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Green finance is essential for economic development and sustainability

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ABSTRACT
Green finance is part of a broader occurrence; from the incorporation of various non-financial or ethical concerns onto the financial universe. Generally green finance is considered as the financial support for green growth which reduces greenhouse gas emissions and air pollutant emissions significantly. Green finance in agriculture, green buildings and other green projects should increase for the economic development of the country. In this paper an attempt has been made to describe green financing in a boarder sense.

Keywords: Environment, Green building, Green finance, Green projects, Renewable energy.

1. INTRODUCTION
In the 21st century green financing becomes essential part not only in business but also in environment science. All the nations, developed and developing should take the attempts for green financing. It is estimated that global green financing in green infrastructure will reach to $40 trillion between 2012 and 2030.

Green finance is the principle of green credit. It refers to a series of administrative means requiring that commercial banks and other financial institutions carry on researches and developments to produce pollution treatment facilities, be engaged in the ecological protection and restoration. It also develop and utilize new energy resources, focus on the circular economic production, green goods production, and ecological agricultural production, provide loans to support relevant enterprises and institutions and implement concessionary low interest rates, but restrict new project investments of polluting enterprises accompanied with some punishable interest rates (Xu 2013).

In this paper we have stressed in green agriculture, green buildings, green banking, green marketing and some other green projects. Government and non-government organizations should take steps to implement green finance in the society for the sustainability of the future generation.

2. OBJECTIVES OF THE STUDY
In this paper we want to describe green financing in some details. As the business is related to environment, so that finance in green projects become an essential part of the sustainability of organizations. Our aim is to establish green financing in grass root levels of the country. In our research we emphasize the global green finance programmes at present and future.

3. METHODOLOGY
In our discussion we have stressed on the secondary results of the researches on global green financing. We have taken an attempt through our works to initiate green finance in the developing countries. Every society need green finance for the eco-friendly business. The populations of the world growing rapidly and for this large population we need green finance to make the earth as a living place of the all species of organisms.

4. WHAT IS GREEN?
In 2010, a report on environmental claims made in the North American market and the researchers expressed that green is a difficult word (Defining Green Products 2010). The complicating matters is the widespread use of terms such as natural, organic, planet-friendly, earth-friendly, ecological, non-toxic, biodegradable, plant-based, chlorine-free, and 100% compostable, which consumers erroneously assume are synonymous with green (TerraChoice 2009). It is no wonder that every company has a green story. The development and offering of green products and services positively impact consumer and investor perceptions of a company and it also improve the bottom line of the company (Mohajan 2012a, b).
5. DEFINITION OF GREEN FINANCE

There is no standard definition of green financing. Green finance defines as financial support for green growth which reduces greenhouse gases (GHGs) and air pollutant emissions significantly. Green growth indicates as growth make through the harmony between the economy and the environment. Finance in industrial and economic advancements with the reduction of green house gas emissions and other environment pollutions is green finance. Green growth is the solution to three current threats to the global economy; namely, climate change, energy constraints and financial crisis. Green finance faces a wide-ranging challenge to the traditional constructs of financial law in every country. In the 1990s environmental considerations have started to play a bigger role in the field of project finance, influencing and shaping the organizational routines governing lending decisions.

Green finance covers the improvement of the areas of environmental degradation, such as, air pollution, water pollution and scarcity, infringement of rivers, improper disposal of industrial medical and house-hold waste, deforestation, loss of open space and loss of biodiversity. It must be eco-friendly and can contribute to poverty alleviation.

The Clean Development Mechanism (CDM), means reducing GHGs through eco-friendly technologies and obtaining carbon emission reductions that can be traded for earning carbon credits. It is a co-operative mechanism established under the Kyoto Protocol-1997, has the potential to assist developing countries in achieving sustainable development by promoting environment friendly investment from industrialized country governments and businesses (Chaudhary and Bhattacharyya 2006). Financing in CDM projects is also a green finance.

For green financing the following strategies are needed (Opportunities in Green Finance 2009):

- allocate policy environment for promoting investment,
- increase of public and private investment,
- identify suitable projects for green finance,
- identify the issues and approaches for green finance, and
- the role of various agencies in promoting green finance.

6. GREEN PROJECTS

According to Opportunities in Green Finance (2009) some of the green projects where green financing opportunities have are as follows:

- Renewable energy projects, such as, solar power based equipments like solar pump, solar home light, solar street light, desalination plant, geo-thermal energy, biomass based power etc.
- Fuel substitution, such as, coal to oil to gas to hydrogen in power plants, manufacturing process industries, automobiles. Fuel shift from natural gas to compressed natural gas (CNG) or Liquefied petroleum gas (LPG) in the transport sector and related equipment finance.
- Energy from biomass, such as, biofuels from rice husk, sugarcane bagasse, molasses waste etc.
- Cultivation for biofuels, agriforestry.
- Fuel efficient equipments.
- Energy efficiency improvement and waste heat utilization projects.
- Recycling of waste vermacompost, compost from sericulture waste/cocoons, paper, coconut fibre, cloth/yarn, jute wastes, garments waste.
- Rain water harvesting by rooftops, farm pond.
- Soil conservation/watershed structures-On-farm development, contour binding, bench terracing.
- Carbon sequestration projects like horticulture and forestry, social forestry, afforestation.
- Green housing/habitat-Rain water harvesting, waste management, renewable/solar energized, sanitation, eco-friendly material.
- Biofertiliser/biopesticide, Rhizobium, Azotobactor, Azolla, Tricoderma, Tricogramma.
- Green microfinance.
- Improved Jute retting technology.
- Cultivation of and use of eco-friendly material/handicraft-Jute.
- Finance projects which address conservation issues-prawn hatchery, fish seed preparation, ornamental fisheries.
- Cultivation of aromatic and medicinal plants.
- Rural and eco-tourism.
- Bee keeping.
- Integrated farming models.
- Other project and activities that reduce anthropogenic emissions by sources, management of methane emissions from municipal landfills, management of methane emissions from agriculture and cattle manure management.

7. GREEN FINANCE IN AGRICULTURE

Global warming and climate change has created uncertainties in the bumper production in agriculture. In the traditional farming yields of low returns, so that, agriculture sector has not attracted adequate investments. As a result educated and young generation prefers jobs than engage themselves in cultivation. If the modern technologies and financing be increased in agriculture for the maximum output in cultivation, then young generation will develop the farming and yields much than a job gives. Increase of finance in irrigation during the dry season the production of crops can be increased. Farmers would be trained in modern farming practices to adopt improved package and practices.
Financing in poultry farm and hatcheries, the deficit of protein can be increased. Unemployed young people can find sufficient benefits if the financing is increased in these sectors. Government, various non-government organizations (NGOs) and microfinance institutions can provide loan facilities with low interest rate in agriculture sector and can contribute in the development of the country.

Financing in pisciculture can increase the production of fishes in the paddy fields, small and larger ponds, and farmers increase their income. The financial institutions can increase their incomes by the green financing than the investment in conventional ways, because financing in these sectors has low risk.

Agriculture and rural development activities like forestry, agriculture and other land use activities, viz., dairy, soil conservation, energy use practices, use of renewable energy, etc. have tremendous potential for reducing emission of greenhouse gases (GHGs).

8. GREEN FINANCE IN BANKING SECTOR

Banks hold a pioneer role in an economic system which affects production, business and other economic activities through their financing activities. In the last two decades of the 20th century and the beginning of the 21st century green financing has started not only among smaller alternative and cooperative banks, but also among diversified financial service providers, such as, in Retail Banks, Corporate & Investment Banks, Asset Management firms, and Insurance companies. Green finance as a part of green banking makes great contribution to the green industry and green economy and it is a component of the global initiative by a group of stakeholders to save the environment.

Banks are required to establish a separate green banking unit for the responsibility of designing, evaluating and administering related green banking issues of the bank. Banks must ensure about protection of environmental pollution while financing in a new project or providing working capital to the existing enterprises. Eco friendly business activities and energy efficient industries will be given preference in financing by bank.

Banks should finance in solar energy, bio-gas, Effluent Treatment Plant (ETP) and Hybrid Hoffman Kiln (HHK) in brick field. Bank can finance loan facilities in environmental infrastructure, such as, renewable energy project, clean water supply project, wastewater treatment plant, solid and hazardous waste disposal plant, bio-gas plant; bio-fertilizer plant should be encouraged. Bank should finance the environmental activities of the flood, cyclone and drought prone areas at the regular interest rate without charging additional risk premium.

The aims of green financing bank will be as follows:
- the banks will prepare a policy and a strategic plan to finance green projects,
- awareness creation and capacity building of staff about green finance,
- disseminate information about green projects, project profiles, unit costs etc.,
- create awareness among potential entrepreneurs,
- identify suitable projects,
- facilitate preparation of project and consider End to End solutions/ advisory role,
- finance green projects,
- set up bio carbon funds,
- transfer proceeds to entrepreneur/share proceeds, and
- earn themselves C-credit by funding green projects.

The government of every country of the world should take attempts to the establishment of independent Green Investment Bank (GIB), which only provides loan to the green entrepreneurs. Green banks not only improve their own standards but also affect socially responsible behavior of other business for the sustainable banking practices.

Bank can also finance to cultivate salinity resistant crops in the salty areas; water resistant crops in the water locked and flood prone areas, drought resistant crops in the drought prone areas, using surface water instead of underground water for irrigation and also using organic fertilizer, insecticides by natural means instead of using chemical fertilizer and pesticides. Banks can also provide loan facilities to green building projects.

9. GREEN FINANCIAL PRODUCTS

Green financial products and service opportunities vary across the sectors and markets. The features of these products are as follows:
- Improved market shares efficiently. As green financing products are of good quality, so that they continuously creates demand in markets.
- Increase profits in the business. Majority of customers choice green products, so that both producers and sellers find satisfied benefit from the green financial products.
- Environment awareness and benefits are created. A relatively high degree of environmental awareness and government support for environmental sustainability in Europe has driven ever-growing consumer demand for eco-friendly products and services.
- Improved the image of the various brands. Most of the consumers’ choices are the brand products which come from green financing.
- Positive media attentions are created. Higher levels of media coverage about green financial issues, along with multinational environmental campaigns and outreach initiatives have helped improve the general public’s understanding of the issues.
- Create higher employee satisfaction and maintenance. Since employees in green financing factories find satisfied salaries, bonus etc. and accommodation of workplace is healthy, so that efficient and healthy workers provide maximum production in the market.
- Improved license to operate green financing. The green financing products have higher demand in the world markets; as a result government improves the license of the green financing projects.
- Increase customer acquisition and loyalty. Products of green financing are durable and smart, so that, customers have faith in these products and read to pay premium price for the purchasing of green products.
- Strengthened relationships and partnership with external stakeholders. As external stakeholders find maximum satisfaction for the products of green financing, they are eager to create relationships and partnership in the green financing producers.

10. FINANCING IN GREEN MARKETING PROJECTS
Green marketing incorporates a broad range of activities such as the product modification, changes to the production process, packaging changes, as well as modifying advertising of the environment friendly commodities. The terms like phosphate free, recyclable, refillable, ozone friendly and environmentally friendly are some of the things consumers most often associate with green marketing. But green marketing incorporates a broad range of activities such as the product modification, changes to the production process, packaging changes, as well as modifying advertising which can be applied to consumer goods, industrial goods and even services (Welling and Chavan 2010).

Green marketing is very important item for a company because it offers business bottom line incentives and top line growth possibilities. Companies can develop new and improved products and services with environmental impacts which help access to new markets, substantially increase profits and enjoy competitive advantages (Mohajan 2012b). The term green marketing refers to the planning, development and promotion of products or services that satisfy the needs of consumers for quality, output, accessible prices and service, without however a negative effect on the environment, with regard to the use of raw material, the consumption of energy etc. (Peattie and Crane 2005, Grant 2008, Pride and Ferrell 2008).

In the 21st century consumers become more conscious about their safer and healthier lives and healthy environment. Obviously the customers always want to buy eco-friendly and environment harmless commodities for their daily lives. Hence financing in green marketing should be increased.

11. FINANCE IN GREEN BUILDINGS

In the 21st century interest in green building is growing. The populations of the world have been growing at steady rates for the past three decades, which creates stable and steady housing demand. Agricultural lands and lands for livestock are decreasing for new homes, educational institutions, roads, offices and parks. As a result conventional buildings are not providing sufficient eco-friendly and energy saving equipments.

Green buildings have minimum energy efficiency, water conservation, indoor air quality, and waste recycling standards etc. Not all the municipalities of the world developed the green building policies, but the increasing acceptance of green building practices in many cities is reflected in the adoption of policies by cities, counties, and states.

The United States Green Building Council (USGBC), a national non-profit membership organization, the Leadership in Energy and Environmental Design (LEED) and the Tokyo Green Building Program (TGBP) of Japan provide a guideline and rating system for green buildings. The goal of the TGBP is to encourage building owners to carry out voluntary environment conscious efforts and create a more environmentally emerging market with high quality buildings and structures. The founder of LEED, describes green building as the “design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas such as sustainable site planning, safeguarding water and water efficiency, energy efficiency and renewable energy, conservation of materials and resources, and indoor environmental quality” (USGBC 2001). The fields for the idealization of green buildings are as follows (Yoshida and Sugiuira 2011, Opportunities in Green Finance 2009):

- Reduction of thermal loads, such as, proper designing of the envelope of the building to reduce its heat load and use of spectral selective glasses for structural glazing and heat reflective walls, roofs, floors, and windows for the building.
- Use of renewable energy, such as, use of natural light, photovoltaic power generation, wind power generation, solar thermal system, and other renewable energy.
- Indoor environmental quality, for example, maintaining indoor thermal and visual comfort, and air quality.
- Maximum use of onsite sources and sinks like by bio climatic architectural practices.
- Using the natural resources available at site like trees as natural sun sheds to the advantage of the building and use excavated earth for landscaping.
- Energy saving, such as, use of energy efficient equipment for water heating, floor heating, ventilation, and air conditioning.
- The landscape design to supplement the proposed solar passive structures for the building, thus reducing the overall heat load of the building including developing small artificial water bodies which creates local air flow, thus making air natural cooling of the building.
- Use of eco-friendly materials, such as, use of recycled aggregates in concrete, blended cement (e.g., blast-furnace slag coarse cement), recycled steel, and other recycled building materials.
- Using locally available products also saves money and helps the environment, avoiding the effects of a long supply chain thus reducing the emissions due to transport and lesser carbon foot prints.
- Use of rain water harvesting structures to charge the aquifer and use of stored water.
- Use of techniques like vermicompost as a waste recycling strategy.
- Long-life design of the building, such as, flexible structure enabling easy maintenance, renovation, and conversion (e.g., configuration of plumbing, beams, floor height, etc.); physical durability (e.g., quality of cement, the covering depth of reinforced concrete, and exterior material).
- Maximize use of renewable energy sources, specially use of solar power for electricity with solar panels mounted on the roofs, thus effecting dual benefit of generation of electricity as well as low heat transfer to the roof slab.
- Water circulation, such as, circulation of rain and waste water by on-site sewage treatment; using rainfall infiltration.
- Recycling water from washrooms for watering the plants and lawns in the garden. To minimize the wastage of water through controlled water flushing system and recycling through sewage treatment plant.
- Planting, such as, a larger area of planting, planting on the wall and roof of building, optimal mix of shrub and arbor, coordination with surrounding green areas, attention to the local eco-system.
- Mitigation of the urban heat island phenomenon, such as, covering ground by plants, water, or materials with water retention capability; covering building walls and roofs by plants, water, materials with water retention capability, or high-reflectivity coating; shape and configuration of buildings to improve wind flows.
- Use minimum energy to power the building with energy efficient intelligent lighting, heating, ventilation and air-conditioning system.
The definition of green buildings differs by evaluation system, for example, by energy efficiency, by a combination of various sustainability factors etc. Green buildings sometimes called sustainable buildings. Green buildings use resources, such as, energy, water, materials, and land more efficiently than buildings that are just built conventionally. These buildings have enough natural light and better air quality, hygienic, and comfort. Massachusetts is a leading state in the USA where green buildings are growing rapidly. These buildings consume 70% of the nation’s electricity and a large part of the materials, water and waste used.

In all green building manufacturing the raw materials are timbers from sustainable managed forests (Mohajan 2012b). According to United Nations Economic Commission for Europe (UNECE), and Food and Agriculture Organization (FAO) (2008) the policy of promotion of green buildings contributes to the continuously stronger support of timber certified products from certified forest regions. Most of the cities are (e.g. San Francisco) adopting green building regulations, from mandating LEED standards in government buildings to set the standards for all large development.

Benefits of green buildings are many and some of them are, they consume 30–60% less electricity, use renewable energy sources, consume 40–80% less water, less waste or pollutant generation and optimum use of waste by reuse and recycling, cost of implementation of green energy about 10–20% of total cost.

The hedonic pricing method is based on the basis that the value of a good or service can be decomposed into specific benefits. In the real estate literature, hedonic methods have been used to study a wide range of attributes including school districts (Walden 1990), conservation districts (Diaz et al. 2008), and age-restricted and gated communities (Aslin 1997), Boyle and Kiel (2001) evaluated 30 hedonic price studies organized into air pollution, water quality, undesirable lands uses, and multiple pollution sources.

The costs of construction of green buildings are more expensive than conventional buildings due to the increased architectural and engineering design time, modeling costs and time necessary to integrate sustainable building practices into projects. In recent years the construction of green buildings has increased because they emit less carbon dioxide (CO2).

Green buildings increased ventilation control, increased temperature control, increased lighting control and increased day lighting. These buildings give more financial benefits than the conventional buildings provide. For example, they save energy and water, improve indoor environmental quality, greater employee productivity, reduce waste, reduced employee health costs and lower operations and maintenance costs. On average, green buildings use 30% less energy than conventional buildings (Kats 2003).

In an average an individual spends 90% of one’s time indoors and the concentration of pollutants indoors is obviously higher than outdoors. As a result the citizens of conventional building become sicker than citizens of green buildings and have to spend more money for treatment. The green buildings reduced illness symptoms, reduced absenteeism in workplace and increases productivity of a factory.

Conventional commercial buildings are prepared by poor indoor environmental quality (IEQ). In these buildings workers can work more efficiently and they remain healthier than that work in the conventional buildings. There is a positive correlation between workers’ comfort and productivity in the factory. The green commercial buildings reduced illness symptoms, reduced absenteeism and increases spirit of productivity of the workers.

If green buildings are traded at sufficiently high prices, developers will build such buildings for profit, that is, the green finance in construction sector will increase.

12. FINANCING IN RENEWABLE ENERGY

Due to global warming the use of renewable energy is increasing day by day. In the last decade renewable energy market success has been driven by political support. At least ten countries of the world now have sizeable domestic markets of solar energy. Wind power energy growth increased over the last decade; global installed capacity at the end of 2010 was around 194 Giga watts (GW), up from 17 GW at the end of the year 2000. But worldwide renewable electricity generation since 1990 grew an average of 2.7% per year. About 19.5% of global electricity in 1990 was produced from renewable sources; which fell to 18.5% in 2008, due to slow growth of the main renewable source, hydroelectric power, in the Organisation for Economic Co-operation and Development (OECD) countries (IEA 2011).

By 2011, at least 118 countries had policies to support renewable energy investment but implementation is very low (REN 21, 2011). Failures of attempts of implementation of renewable energy are as follows (The Clean Energy Finance Corporation, CEFC 2011):

- political regulatory risks,
- commercial lending limits,
- confidence gaps, and
- the cost of carbon pollution not yet being considered by energy companies among others.

The US Department of Energy Loan Guarantees is a highly successful program that has supported $38 billion of investment in low carbon pollution energy and cleaner vehicle manufacturing which created 60,000 jobs.

The benefits of financing in the renewable energy are as follows (CEFC 2011):
- it create jobs in new and traditional sectors,
- it generate export opportunities,
- it reduce dependence on oil, coal and gas, and exposure to their volatile prices, and
- it cut carbon pollution,

The following countries are already using renewable energy support policies (CEFC 2011):
- The United States is currently considering a Clean Energy Deployment Agency.
- The United Kingdom is currently establishing a Green Investment Bank.
- In the Netherlands a Green Investment Corporation is under consideration.
- Scandinavia has established the Nordic Environment Finance Corporation.
- The China Development Bank Corporation has a dedicated investment arm focusing billions of dollars on a clean energy funding program.
- The Multilateral development banks, for example, the Asian Development Bank, World Bank, and the European Investment Bank have all been successfully using a similar model of financing low carbon assets for many years.

The international procedure of green financing in private and public are as follows:
In this paper we have discussed green financing and try to show that it is essential for the development of a country. Global warming is creating various problems in the economy. Scientists and environment experts believe that it is due to green house gas emissions. We have stressed that green financing will reduce green house gas emissions significantly. We have provided the usefulness of green buildings which save energy and keep healthy environment and reduce illness of the dwellers. We have emphasized to invest in renewable energy projects and other eco-friendly opportunities.

14. CONCLUSIONS

In the 21st century, for the sustainable economic and financial development, green finance become as a global concern. All the nations are anxious about change of environment and environment pollutions. For green financing we need to i) identify the possible green projects and verify them whether they are green financing or not, ii) finance to generate less waste, recycle waste into composts or other articles projects, iii) increase finance in all green projects, iv) awareness creation at grassroots level among rural populace is necessary, v) set up of green projects and facilitate replication, vi) motivate the marginal and small holder farmers to green farming, vii) plant trees where ever possible, viii) encourage developers to build green buildings, ix) finance in eco-friendly products, x) micro-finance to be increased to prudence green products with very low interest rate, and xi) finance in rain water harvesting and solar lights and other renewable energy sources.

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