0	48	13	8
	f(w)	100	56	33	6	0	195		
Increase Cash Flow	(f)	13	9	7	10	9	48	10.1	13
	f(w)	65	36	21	20	9	151		
Increases overall return	(f)	28	8	5	4	3	48	13.2	6
	f(w)	140	32	15	8	3	198		