

Of Global Warming and Indigo Economy

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[The climate change issue is dividing the globe into two broad categories- namely 'green' and 'indigo' economies. The 'indigo economy' represents economic activities which primarily use dirty and polluting production process. This also represents an economic activity that is mostly meant for global markets and is detrimental, as was the case of indigo plantation of the 18th century, to the large section of the local population. The environmental disaster that occurred in the Union Carbide plant at Bhopal in 1984 that killed over 20,000 people is a case in point. In South Asia the 'indigo economy' has a colonial root when indigo plantation was started in undivided Bengal in 1777 by the British planters as demand for indigo, as a dye, was rising very fast in Europe. The paper concludes that the developed economies are becoming 'green' at the expense of the developing economies which are turning 'indigo' by absorbing increasing amount of 'Franken foods' and industrial pollutants, including nuclear radiation. Though industrial pollution could be checked in future through the induction of green technology, introduction of GM seeds will destroy the age old agricultural practices permanently. Once the indigenous seeds and biodiversity are lost, these are lost for ever.]

In South Asia the 'indigo economy' has a colonial root which dates back to 18th century when indigo plantation was started in undivided Bengal (India) in 1777 by the British planters as demand for indigo, as a dye, was rising very fast in Europe. Peasants were forced to cultivate indigo instead of food grains that led to starvation and famine. The British textile economy was flourishing at the expense of agro-based cottage economy of Bengal which was forced to languish. Now the climate change issue is dividing the global economy into two broad categories-namely 'green' and 'indigo' economies.

The 'indigo economy' represents economic activities which primarily use dirty and polluting production process. This also represents an economic activity that is mostly meant for global markets and is detrimental, as was the case of indigo plantation of the 18th century, to the large section of the local population. The developed economies of the North, which are increasingly using cleaner technology to minimize pollution and are relocating dirty industries to less developed countries, would become 'green' at the expense of the developing economies of the South, which would gradually turn 'indigo' by absorbing increasing amount of industrial pollutants (including nuclear radiation).

A UN study indicates that the shares of gross domestic product (GDP) of the developed economies are likely to fall in next two decades and the share of GDP of the developing economies would rise.

As the GDP of the developing 'indigo' economy is expected to rise, this economic parameter commonly used to distinguish between the developed and under developed regions/countries would become increasingly irrelevant. Instead, 'rate of growth of green house gas (GHG)/pollution level' of a region/country would be a better parameter to measure 'development' in true sense. Countries with negative GHG rate would be termed as 'green economies' and the countries with positive GHG rate—mostly the developing countries would represent the 'indigo' economies.

With the emergence of industrial revolution in Europe, textile industry flourished in Britain tremendously. Indigo—a herbal product was the essential ingredient to allow

required brightness of cotton products. The colonial British rulers made India the supplier of raw materials for their mills and factories. As early as 1777, indigo plantation was started in different parts of Bengal province. The indigo planters left no stones unturned to make money and mercilessly pursued the peasants to plant indigo instead of food crops. Loan, called 'dadon' was provided at a very high interest. Once a farmer took such loan he remained in debt for whole of his life before passing it to his successors. The price paid by the planters was insignificant and the farmers could make no profit by growing indigo. They were totally unprotected from the cruel planters who resorted to mortgage or destruction of their property if they were unwilling to obey them. The colonial government rules also favored the planters. Even the native land lords, money lenders and other influential persons sided with them. Then during 1859-61, the farmers resorted to revolt against the British indigo planters.

In the late sixties and early seventies of the last century, the idea of relocating 'off-shoring' of manufacturing activities to other countries became popular. Management gurus like Raymond Vernon (1966) attempted to explain patterns of international trade by observing a circular phenomenon in the composition of trade between countries in the world market. Developed countries which had the ability and competence to innovate, became initial exporters of goods. Then they transferred the technology, initially to the developing countries and subsequently to the less developed countries, and eventually became importers of these goods. Thus by exploiting the cheaper factors of production—namely labour and raw materials of the developing countries of Asia, Africa and South America, multinational corporations (MNCs) of Western Europe, Japan and USA earned super normal profits. It may be recalled that in the decades of 1960s and 1970s, 'transfer of obsolete technology to developing countries', was the main allegation against multinational companies. That was the period when standardized cheap products of multinational corporations, produced in the developing countries, diffused into the local markets replacing many indigenous products. Standardized spare parts and low end products, produced at the subsidiaries of multinational firms in the export processing zones (EPZs), were also 'exported' to the parent firms. In addition to cutting production cost through this process of transferring obsolete low grade technology to developing countries where labour and natural resources were cheaper, the MNCs of the developed countries could also reduce the level of pollution, in the developed home countries.

Since 1980s, when consciousness about environment had entered in the political and economic discourse of the developed countries, pollution became a major driving force for relocation of various manufacturing activities to off-shore destinations. Strict environmental regulations in developed countries compelled multinationals to relocate many polluting industries to underdeveloped countries. The environmental disaster that occurred in the Union Carbide plant at Bhopal in 1984 that killed over 20,000 people is a case in point.

It was alleged that in 1991, Larry Summers, the Chief Economist of the World Bank (and later President of Harvard University), in a private conversation had justified the dumping of toxic wastes to the developing countries. He extended the economic logic of exporting first world waste to developing countries by arguing that

The countries with the lowest wages would lose the least productivity from "increased morbidity and mortality" since the cost to be recouped would be minimal; The least developed countries, specifically those in Africa, were seriously under-polluted and thus could stand to benefit from pollution trading schemes as they had air and water to spare; and that

Environmental protection for "health and aesthetic reasons" is essentially a luxury of the rich, as mortality is such a great problem in these developing countries that the relatively minimal effects of increased pollution would pale in comparison to the problems these areas already face.

Thus countries like India and China have become the dump yards of developed countries' waste, including electronic waste. Toxic wastes are recycled in these countries, mostly in the informal sector, in a hazardous condition. Heavy metals pollution has turned the hamlets of southern China into cancer villages. "China has many 'cancer villages' and it is very likely that these increased cases of cancer are due to water pollution," said Edward Chan, an official with Greenpeace in southern China. World Bank study (2007) revealed that due to environmental pollution, around 4, 60,000 people had died in China.

Then in 1997, the Kyoto Protocol (KP) made an elaborate attempt to institutionalize the process that was theorized by Larry Summers. The clean development mechanism (CDM) under KP has allowed the industrialized nations to offset emission at home by buying carbon credits from developing world. Inter-governmental Panel for Climate Change (IPCC) - the authoritative scientific voice on climate change once examined the potential for emissions leakage from the industrialized to developing countries. Within the specific context of the Kyoto Protocol, the IPCC concluded that "the possible relocation of some carbon intensive industries to Non-Annex 1 (developing) countries and wider impacts on trade flows in response to changing prices may lead to leakage in the order of 5-20 percent". As the first commitment period has started only in 2008, it is too early to judge the effectiveness of the CDM and other mechanisms under KP in addressing the climate change related issues. However, initial findings indicate that compared to 1990, emission of the Annex I Parties was 5.5 percent lower in 2006. But between 1990 and 2004, the GHG emission worldwide has increased by around 24 percent implying that during this period, there was a strong possibility that emission got transferred to Non Annex I developing countries. Thus the Annex I countries became 'green' at the expense of 'Non Annex 1' countries which turned to 'blue' by absorbing the pollution of the developed "North".

A study on the 'balance of emissions embodied in trade' (BEET) for a number of countries substantiates the above apprehensions. It has concluded that China's BEET (embodied emissions in exports less embodied emissions in imports) was 585.5 MtCO₂, compared to the UK's BEET of (-)102.7 MtCO₂. The corresponding figures for Germany, Japan, USA and India are (-) 102.7, (-) 139.9, (-) 197.0, (-) 438.9 and (+) 70.9 MtCO₂ respectively. This indicates, by importing goods (net) manufactured in other countries, UK could transfer 102.7 MtCO₂ of carbon emission to the exporting countries.

In these emerging 'blue economies', where substantial amount of investment is expected to flow in next few years, huge opportunities await small and medium enterprises (SMEs). The UNFCCC report (August 2007) has made an analysis of the projected future investments and financial flows for the year 2030 taking into account both the reference scenario and mitigation scenarios. The report has predicted a decline in the proportion of investment in primary sectors like agriculture, forestry, fishing and mining. Compared to these, significant increase in the proportion of investment have been projected for few specific sectors namely transportation, storage and communications, financial intermediation, real estate, renting and business activities.

Among the Non-Annex I economies, the developing Asia would attract substantial investment. During 2002 and 2030, the projected investment flows in industrial sector indicate a sharp rise in the share of investment in the developing Asia. In this period, it would rise from 21.77% to 44.23%. Compared to this, the projected share of investment in the OECD member countries would decline to 46.24% from 62.78%. The projected investment flows in residential and commercial sector would follow the same trend.

The projected figures on 'transport related investment' indicate that the global investment in motor vehicles would increase from US\$ 69 billion in 2002 to US\$ 209 billion in 2030. During the same period, the gross investment in 'transport and trade' (that includes infrastructure investments as well as all other transport equipment not considered road vehicles) is expected to grow from US\$ 1.1 trillion to US\$ 4 trillion. China and India are expected to attract maximum investment.

Economists have differed widely on the amount of funds (cost of emission reduction) that would be required to meet the challenge of global warming and mitigate green house gases (GHG) in future. Compared to two other major studies on this, one by Enkvist et al (2007) on behalf of *McKinsey Quarterly* and the other by Sir Nicholas's Stern (2006) commissioned by the British government, the UNFCCC (2007) estimates look very conservative. Sir Stern's report predicted that, in a "business as usual" situation, the cost of climate change would be equivalent to losing at least 5 to 20 percent of global GDP each year. However, according to him, the cost of mitigation would be 'as low as one percent' of global GDP each year.

To restrict GHG emission to a level (450 pert-per million) there by not allowing the average global temperature to rise more that 2 degree C in 2030, the required investment in green technologies, as per Enkvist et al, would range between 500 billion Euros and 1,100 billion Euros. These figures translate to 0.6 -1.4% of the global GDP in that year!

The transnational corporations of the developed economies of the North, with strong support from their home states, have used the climate change issue as a strategic tool to retain their economic supremacy. They have successfully converted this challenge into an opportunity and elaborate business plans have been prepared to take advantage of the same.

To enhance the expanding market of clean technology and to offset possible asymmetries in competitiveness of the domestic firms of the developed countries, arising out of 'carbon leakage' to the developing countries, two types of entry barriers are being considered to be imposed on goods with high quantities of 'embedded carbon'.

- (a) Border tax : In order to offset the 'hidden' subsidy' these goods receive, it is proposed to impose countervailing duty (against 'de facto subsidies') or an anti-dumping duty (against 'environmental dumping') on these imported goods produced in countries that do not impose climate change related regulations.
- (b) Non-tariff barriers like denial of market access for non compliance of certain set rules/standards : A provision in the America's Climate Security Bill (2008), proposed by Senators Leiberman and Warner, aiming at penalizing other nations by imposing restrictions on their exports to USA, if they fail to reduce GHG emissions, is one such move. As per the provision, if two years after the enactment of the US program, it is

found that a major emitting nation has not taken comparable action, the legislation would require importers of GHG-intensive manufactured products from that nation to purchase US 'offsets'. The number of offsets to be purchased would be calculated based on the embedded carbon in the good in question. Though the onus is put on the importers, in actual practice, this provision will force the exporters of 'carbon embedded goods' to switch to cleaner production process by replacing the existing technology with greener ones. Legislations like the Carbon Labeling Act of 2008, as proposed by the state of California would also act as a non-tariff barrier to carbon embedded goods from the developing countries. These measures will substantially increase the market for green technology.

The Copenhagen Conference (December 2009), has marked the beginning of a new way forward by involving USA and emerging economies of the developing South in tackling the climate change issue. Both the developed and developing countries have agreed to an international role in monitoring any emission cuts they commit themselves to. While the Kyoto Protocol addressed about 30% of global carbon emission (major polluter like USA did not ratify the Protocol), the framework accord hammered out in Copenhagen may encompass the majority of world emissions. With the active participation of USA in the expanding global carbon market, 'Green imperialism' is likely to become more aggressive in near future.

It may be noted that the European Union (EU) and USA have taken two distinct approaches in tackling the climate issue and seize the advantages of the new business opportunities it has created. The EU has taken the 'mitigation strategy' and is trying to address the main cause (emission of green house gases) of global warming by promoting clean technology and alternative fuel.

As a late entrant to this lucrative market, the USA has put its thrust on 'adaptation strategy' to reduce the adverse impact of climate change on food production. Being the driver of the 1st green revolution, USA continues with their strategy to remain focused on global food market, especially in the densely populated Asian and African regions, where the demand for food has been growing steadily. As before, the present push is on mass production through diffusion of new farming technology, including genetically modified seeds (GMS), across the globe?

GM-FOOD

Apprehension of a 'drought like situation' due to climate change has given an opportunity to introduce genetically modified seeds and launch the second green revolution to feed the hungry mouths of Asia, Latin America and Africa. US biotech giants like Monsanto is trying to capitalize this opportunity by aggressively promoting its GM seeds as a solution to this emerging crisis. In Copenhagen climate conference (CoP15) Monsanto has been lobbying hard for carbon credits for their 'Roundup Ready' crops, which are being grown for agro fuel. 'Roundup Ready' soy doesn't need plowing because it can be heavily sprayed with herbicides. Not plowing the fields leaves more carbon dioxide in the ground, but the vast spread of soy monocultures in Latin America have caused deforestation, displacement of people, and massive amounts of toxic weed-killer being used instead. Monsanto also wants GM soy to be funded under the Clean Development Mechanism (CDM) which would allow polluting industry in the developed world to offset their emissions by buying credits from GM soy projects.

Monsanto, which had launched its genetically modified cotton in the Indian domestic market in 2002, also sells hybrid corn, fruit and vegetables, and several other

agrochemical products in the country. Monsanto is focusing on the development and launch of new vegetable seed varieties (like Bt brinjal) in the Asian markets, especially in India and China. It has sought regulatory approval in India to sell its genetically modified (GM) corn that is tolerant to herbicides and provides protection from pests. The GM corn, currently undergoing field trials in the country, would be the second such product, after Bt cotton. The firm has received approval from India's Genetic Engineering Approval Committee to conduct field trials to evaluate the bio-safety of the genetically modified product against target insects and weeds.

While the governments (including the mainstream agricultural experts) of developing countries like India have advocated for the application of agricultural biotechnology for tackling the climate change related issues, EU has a different view on this. Instead, they have been encouraging traditional farming practices and consumption of organic food. In USA also, conscious attempts are being made at different forums to promote organic food.

In late sixties, the American policy makers thought that their extensive role in the agricultural revolution would be considered as the 'most successful involvement abroad since the Marshal Plan'. Later, evaluating the 'serious mistakes' of the revolution L R Brown who, as the head of USDA's International Agricultural Development Service, was one of the architects of the policies that permitted the United States to play a key role in launching the green revolution, commented 'Mistakes have been made, some times serious ones. But lessons have been learned too.... One important lesson learned is that we Americans, with our great wealth and energy, can stifle initiatives in others and discourage the very acts of self help that are needed most... India is not the only country in which we made this mistake. This is a good example of how we can do positive harm abroad if we base our policies on a narrow, short-run interpretation of our own economic interests'.

After four decades, the US Secretary of States Hillary Clinton, in her visit to India during October, 2009, has spoken about learning from the past 'experience with development'. She said, 'The US approach to food security will be informed by our experience with development. The truth is, we have spent too many years and too much money on development projects that have not yielded lasting results. But we have learned from these efforts'.

Large scale application of agricultural biotechnology, to boost agricultural yields, will bring in sweeping changes in the cultivation and food consumption pattern of China, India and other developing countries. If GM seeds and other associated inputs actually increase the production of essential crops, these GM foods, discarded by the health and environment conscious consumers of many developed countries especially in Europe, will be sold at an affordable 'fair' price to the hungry billions. Total absence of any food safety regulation will make these unprivileged populations extremely vulnerable to various food related disorders. As this new agricultural technology is 'capable' of providing high yield even when applied in barren; arid and saline lands, fertile lands will be earmarked for the cultivation of local varieties using traditional farming practices and rain water. Those 'organic' products will be exported and sold at a 'premium price' at the high end retail stores across the world. And GM products will be cultivated with arsenic contaminated underground water. □□□