

Accounting for Carbon Credit: an effort towards green environment

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ABSTRACT

There is a budding global consensus that combating climate change is a major defy of the 21st century. Changes in the global environment are increasingly challenging businesses around the world. Companies are now expected to integrate environmental concerns into their strategic management. The emergence and popularization of the international climate change debate have created an increasingly relevant focus upon the potential of low carbon opportunities within the corporate sector. At the moment, there is a need for awareness of carbon trading since it is a key policy instrument for low carbon business growth. The objective of the paper is to discuss the basic concepts and the importance of carbon credit. It also emphasizes on the methods used to save the environment. This paper also discusses the business opportunities in the global emissions market in Indian context. Accordingly, the study analyzed the relevance of carbon credit trading in India as well as the opportunities to reduce carbon footprints, which can even help to improve the bottom line of organizations.

Keywords:- Pollution, CHGs, Carbon Credit, Carbon Dioxide, Carbon Credit Accounting, climate change

INTRODUCTION

The air and water resources we rely upon having special economic characteristics. It is useful to review those economic characteristics for insight into why we collectively tolerate environmental degradation. There is a rational explanation for the declining situation. We have taken our physical environment for granted because it has been an abundant public good. Public goods and services benefit all members of society. Since no individual owns the resource a private price cannot be determined. Decisions about public goods are therefore political since there is no private market mechanism to regulate them. Put another way, there is no obvious way to block individuals from benefiting from these goods. Another common example of a public good is national defense. All of these characteristics mean we cannot easily create a private market for a public good. Political processes are the means through which members of a society negotiate the amount and quality of a public good that will be available and how it will be paid for. Individuals that propose market solutions as the best way to respond to environmental degradation must keep in mind that our physical environment is a public good. Those that have a deep faith in private markets have to be especially careful. The current environmental situation provides a rationale for ongoing economic

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education. The environment is a political problem because the number of carbon emissions is not a private good. Controversy and conflict over how to proceed are an integral part of the political process. Those suggesting a market solution to environmental degradation is best may be revealing a lack of economic understanding. Many business leaders angst over the political attention devoted to environmental regulation. However the government is the correct place for this discourse. Accounting professionals can reduce the business angst by making statements about the environment within the paradigm of public goods. The societal risk is too high to simply wait for the environmental equivalent of a stock market crash to address the need for regulation. Forward thinking professionals cannot allow free riding citizens, companies, or countries drag us into a crisis. The “drop-in-the-bucket” mindset has to be replaced with a more enlightened position. Public action can cause the environmental costs of carbon emissions to be internalized by everyone. The free rider’s advantage has to be taken away. Accountants can help business leaders make a contribution to policy formulation by turning their energy into creating effective markets and practical disclosure requirements.

OBJECTIVES OF THE STUDY

The study was mainly aimed at measuring the level of awareness and preference towards carbon credits with special focus on the environment and carbon credit in Goa. The main objectives were:

- To assess and create awareness about carbon credit.
- To identify the factors responsible for carbon emissions and climate change.
- To study the benefits & implications of carbon credit.
- To identify & design strategies to harness carbon credit.

SCOPE OF THE STUDY

A Carbon credit is equal to one ton of carbon dioxide removed from the atmosphere.

- Exactly how much carbon dioxide is in the atmosphere now? 379 parts per million, an increase of 103 parts per million over pre-industrial times. 450 parts per million is the maximum the atmosphere can take for sustaining living.

METHODOLOGY

The article is based on exploratory study. The primary data was collected through questionnaires and discussion, interviews. The secondary data was collected from journals, books both printed and online for references.

THE IMPACTS OF CLIMATE CHANGE

Higher temperatures and more frequent droughts and floods will reduce the amount of food and other crops that farmers can produce. Storms will destroy buildings, roads, and communication systems, and make some places less accessible. Higher temperatures will allow insects that carry diseases such as malaria to spread over larger areas. Rising sea levels and more frequent severe

storms will mean some low-lying islands and coastal areas will be under water some or all of the time. Water supplies will be affected as saltwater makes its way into underground fresh water sources. This is already happening in Thailand, in various small islands in the Pacific and Indian Oceans and in the Caribbean.

Climate change affects all people and all countries, but some will be affected more than others because of where they live and how they are able to respond to climate change. Poor people in developing countries are particularly vulnerable to climate change because they mostly live in drought- and flood-prone areas of the world. People living in rural areas depend on activities such as agriculture and fishing to make a living, and these are easily disrupted by changes in the climate. Because of this, they will suffer from food shortages and general poverty. People living in urban areas often live in crowded places that have poor drainage systems and flood easily. The houses they live in can't withstand storms. Poor people often don't have adequate communication systems and therefore don't get accurate information about events such as floods and storms before they occur either.

HOW ARE WE AFFECTED?

Has there been a drought, a flood, or a typhoon in your area? Did floods and droughts occur more often than in the past? Has it been difficult to predict what the weather will be like this agricultural growing season? Have there been heat waves, and more cases of diseases such as malaria? Has the level of the sea has been increasing over time? Has underground water near the sea been increasingly salty and unsuitable for normal uses? These could all be due to Climate change. These problems will become bigger as the climate changes. If greenhouse gas emissions continue to increase, the impacts of climate change could make the earth uninhabitable in the long-term.

Because climate change is everyone's problem, and is caused by activities in lots of places, many countries around the world have signed an international agreement to reduce the amount of greenhouse gas emissions they produce. This agreement is called the Kyoto Protocol and it came into force in 2005. Developed countries have a responsibility to do this because they have more wealth and because they produce so much more greenhouse gas emissions than developing countries. Currently, many countries are discussing a follow-up to this agreement to start in 2012.

CARBON FINANCE

One way developed countries are trying to reduce their emissions is to improve the energy efficiency of their factories and cars and other machines. This means producing the same amount of goods, or driving the same distance as before, but using less energy to do it. They are also trying to use energy from sources other than coal and oil that don't produce greenhouse gas emissions, such as sunlight and wind power. Under the Kyoto Protocol, developing countries don't have to reduce their greenhouse gas emissions. However, developing countries can still reduce their emissions, and then sell these reductions – called carbon credits – to developed countries. For example, an organization in a developing country, such as an electricity company, may reduce its emissions by changing from using coal to using water to produce electricity. A company or government from a rich country, then pays the project in the developing country for reducing emissions on its behalf. Because it is often expensive to reduce emissions in a rich country, governments and companies from these countries are looking for such opportunities. This situation has led to the creation of the 'carbon market', where rich countries buy carbon credits (reductions in the emissions of greenhouse

gases, mainly carbon dioxide, also known as CO₂) from sellers in developing countries. The buyer of the carbon credit is able to use this to meet its emission reduction commitments under the Kyoto Protocol. This means that they do not have to cut back so much on their own carbon dioxide emissions.

THE CLEAN DEVELOPMENT MECHANISM

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol and the main means by which developing countries can get involved in the carbon market. The CDM has two main aims:

- To help developing countries to develop through projects that reduces greenhouse gas emissions.
- To help developing countries meet their emission reduction commitments by allowing them to use emission reductions from projects in developing countries.

THE VOLUNTARY CARBON MARKET

Some individuals and private companies are not required by law to reduce their carbon emissions. However, they are prepared to buy carbon credits from projects in both developed and developing countries. This is because they feel responsible for the damaging impact of their emissions and want to do something about it. Sometimes companies buy carbon credits because they believe this is good for their reputation. As buyers are not responding to a government requirement, this market is called the voluntary carbon market.

POOR COMMUNITIES HELP PROTECT THE CLIMATE

Your community can help protect the climate by using sources of energy such as solar, biogas, and hydroelectricity, and you will also benefit from doing so. How do these sources of energy, protect the climate? You will probably use these energy sources instead of polluting fuels such as kerosene, diesel, charcoal, firewood, and coal. These fuels all produce a lot of greenhouse gases and contribute to climate change. If you use less firewood and charcoal, you will also protect your forests, which also helps to slow down climate change. How do you benefit? New energy sources such as solar will allow you to use modern equipment such as TVs and radios. Projects that reduce greenhouse gases may offer you employment, and they may help your community improve the local roads, and build schools and health centres. Also, because you use cleaner sources of energy, your health will probably improve because you are not breathing in smoke and fumes.

REQUIREMENTS OF COMMUNITY-BASED CLIMATE PROJECTS

- The project must reduce greenhouse gas emissions.
- The project must benefit your local community.
- Your community must participate in either the main project or in the benefit plan.
- The technologies used in the project must be affordable.

Carbon projects can benefit your community either directly or indirectly.

DIRECT BENEFITS

When a project benefits your community directly, this means you are able to use the project's technology in some way. Carbon credits enable this technology to be installed. In the biogas program in Nepal and the solar home systems project in Bangladesh (mentioned above), the communities benefit directly by having access to clean, time-saving and efficient sources of energy. They also spend less money on kerosene and diesel, and spend less time collecting firewood. The project also creates jobs and increases economic activity in the area.

INDIRECT BENEFITS

In some projects, the community does not participate in or benefit from the main activities of the project. This is the case in the China Guangrun hydropower project (see below), where the buyer of emissions reductions, the CDCF, had a particular interest in ensuring that the local community benefited in some way. In cases such as these, where there is a buyer prepared to pay a little extra for local development benefits, the project works in your community to provide you with other benefits such as improving the local roads or constructing health centres.

Most scientists agree that human activity is the main cause of these changes in the climate. Over the last 100 to 150 years, as countries have industrialized, they have been burning more coal, oil and gas to provide energy for manufacturing and transport. These activities release large amounts of carbon dioxide (CO₂) into the air. Carbon dioxide is one of the main so-called greenhouse gases, along with methane and nitrous oxide. These gases get their name because they form a layer around the earth, acting like the glass roof of a greenhouse, trapping heat from the sun and preventing it from bouncing back into space. In smaller quantities, these greenhouse gases are useful because they prevent the earth from losing too much heat and becoming too cold for humans to survive. The problem now is that these gases are building up in the atmosphere and trapping too much heat and therefore increasing the temperature of the earth.

Table:1 The contribution of various gases in creating a greenhouse effect

CONTRIBUTION GASES	ACTIVITY CONTRIBUTION	%	AGE
Carbon dioxide (55%)	Power generation		11
	Deforestation		15
	Other activities		29
Other gases (45%)	Hydrocarbons		20
	CFCs		15
	Nitrous oxide		05
	Ozone		05

Source: Environnement sc. & Eng, vol.5, issue-3, Sep-Nov.2007 page No. 66

CORPORATE ACCOUNTING AND THE ENVIRONMENT

Accounting plays a central role in determining what matters. Until it is measured and reported on in financial statements an economic development will rarely receive much attention. Consider how different Michigan would be today if the full cost of health commitments made in the 1960s for retired workers had been fully booked as health premiums rose over the last 20 years. Consider how different New Orleans would look if the documented need for civic engineering, maintenance had been recorded 15 years ago. Whether public or private, we can document numerous cases where there were known liabilities, but there was no accounting requirement to show them on the balance sheet. It takes a disaster for the rules to change. In too many cases, the large cost of responding up front was small, when compared to the cost of the resulting disaster.

Accountants take a great deal of pride in the principles that form the basis of a profession that is best understood as a social science. The profession has a well developed sense of social responsibility. A responsible profession does not need a disaster to generate change. Why then, is the accounting process complicit in the decision to not record important environmental costs? The answer lies in basic accounting principles and points to an opportunity for a fresh interpretation of them. Accounting evaluates processes by a hierarchy of principles that set out highly valued, qualitative characteristics of accounting information. These characteristics require fresh attention in light of the environmental issues society is facing. It is useful to widen the definition of useful information so that the accounting process internalizes more environmental cost information.

The overriding qualitative characteristic of accounting information is decision usefulness. This value was established for the profession when the 2nd Statement of Financial Accounting Concepts was issued (FASB, 1980). This value goes into practice by considering the relevance and reliability of information.

PROFIT FROM ACCOUNTING POLICY INITIATIVES

This research has considered how unreasonable and irresponsible it is for business leaders to accept a simple statement advocating a market solution to address environmental degradation. Society needs responsible discourse that takes into account efficient economic solutions. Accountants that have a deeper understanding of the economic and political situation can contribute to their employers and society more effectively. We all gain if the environmental agenda includes the concerned voice of accountants. As a profession, there is a great deal to be considered and studied that is missed with simplistic statements that market solutions are best. The language of business can incorporate societies need to elevate environmental issues, now that we are reaching the practical capacity of this public good. It is time for this to be treated as a professional responsibility.

The Kyoto accord left countries a great deal of flexibility with regards to the mechanisms they would use to comply with treaty obligations. Even though there is flexibility, the discussion has focused on trading carbon credits based on quota's and productivity scales (Jepma & Van der Gasst, 1998). These public policy responses will be extremely difficult to incorporate into accounting policy. The accounting profession has to respond with more than a recommendation to add sustainability as a measure in the balanced scorecard. We can therefore advocate for three categories of response by professional accountants: inclusion of carbon gas emission markets in the capital budgeting process, reporting environmental impacts in financial reports, and advocating for the most efficient regulatory approach for each sector of the economy. Accountants that respond in these ways will contribute to the competitive advantage of their firms and society.

The first step is to consider future costs in capital budgeting models. A carbon credit market based on output permits is costly to implement. Many businesses can expect that the cost of this will be higher than an input tax such as the one we have on gasoline now. Since we cannot assure a change in policy direction, it is prudent to make investments with the output mechanism in mind. Retrofitting existing systems and processes to record emissions is expensive and disruptive. Firms that build in such capacity now, create a competitive advantage in the future. Costs of training are also likely to sky-rocket. Firms that establish relevant training now will compound their cost advantage. The return on these investments will be a great benefit to the stockholders. This is no more than a good risk assessment. Enlightened accountants will look for and emphasize these preparatory investments when they are evaluating capital budget proposals and participate in setting budgetary priorities.

The second opportunity is to report environmental assets and liabilities on the balance sheet now. There is a long learning curve required to incorporate carbon credits in the reporting process. Firms can develop experience with carbon assets by preparing procedures for determining market values and disclosing unrealized gains or losses on a pro-forma basis. They can also implement processes to collect and disclose carbon emissions much like those we have for disclosing future lease and debt payments. This disclosure will increase awareness of future costs and create stockholder confidence in firms that can give a clear accounting. Reporting on carbon offset projects, as we now report on research and development pipelines, form a third opportunity. The market will be able to value the firms' ability to create marketable credits in relation to their competition. In every case, a proactive accounting policy enhances the ability of management to see tangible benefits from environmental investments. Every time regulation is increased firms that employ enlightened accounting processes will be rewarded with a market that can assess their readiness.

A third opportunity for accounting professionals is to advocate for effective regulation. Those that are forming public policy are in a difficult position. They have a duty to take action and deal with a population of voters that do not appreciate the cost of accelerating environmental degradation. When accountants label all regulation as undesirable they miss an opportunity for considerable economic gain. Firms can gain a competitive information advantage when they involve themselves in the process. A model that regulates output efficiency will cause high implementation costs on some sectors. Firms could create a sectoral trade advantage by supporting and endorsing regulation that is less costly. For example, a US sector might gain a cost advantage over Canadian firms if it convinces US regulators to adopt a regulation, such as an input tax, that has low measurement and transaction costs.

Industries are growing at a fast pace in India. Industries also are potential contributors to the degradation of the environment leading to water pollution, air pollution, noise pollution and so on. Unplanned and uncontrolled industrial development leads to incompatible land use patterns, thereby increasing the risks to the receiving environment. The protection of the environment can be achieved by proper planning and management of various spatial entities viz. water resources, land, settlements, forests, etc. in the most effective manner. As in many other parts of the country, developmental activities and human pressure, including tourism, have had an adverse impact on the environment of Goa. Like other states being affected by the rapid industrialization Goa too now is at the stage of great concern for the environmental conservation. Several issues, which need to be looked upon, include Waste management, pollution of wells in villages, uncontrolled construction with little attention given to protect the delicate ecosystem and many others. There seems a lack of basic infrastructure for proper management and sustain the pressure of the massive flow of tourists every year. Though Goa aspires to be a modern state in many ways, unlike some specially protected

states it has been a kind of open house to welcome our new industries and other developmental activities.

AIR POLLUTION IN GOA

The 18 industrial estates, from Pernem in the north to Madcaim in the heart of Goa, and down to Canacona in the South, have led to a severe pollution in the last few years. The metallurgical units and the steel rolling mills at Kundaim plateau emit voluminous fumes, as scrap iron is openly melted in blast furnaces. The carbon dioxide fumes generated during the production are a threat to the temple towns of Mardol, Mangueshi and Kundaim. The Tapobhumi temple complex is in the windward direction of the Kundil steel rolling mill directly affected by the acid rains generated by the heavy smog produced by the carbon dioxide and the sulfur dioxide fumes of the plant. The steel units around Pernem have polluted the atmosphere in that region. Likewise, the industrial estates in Cuncolim and Madcaim had led to many health hazards to the local villagers. Table 3.5 shows State-wise distribution of industrial units, according to their air pollution control status as reported by the SPCBs. The table indicates that Goa has 18 air polluting units and has 100% of units with air pollution control measures and with satisfying standards. It has 7 High polluting units and all of them (100%) have satisfying standards.

Table -II State-wise distribution of industrial units, according to their air pollution control Status

State	Number of air polluting units	% Units with APC measures	% of units satisfying standards	Number of HPU's	Number of HPU's with facilities to satisfy standards
Andhra Pradesh	2520	79.84	79.84	220	96.36
Assam	86	38.57	32.56	15	60
Bihar	1386	40.55	40.55	40	82.5
Goa	18	100	100	7	100
Gujarat	5757	59.74	54.87	200	95
Haryana	1513	74.88	26.76	2580	40.19
Himachal Pradesh	983	74.67	74.67	12	50
Karnataka	6902	59.79	46.33	113	91.51
Kerala	1528	62.04	24.41	24	91.57
Madhya Pradesh	526	58.63	68.63	88	98.86
Maharashtra	7008	72.6	58.86	318	95.59

Manipur	26	100	100	4	*
Meghalaya	81	14.81	0	1	100
Punjab	8299	17.62	17.62	51	76.47
Rajasthan	430	91	*	49	97.95
Tamil Nadu	6998	86.12	*	188	98.4
Uttar Pradesh	281	90.75	80.07	627	83.41
West Bengal	6188	*	*	64	81.25

* Not specified by the SPCB Source: <http://envfor.nic.in/cpcb/hpcreport/vol3h.htm>

A BRIEF OUTLINE OF THE SURVEY DESIGN, SURVEY PLAN AND THE QUESTIONNAIRES

Very limited information is available regarding industrial water and air pollution in Goa. There are also very limited studies that deal with economic issues concerning industrial pollution on the environment. This makes it difficult to understand natural resource accounting of industrial pollution. Thus, an intensive survey of various large, medium and small-scale industries is being conducted to gain an insight on the pollution load of such industries on the environment. Both North and South Goa are being covered by the survey to get an overall picture of the state. The target population of the survey is large scale, medium scale and small-scale industries. The prime respondents are the managers of the industries. 31 industries are being covered by the survey.

Table -III Vehicles in Goa State as on 31-3-2001

Type of Vehicle	No. of Vehicles
Motor Cycles on hire	4,913
Motor Cycles and Scooters	238,740
Private Cars and Jeeps	53,569
Taxis	6,788
Goods Vehicles	21,592
Buses/Mini Buses	3,175
Auto rickshaws	3,061
Government Vehicles	3,392
Total	335,230

Source: www.southgoa.nic.in

Table -IV Emission Factors by vehicle type (gm/km)

Type of vehicle	year	CO	HC	NO _x	SO ₂	Particulars	Pb
Cars & Jeeps	Up to 1991	25	5.00	5.00	0.053	-	0.030
	1991-94	19.8	2.73	2.00	0.053	-	0.030
	1994-95	19.8	2.73	2.00	0.053	-	0.008
	1995-99	6.45	1.14	1.14	0.053	-	0.003
	1999-2000	3.16	0.56	0.56	0.053	-	0.003
	2000-05	2.2	0.25	0.25	0.053	-	0.003
Two wheelers	Up to 1991	8.3	5.18	0.1	0.023	-	0.008
	1991-94	6.49	4.5	0.1	0.023	-	0.008
	1994-96	6.49	4.5	0.1	0.023	-	0.002
	1996-2000	5.00	4.32	0.1	0.023	-	0.002
	2000-05	2.4	2.4	0.1	0.023	-	0.0002
Three wheelers	Upto 1991	12.00	7.00	0.26	0.029	-	0.019
	1991-94	12.00	7.00	0.26	0.029	-	0.019
	1994-95	12.00	7.00	0.26	0.029	-	0.005
	1996-2000	8.1	6.48	0.26	0.029	-	0.005
	2000-05	4.8	2.4	0.26	0.029	-	0.0004
Commercial	Upto 1991	12.7	2.1	21.00	1.5	3	-
	1991-96	12.7	2.1	21.00	1.5	3	-
	1996-2000	9.96	1.44	16.8	0.75	2.4	-
	2000-05	5.35	0.66	9.34	0.37	2.4	-
Type of vehicle	No of vehicles (2001)	CO	HC	NO _x	SO ₂	Particulars	Pb
Cars & Jeeps	53,569	0.3455	0.0610	0.0610	0.0028	-	0.00016
Two wheelers	243,653	1.2182	1.0525	0.0243	0.0056	-	0.00048

Three wheelers	3,061	0.0247	0.0198	0.0007	0.00008	-	0.000015
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Table -V Per Capita Energy Consumption of different fuels in Goa.

Fuel	Per capita monthly consumption (2001)
Firewood (Kg)	7.03
LPG (Kg)	10.7
Kerosene (litter)	2.46

Source: NSSO, 1999-2000. National Sample Survey Organization, Department of Statistic, GOI

Table -VI Emission Factors for Fuels (gm/kg) 2

Fuel	CO	TSP	SO ₂
L.P.G.	14.9	0.5	
Fire Wood	66.5	1.0	
Cow-dung	61.4	0.6	
Coke/lignite	20.0		17.0
Charcoal	275.1	2.4	
Kerosene (pressure stove)	62.1	0.7	
Kerosene (wick stove)	17.7	0.5	

Source: TERI, 2000

Table -VII Household using different types of fuel for cooking in Goa

Type of fuel	Total	%
Firewood	94,800	34%
Kerosene	33,167	11.9
LPG	145,453	52.1

Source: Census of India 2001

The table below gives the annual consumption of different types of fuel and emission of CO and

TSP. The total annual consumption of LPG, Kerosene and Firewood is 12140850 tonnes. The annual emission of CO is 887428188 tonnes and TSP is 13321349 tonnes.

Table-VIII *Emissions from different types of fuel in Domestic sector in Goa*

Types of fuel	Total annual consumption (tonnes)	Total Emissions (Tonnes)	
		CO	TSP
LPG	33546	550977	18489
Kerosene	130508	8933705	100702
Firewood	11976796	877943506	13202158
Total	12140850	887428188	13321349

Source: Census of India 2001

TYPES OF FORESTS FOUND IN GOA

The forests of Goa are typical of the Western Ghats forest (Southern Maharashtra and Karnataka). There is diversity in the forests due to the variation in altitude, aspect, soil characters, slope, etc. As per Champion and Seth (1968) Classification of Forest types of India, the forests of Goa fall in the following types:-

- Estuarine vegetation consisting of mangrove species along narrow muddy banks of rivers.
- Strand vegetation along the coastal belts.
- Plateau vegetation confined especially to lower altitude.
- Open scrub jungle.
- Moist mixed deciduous forests.
- Secondary moist mixed deciduous Forest.
- Sub-tropical Hill forests.
- Semi-evergreen and evergreen forest limited to patches along the high altitude.
- Lateritic Semi-evergreen forests.
- Evergreen forests.

So what is an environmental asset and how does it relate to non-profits? An environmental asset is an emission allowance or carbon offset credits (a generic term meaning that a value has been assigned to a reduction or offset of greenhouse gas emissions.[1])

Three scenarios come to mind for how non-profits may be involved with environmental assets:

- When an organization receives donated carbon credits for sale to market participants.
- When an organization internally generates carbon credits from its programmatic activities and certifies the credits for sale to market participants.
- When organization, operations become subject to carbon emission quotas in the US or internationally.

The debate continues around the public policy governing carbon emission programs as well as the accounting guidance for environmental assets. Several different market solutions have been proposed for carbon emission programs which would result in environmental assets and/or liabilities. As discussed in the August 2008 Journal of Business & Economics Research article, the proposed market solutions include:

- Use of fees on polluting inputs,
- System of quotas, whereby companies with the opportunity to reduce carbon emissions could sell their unused, excess quota of carbon savings,
- Establishment of output efficiencies which would be monitored and compared to a baseline carbon use, and Carbon offsets.

CARBON OFFSETS:

Accounting treatment of donated carbon credits and internally generated carbon credits generally relate to the fourth proposed market solution, carbon offsets. Carbon offsets have to be regulated and certified because of their intangible nature. The carbon credit's value exists because of the trust that exists in the system which validates the credit's existence and value as a commodity. Verification is key for accountants, auditors, and the public at large if carbon credits are reported as assets in a company's financial statement.

While the accounting for Emission Trading Programs and initial carbon offset recognition is currently under debate by the FASB, other discussions and white papers provide some guidance about accounting treatment.

The different treatment options under consideration are impacted by the method with which the carbon credits are acquired, whether by internal creation, purchase or donation to the organization. The different accounting treatment options also consider the intended use of the credits – will they be used for an organization's own compliance purposes or sold to market participants? The accounting options under debate provide for a vast difference in the impact to the bottom line (2). Simply stated, the main differences in the accounting treatment for carbon credits is whether they are treated as inventory or intangible assets, and whether they are marked to market or held at cost. Carbon credits acquired from a donation could be recognized at fair value, and those acquired as a purchase could be valued at cost. When carbon credits are internally generated, accounting for them as inventory would result in balance sheet recognition. Alternatively, accounting for internally generated carbon credits as intangible assets results in a series of expenditures on the statement of activities and virtually no balance sheet recognition. Any adjustments to either inventory or an

intangible subsequent to initial recognition may be necessary because the carbon credits are either 1) held for sale and therefore adjusted to fair value on a recurring basis, or 2) intended for use and therefore expensed or amortized over a systematic basis.

EMISSION ALLOWANCES

According to Price Waterhouse Coopers (PWC), the IASB has determined that emission allowances received free of charge by the government for use in operations would create an asset and liability upon receipt of the allowances, recognized at fair value (3). Because the FASB has yet to issue guidance, PWC recommends that all allowances granted, free of charge or internally developed be recognized at \$0, and only purchased emission allowances be recognized at fair value. Similar to carbon credits, emission allowances used by an organization could be expensed or amortized over a systematic basis.

WHAT NEXT?

Until the authoritative guidance is issued, an organization should keep in mind several key considerations when establishing a policy for accounting for environmental assets (4):

- Develop an accounting policy based on thoughtful analysis as to the use of the environmental assets of the organization and with consideration of how future events may impact financial results. The policy must be applied consistently; therefore decisions made now may impact future reporting.
- Monitor issues that may arise during the accounting period (e.g., expense recognition, impairment, accounting for shortfalls of allowances or credits, vintage-year swaps, and revenue recognition for excess sales) to ensure appropriate consideration and resolution.
- Present and disclose environmental assets in line with accounting policies and intended use (based on materiality)
- Evaluate instruments for derivative accounting. Forward, future, swap or option contracts may qualify as derivative instruments.
- Remember to account for renewable energy credits, whether they are generated through production, purchased on the market, or embedded within a power purchase agreement.

Unlike more familiar intangible assets dealt with in accounting, such as goodwill, brand value, or manufacturing know-how, carbon credits are created by regulators and are acquired by corporations through a number of paths:

- Obtained through an allocation from a regulatory body at no cost or a cost that is less than fair value.
- Purchased from a regulatory body in an auction process.
- Purchased from another market participant or through an exchange.

The cost basis can vary from zero to a market-determined price, which is likely to be varied as a result of a number of factors. Second, carbon credits arguably have characteristics of both an intangible asset and inventory. According to the definition of intangible assets, they lack physical substance. And they do have a finite life. But unlike typical intangible assets, they do not amortize over that finite life. But surrender to the regulatory body at the end of a compliance cycle. Carbon credit is indeed a key cost of production and can be viewed as no different from other inputs. The two possible accounting value methods for initial recognition of carbon credits are “cost” and “fair value.”

Assets acquired through purchase are commonly recorded at cost, but for carbon credits a direct cost recording is complicated by the fact that many entities have some credits that were allocated at no cost and some that were separately purchased. And while the cost basis was preferred in the US Federal Energy Regulatory commission (FERC) guidelines. It is rare that assets with a verifiable market value are acquired free of cost, but it is possible to support such an approach with a concomitant recognition of an off-setting government grant.

Finally, keep an eye on the FASB’s updates to watch for new guidance about how to account for carbon credits and emission allowances.

SUMMARY

Goa has a total of 506 factories, which forms 0.4% of total factories in India and employing 20,740 people. The total expenditure on fuels in Goa in the year 2002-03 was Rs.40843 lakhs. The focus is on seventeen “high polluting” industrial sectors as identified by the Central Pollution Control Board (CPCB) for implementation of pollution control programs. The results from IPPS have been used in various countries where insufficient data on industrial pollution proved to be an impediment to setting up pollution control strategies and prioritization of activities. Value of output for ten polluting industrial sectors of Goa is Rs.65, 70,340 (thousands). The pollution load of SO₂ is found to be highest amongst the three air pollutants with iron & steel industry contributing the most SO₂ pollution load i.e., 97579 tonnes/yr. The abatement cost is Rs.1734548 (thousands), maximum for Basic drugs and Pharmaceutical for abatement of each ton of SO₂.

Last year India and China were the largest sellers and Europe was the largest buyer with the International carbon trading crossing \$120 billion. India has generated some 30 million carbon credits the 2nd highest in the world, and has roughly another 140 million to push into the world market. Waste disposal units, plantation companies, chemical plants and municipal corporations can sell the carbon credits and make money. It is expected that in the near future India may make up to \$5-10 billion just from generating 573 million carbon credits. For example the Jindal Vijayanagar Steel plant recently declared that in the next 10yrs it will be able to sell \$225 million worth of carbon credits by using superior furnace technology. An example of the local public efforts is the Handia Forest in Madhya Pradesh where 95 rural villages stand to gain approximately \$3, 00,000 per year just by reclaiming community forest cover. We are capable of being green at levels that are simply not possible for the other developed nations. Our booming economy allows to develop and design buildings and other infrastructure in the most eco-friendly way. A Latest breakthrough has been made by Indian architects in the construction industry with office-building designs that use up minimum electricity for illumination and air-conditioning. It is estimated that Indian business offices that are primarily non air-conditioned save up to 300-500 tonnes of carbon dioxide emission

compared to a/c ones with minute different in productivity. With less loose cash at the beginning of the Start-up and better business minds Indian entrepreneurs are way ahead in cashing in on the carbon trading ventures making India one of its fastest growing markets. With the implementation of the NREGA plans by the Indian government the number of green jobs has increased with efforts to setup large Waste removal plants, non-conventional energy source stations, forest preservation branches, and creation of bodies for generating awareness among the masses. Simply by undertaking any such activity on a small scale and affiliating to the UNFCCC we all can both avert the environmental crisis and also improve the nation's economic situation. More efforts should be made by us to use state-of-art technology based on environmental friendly research to carry out production and services. Genuine efforts to educate and imbue interest in the youth to go in for ecological and environmental research work should be done. Institutes like TERI, which offer courses in environmental management help produce some of the best eco-managers whose value will only increase as we go more conscious of our natural surroundings and eco-agencies become more vigilant. Though we are potentially the largest market for carbon credits on the MCX, we still need to implement proper policies to allow trading of certified emission reductions (CERs), carbon credit. To increase the market for carbon trading Forward Contracts (Regulation) Amendment Bill has been introduced in the Parliament. This amendment would also help the traders and farmers to utilize NCDEX as a platform for trading of carbon credits. However, to unleash the true potential of carbon trading in India, it is important that a special statue be created for this purpose as the Indian Contracts Act is not enough to govern the contractual issues relating to carbon credits. Thus we see that Carbon Trading is definitely the "Greenest" pastures (pun intended) for business trading for the small and large scale private and governmental sectors in India with opportunities for everyone.

CONCLUSION

This paper has examined how the perception regarding carbon credits can be misleading. Deeper understanding of the issue and the structural problems associated with societal decision-making regarding public goods are needed. Accountants can heighten corporate discussions through broadening their firm's capital budgeting criteria, developing relevant, forward looking financial systems, and advocating for economically efficient regulation. There is no need for accountants to passively react to the growing problem of environmental degradation. This paper has explored the way accountants can contribute to their firms by fulfilling their professional role in society.

There is a moral hazard for professional accountants. An accountant could identify their effort as small and inconsequential compared to the political and scientific influences within the environmental discourse. That thought could be used as a rationale for not taking action. Taking comfort in that rationale does not fully reflect the pervasive impact of accounting policy has as the language of business. Accountants do play a role in shaping responsible public policy as a member of the business community. Their employers and clients will benefit from being able to avoid a crisis caused by lack of preparation if the accounting community takes action. We only have to examine the passive role of the accounting community in setting conditions that allowed the sub-prime crisis to occur. The financial impacts of environmental degradation are far more significant. Attention to accounting policy regarding carbon credits can be the profession's positive contribution the societal discourse about environmental degradation!

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