



Former Seoul mayor Lee Myung- Bak transformed one of Asia's grimmest urban centres by opening up a clean waterway through the heart of the city.

have a significant effect on the price of goods around much of the world.

Forgach talked to these companies about what it could mean to them over 50 years if the canal were to close. Companies quickly saw reason to invest in the forest bonds that Forgach offered them.

He lost no time in going to the Smithsonian Institute's biodiversity research wing to get an environment impact assessment of the entire region flanking the canal carried out by their researchers.

He found that a project for afforesting the entire region and for desilting the canal in phases would cost him anything upward a quarter billion dollars. The forest bonds were meant to ensure that these costs were recovered and his company would profit from the economic value he was offering these companies on the Pacific which wanted to get their commodities across to the eastern seaboard.

Business into the future will be much the same as they have been in the past, with this one quality shift that will spell sensitivity to the planet's impending threats. As Kofi Annan said, "Do the same businesses, but do them differently" Such change will be far more discernible in the building sector in future.

The important thing to recognise in such models - as this one of Forgach - is that the entire business stems out of concern for Earth, and secures a business model that bankers will love to work on.

DOING IT RIGHT

Building management systems (BMS) have seen a sea-change at the turn of the century with companies quickly seeing the importance and need in the marketplace for systems, services, techniques, and tools that can bring operational efficiencies in a broad spectrum of utilities ranging from energy to water, from air-conditioning to waste water, to efficient sanitation systems, and water-efficient toilets. Companies have gone ahead with research and invented commercial applications which bring cost savings to businesses into buildings and building management.

More than ever, this shift in BMS has got planners, architects and builders to think of what the Japanese learnt to do so well in the 1970s: do it right the first time.

This has meant that construction businesses are changing the quality and content of their design briefs to building professionals the world over. Design today

has become so much more demanding of life-cycle cost and maintenance of the building or the envelope-which will lead to great sensitivity on natural resources while cutting running costs of buildings.

The compelling drives of economic growth excite leaders, but the dangers of mass-scale destruction that creation of projects entail, are not being recognised, not as yet. Developers are still rushing head-long into the Manhattan mode forgetting that the science of building has to seek change in the very way we think.

Skyscrapers will now turn to ground-scrappers and sub-scrappers. These will allow light, air and plant growth deep inside the developments. One architect calls these 'eco-cells' which are developed as a means of integrating the inorganic mass of the built components with the organic ecoscaping.

We will soon see algae sewage treatment water tanks that offer you 100 per cent fresh water. Nuwater in Singapore heralds another dimension that the future of building will necessarily integrate. A city like Mumbai which requires 4,500 million litres of fresh water every day can comfortably manage with 50 per cent of that volume, if every real

estate development responds to water treatment needs proactively - this will drop fresh water needs to just 2,000 million litres, or about the level that Mumbai needed in 1980!

It is hard to judge urban lifestyles. Do you battle consumption? Or do you promote sustainability? And where is the line that blurs the two challenges?

The world is showcasing answers to such questions. Kowloon in Hong Kong now sports a building that offers links to key green spaces in the district with a biodiversity corridor that winds through the island, and is home for many endemic species.

Architects are today designing green jackets with buildings placed on top, below or sandwiched between such jackets that cut into the building and slice down through all floors from the uppermost to the basement.

Design solutions will soon seek to provide environmentally sustainable urban eco-systems. This seems very do-able, especially if builders and users join hands to ensure - either by legislation or voluntarily - implementation of new building technologies for water and energy.

Cities will then become far more habitable: sewage water canals will become fresh water parks while also generating energy, landfills will morph into parks, consumers will become prosumers with consumption being a problem that the consumer will himself resolve with his own production.

Mumbai, which consumes about 2,000 megawatts, can slash its energy use by half if it implemented some very basic principles at end-use level, with greater consumer understanding, and with energy schemes that allow home-owners to 'sell' energy to the grid when they are 'energy-positive'. To get a perspective on what such a saving on energy in one Mumbai means, remember that India produces just about 1,25,000 megawatts today.

THEY COST LESS TO RUN

The future of these new buildings clearly shows that there will be greater sensitivity to what comes after people have moved into these buildings. A simple set of installations, for example, for wastewater can bring about post-occupancy cost reduction of as much as 20 per cent on maintenance. These new buildings of the next generation will cost less to run, regardless of whether they are residential, commercial or any other kind.

If one extended many of the old principles of air management and responded to them in terms of construction design with appropriate building blocks that either retain heat or reduce heat gain, depending on the latitude you belong to, such technologies can bring about a saving of a high 30 per cent on air-conditioning bills alone, let alone lighting and pumps.

You may want to take a pause on this one: a typical 20,000 sq ft envelope that is centrally air-conditioned can cost you as much as 200 kWh of power in a regular building. This can cost you as much as Rs 1,000 an hour of its functioning. At 12 hours a day, this will mean about Rs 3.5 million a month on just the AC cost! What's more, the carbon emissions per annum on just one such building will run into thousands of tons.

Are there ways of creating the building so that the total tonnage of designed air-conditioning is brought down by about a third of the regular tonnage needed? The impact on financial cost alone is so dramatically positive that there is today more than hope, in fact near certainty, that the world has reached some

kind of tipping point when it comes to such buildings or construction of the future, not because these technology directions are sensitive to the planet - that indeed they are - but because these technologies are enabling and facilitating huge financial savings for businesses.

There is a new surge of interest in green buildings: India will have in the next three years nearly 100 million square feet of such certified green residential buildings. There are, of course, challenges in execution and in securing certification for builders who want to take to these options but don't know the how-to's.

Builders, the world over, are quickly seeing the savings and added business value that such green

Bengal, Gandhiji defined his ideal village settlement. He wrote in Harijan: "It will have cottages with sufficient light and ventilation, built of a material obtainable within a radius of five miles. The cottages will have courtyards enabling householders to plant vegetables for domestic use and to house their cattle. The village lanes and streets will be free of all avoidable dust. It will have wells according to its needs and accessible to all. It will have a house of worship for all, also a common meeting place, a village common for grazing its cattle, a cooperative dairy, primary and secondary schools in which vocational education will be the central fact, and it will have panchayats for settling disputes. It will produce its own grains, vegetables

ABHINANDITA MATHUR



Kowloon in Hong Kong has community spaces which work for the aged

buildings or buildings of the future bring. That is enough incentive for the construction business to take to these values.

In a feature that discusses the future of construction we cannot omit the reality that there is dismaying damage to many ecosystems across India, and to the world beyond cities. In the urban world, our cities occupy less than two per cent of the world's landmass, have 55 per cent of us living in this small sliver of land, with 75 per cent of the world's natural resources being consumed by us. The real bad news is that this tiny landmass of urban India and its population produces over 60 per cent of the country's GDP.

WILL WE CHANGE?

Our city-dweller needs air-conditioned home spaces, offices and shelters. He wants to drive SUVs that emit greenhouse gases, fly around the world in ozone-depleting planes, consume power that comes from dams that submerge forests, and build houses of materials that originate in strip mines in distant and fragile ecosystems.

We mine soils, gut our forests, misplace our industry priorities, waste vast sums in needless transportation, congest our population in settlements that don't reckon with damages and implications of the future, and lower the physical vitality of poorer communities in our villages without immediately feeling the consequences of our actions.

In January 1937 after a visit to Birbhum in West

and fruit, and its own khadi. This is roughly my idea of a model village."

Is there a return to the past that we should reflect on, while bracing ourselves for the future?

The way we have built so far is doubly ruinous: we have steadily impoverished the earth by hastily removing resources that are millions of years old for the benefit of a few generations. Those common resources can never be restored once spent.

There has been a turn in the tide of such consciousness in the last decade which offers a happy augury for the future. Architects are beginning to see that in each geographic area a certain balance of natural resources and human settlements is possible for the land and the people.

There is a more challenging task that architects and builders have before them: their relationship has so far been fundamentally exploitative of the rest of the world. The Indian consuming world, for instance, has taken for granted the continued supply of teakwood from our own dwindling forests and from countries like Malaysia; limestone and ores from Africa, laminate floors from Australia and Europe, tiles from Italy which imports its raw materials from Africa ... All this without being in the slightest degree responsible for the environmental implications of their lifestyles.

Chandrasekhar Hariharan heads Bangalore-based BCIL, a pioneer in green buildings. The company was recently conferred the distinguished Ryutaro Hashimoto Asia-Pacific Award for 'mainstreaming sustainability'