World Demographic Trends

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A Grateful Offering...

"The power of population is indefinitely greater than the power in the earth to produce subsistence for man," wrote Thomas Robert Malthus in 1798 in his famous work *An Essay on the Principle of Population*. An Anglican clergyman and scholar of repute Malthus made the gloomy forecast that population growth would be the biggest hurdle in the way of human progress. From half a billion in the 17th century global population rose to one billion at the end of the 19th century thanks to many factors such as industrial revolution and agricultural development.

Despite two horrendous wars, the First and Second World War that took a heavy toll of human life, the growth of world population in the twentiet century was steep, especially after the second world war, registering a near seven fold increase. Interestingly the seven billionth child will be born on October 31, 2011 in India which is poised to become the world's most populous country in a few decades.

Demography has become a fascinating subject for study and research. The coming decades will witness unprecedented shifts and changes, upturns and downturns in many countries because of demographic changes resulting in huge deficits in some and dividends in others.

On this complex and extremely important subject Prof M.N. Sastri has contributed twenty informative and thought-provoking articles for the Bulletin of Centre for Policy Studies, published in all the issues from April 2, 2008 to June 2,2011. The themes covered, ranging from *Ageing Population* to *Youthquake*, from *Media* to *Migrations* and the depth of scholarship bear testimony to the 86 year old Prof M.N.Sastri's

intellectual sharpness and rigorous academic discipline. His life and work will continue to inspire not only those engaged in teaching and research but all those concerned about human wellbeing and world progress.

On his 83rd birthday on August 5,2007 twenty nine articles on energy and environment he had contributed for the CPS Bulletin from 1997 to 2007 were brought out in book form titled *The Profligate Civilisation* and released at a function in Visakhapatnam when Prof Sastri and his noble wife Mrs Sarala Sastri were felicitated. Four years after that memorable occasion CPS is now privileged to release *World Demographic Trends*, a collection of the twenty articles of Prof Sastri published in CPS Bulletin since then, on the eve of his 87th birthday. Fifty one valuable articles in all from Prof Sastri's prolific pen that have enriched the quality of the Bulletin of Centre for Policy Studies during the last fifteen years! Not easy to adequately thank him for his outstanding contribution and unfailing support for our modest effort to generate healthy debate on issues of contemporary relevance. Offering our profound gratitude to the eminent scholar-scientist I humbly invoke the grace of Lord Almighty on Prof M.N.Sastri, Smt Sarala Sastri and their family for their good health and long life. Our thanks are due to Prof M.S. Rama Murty for taking care of proof - correction and to the ever-dependable Shri M.K.Kumar of Sathyam Offset Imprints and his able assistant Smt Kiranmayi for bringing out the book in time.

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August 4, 2011

A.Prasanna Kumar
Director

Preface

For millions of years since emerging on the planet the humans have thrived in harmony with mother Nature. The 1600s saw a new cultural orientation known as modernity, created through a powerful alliance of science, technology and commerce, with ability to produce goods to satisfy their ever-growing needs, leaving them with the risk of declining quality of life. In the words of Albert Einstein, "The problems in the world today are so enormous; they cannot be solved with the level of thinking that created them." In a series of articles beginning April 2008, I have made an attempt to share with the readers of the Bulletin the information I could gather on various anthropocentric actions that have led to this impending global crisis.

I am grateful to Prof. A. Prasannakumar, Director, Centre for Policy Studies, who encouraged me in this effort and also came forward to bring out these articles in a consolidated form. I have taken this opportunity to make some editorial corrections and also incorporate new information to the extent accessible. I apologize for any inadvertent errors.

M.N. Sastri

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Introduction

"We all worry about population explosion but we don't worry about it at the right time."

- Art Hoppe

"Sweet is sleep; death is better
But it is best never to have been born."

- Anon

Scientists theorize that the earliest member of the human species evolved from the chimpanzee and appeared about two million years ago in the Great Lakes Region of Central Africa. Through several evolutionary stages, this early human species evolved into modern human beings about 40,000 years ago. This transformation also saw the multiplication, migration and dominance of the human race all the world over.

Throughout most of the human history, the world human population remained below and around 250 million (200 million in 1 AD and 260 million in 800 AD) capped by birth rates and death rates and locked in a somewhat permanent equilibrium. The only time when there was a significant decrease in the world population was during 1348-50 when bubonic plague (Black Death) wiped out at least a quarter of the European population, reducing the world population during the following fifty years. Sometime after 1650, the population growth began to show an upward trend and never looked back. The 17th century saw the population reach the half a billion mark. In the wake of the Industrial Revolution and advances in agriculture and medical science, the world population curve showed a sharp rise through the 19th century passing the one billion mark. This trend continued in the 20th century with the steepest rise occurring during the years after World War II.

Population increase follows an exponential pattern (e.g. compound interest) as against a linear pattern (e.g. simple interest). For the present discussion it is simpler to consider the exponential growth pattern in terms of doubling time or the time it takes a growing quantity to double in size. This is approximately equal to the quotient of 70 divided by the annual percent growth rate. For 99.9 percent of human history, the population doubled every 35,000 years i.e. the annual percent growth rate was 0.002 percent. Beginning 1650, the doubling period began to shrink. Between then and 1750, it was 240 years. Between 1850 and 1900, it fell to 115 years. In 1970, the doubling time shrank to mere 35 years, representing an annual growth rate of 2.1 percent. After this accelerated growth rate for more than two centuries the annual growth rate is showing a declining trend.

Demographers explain this phenomenon through classifying all societies into three stages of demographic transition. During the first stage, which characterizes the pre-modern society, both birth and death rates are high and the population grows slowly. During the second stage, living conditions improve through increased food production, public health measures such as better sanitation and mass immunization. During this stage, birth rate remains high but death rates fall and longevity rises. As a result there is a fast population growth. In the third stage, there is a desire to reduce the family size due to economic and social constraints. As a result both birth and death rates reach near equilibrium conditions but at much lower level on the path towards stabilization. The world population with a current annual growth rate of 1.14 percent, representing a doubling time of about 61

years, touched 6.6 billion mark in mid-2007. On October 31, 2011, the world will have had its seven billionth person. It is projected to reach about 9 billion by 2050 if the present trend continues. The latest UN projections (2011) that the world population will reach 10.1 billion by the turn of the century.

But there exists considerable diversity in the population growth at country level. By far the highest rates of population growth are found in Western Asia and Africa south of Sahara and South America. The populations of many countries, especially in less developed Africa, Asia and Latin America, are projected to increase markedly in the coming decades. The ten countries, which will contribute most to world population in the coming 30 years are, India (1.18 billion), China (962 million), Pakistan (318 million), Nigeria (306 million), Indonesia (239 million), USA (190 million), Brazil (189 million), Bangladesh (176 million) and Iran (153 million).

The 2011 Census figures indicate that India's population now hitting 1.21 billion, will be 1.4 billion by 2025 overtaking China's population. The Indian population grew by 181 million since 2000, while China with a population of 1.34 billion has registered a much lower rise of 73.9 million during the corresponding period. Nearly 27 million children are born every year in India and only 16 million in China. India's population is projected to peak at 1.718 billion in 2060 after which it will decline. At its peak, India will be the most populous country there has ever been or probably will ever be. China will see its population peak at 1.4 billion by 2030. From 2030 the world population will be fueled by Africa. In contrast the population growth in many developed countries (e.g. Japan and European countries) is already showing a negative trend.

This diversity in demographic trends of different countries and resource-centric lifestyles has profound economic, social and political ramifications. These relate to population size and growth, fertility and contraception, health, migration, ageing, urbanization, and accelerating resource consumption and sustainability - to mention a few. They will be considered briefly in the articles that follow.

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Ageing

"It is desirable for a man to be blotted out at his proper time. For as nature has marked the bounds of everything else, so she has marked the bounties of life. Moreover old age is the final scene, as it were, in life's drama, from which we ought to escape when it grows wearisome and certainly, when we have had our fill."

- Cicero (106- 43 BC)

We recall that that several industrialized countries have been recording below-replacement fertility rates and the developing countries also have been moving towards lower fertility rates. At the same time life expectancy at birth at the global level has increased markedly with the value of 47.5 years during 1950-55 rising to 66.5 during 2005-10. In the industrialized countries the life expectancy today averages 76 years as against 65 years in developing countries (China - 73 years and India- 64.7 years). By 2025, 26 countries will have a life expectancy of over 80 years. It will be highest in Iceland, Italy, Japan and Sweden (82 years) while China is projected to have a life expectancy of 75 years and India 71 years.

The combined demographic consequence of these phenomena has been the rise of ageing population. Today 11 percent of the world population is aged 60 years or over. This is expected to reach 22 per cent in 2050. By this year the number of persons aged 60 and above will triple from 705 million in 2007 to almost 2 billion. Also the number of older persons in the world will exceed the number of children below 15 years for the first time in history! The proportion of old people has already exceeded that of the children in the industrialized countries. By 2050 this will be double. In the less developed

countries the proportion of old people is still low (though significantly large) but will increase rapidly in the coming decades. In next 25 years the population aged 65 years and above is likely to rise by 88% - almost a million people a month- compared to an increase of 45% in the working age population.

The fastest growing age group in the world is the oldest old, those aged 80 years and older. They are currently increasing at 3.8 percent per year and comprise more than one-tenth of the total number of old persons. Today, among the elderly population, every seventh person is over 80 years. By 2050, every fifth person will be over 80 years. Many thousands of people born at the end of the twentieth century will live through the twenty-first century and see the advent of the twenty-second century. For example, France is projected to have 150,000 centenarians by 2050 compared to a mere 250 in 1950. Queen Elizabeth now sends out ten times as many congratulatory messages to centenarians in UK as she did when she came to the throne over fifty years ago.

Another trend is that not only the elderly population is rising rapidly, it is increasingly feminized. The majority of older persons are women as the female life expectancy is higher than that for men. In 2000, there were 63 million more women than men aged 60 or older. At the oldest old range of 80-100 there are two to five times more women than men. In contrast there is a female shortfall in the zero-to-age bracket!

With their health deteriorating with increasing age, older persons need greater attention from the younger members of the family. Ironically people in 50's or 60's, themselves on the verge of retirement, are increasingly finding themselves

responsible for the care of one or more close family members aged 80 and over.

Japan, one of the world's giant economies is a typical example of a country on the course of a population collapse from a shortage of young population and a surfeit of old population. With a low fertility rate of 1.32 and life expectancy of 82 years, nearly one in five Japanese is aged 65 or older and this figure will jump to more than one in three in the next three decades. At the same time the population will dip by 30 percent to 90 million. The government forecasts suggest that there will be 1.3 workers per old person by the mid-century - down from 3.3 in 2005. Faced with a shrinking labour force, companies are looking to older people as well as younger women, immigrants and even robots to maintain the country's productivity. They are even shifting the industries to countries where growth is, leaving their headquarters and R&D in Japan but producing overseas. As a result Japan will soon become just a control centre for its industrial activity. Even strategies such as, using robots instead of people to spoon-feed the elderly or to hoist them on the toilet and phone a nurse when they won't take their pills, are being explored.

A UN report says that China is on course to age faster than any other country in history. With its family planning policy the country's median age is set to shoot up from around 32 today to 39 by 2025 and at least 44 in 2040. In 2000 the percentage of China's elderly population of 60 years or above made up 11% of its total population. It has now grown to 13.3%. By 2040, this is projected to reach 28%, exceeding the population of children. Those under 16 now make up 16.9% of the total Chinese population, down from 23% in 2000. Some

Chinese demographers worry that the country will get old before it gets rich. By 2020, the average Indian will be 29 years old, compared to 37 in China. By 2030, China will be an older nation than the US, according to the US Centre for Strategic and International Studies.

India's population is also steadily ageing. Projections indicate 32.8 percent of the entire Indian population will be 50 and above by 2050. There were 141 million in 2000 in this group. Their number will cross half a billion by 2050.

According to the National Sample Survey only 4-5 percent of the aged live alone. Less than 1 percent lives in old age homes. About 11 percent of rural aged and 8 percent of urban aged live with the spouse. About 46-47 percent lives with the spouse and other relations and 33-35 percent live with their children.

Social security is crucial for the elderly in protecting their incomes, health, well-being and their dignity as citizens. But rising aged population in both industrialized and developing countries is leading to higher social security costs with a dwindling working population to support these costs. There is increasing concern - in both the developed world that became rich before it became old and the developing countries that are becoming old before becoming rich - whether social security schemes for the aged will be sustainable in the long run. With rising life expectancy the ratio of the workers to retirees is on the decline and pension schemes throughout the world are in a state of upheaval. The UN predicts that between now and 2050 the ratio of the number of retirees to active working population will rise from 24% to 45% in the rich world. Instead of four workers for each pensioner there will be only about three. A similar trend can be expected in other rapidly developing

countries too. The more resources devoted to keeping the aged in lifestyles to which they have become accustomed, the less are the resources for productive investments. Even presently the overwhelming majority of the world's population is still without some form of income security and healthcare in old age or disability. In many developing countries (e.g. India) the retirement benefits provide sustenance to only a small fraction of the population, primarily upper-income urban workers. Limited social security assistance is available in the predominant non-organized sector only through private provision for sustenance in old age, which occurs through work, limited old age pensions from the state, assistance from other family members and support from charities and Non Government Organizations.

The decline in the number of children and increase in the rise of elderly has far-reaching impact on family ties and security as there is a progressive reduction in the availability of kin on whom future generations of the elderly can rely for support. This trend may significantly impact the well-being of the older persons, especially in the developed regions where the aged look to the immediate family for support.

The well-being of the ageing population depends on the success with which economic and social sustainability can be combined into a comprehensive approach to its social security.

"I rather suspect that people generally think old age sits lightly Upon your shoulders, not because of your cheerful disposition, but because, you are rich. Wealth is known to be a great comforter."

- Plato (427? BC -347? BC) in THE REPUBLIC

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Consumerism

"He who is not contented with what he has,
would not be contented with what he would like to have."
-Socrates (469-399 BC)

"He who buys what he does not need steals from himself."
- Anon

"He, who knows he has enough, is rich"
- Lao-tze (6th Cent. BC)

"In a consumer society there are inevitably two kinds of slaves: the prisoners of addiction and the prisoners of envy."
- Ivan Illich

Culture is defined in several ways. In its broadest sense, it represents a cultivated behaviour of a group of people accumulated through beliefs, customs, morals, conventions, language, habits and any other capabilities acquired by them as members of a society and transmitted from generation to generation. Most large groups have a set of cultural traits that meet the group's needs and ensure their survival. Every culture has its own methods of obtaining food and shelter, ways to protect itself from extraneous forces. Cultures also differ within a country with factors such as climate, land forms and natural resources having influence. Religious beliefs have always influenced cultural traditions based on sustainability and enjoining the human society to look upon nature as a source of nurture and not a force to be conquered, subdued or ravaged.

The world is currently getting into the stranglehold of a new culture, "the consumer culture" or simply "consumerism." It is defined as a culture in which "the majority of consumers avidly desire goods and services that are valued for non

utilitarian reasons, such as status seeking, envy provocation and novelty seeking.", or as a "social and economic order that is based on the systematic creation and fostering of desire to purchase goods or services in ever greater amounts."

Consumer culture is nothing new. It dates back to early civilizations (Ancient Egypt, Babylon, Ancient Rome, and Indus Valley). But it was confined to the elite which formed a small part of the population. While satisfying more than their personal whim and personal greed, it underlined the exclusive status of the nobility and the professional status of the educated elite. In contrast, saving and being frugal was the norm for most of the human society, and spending on luxuries was frowned upon and considered wasteful.

A great change in consumerism arrived in the western society with the Industrial Revolution in England and parts of Europe in the wake of enormous wealth coming from the colonized countries. This had the impact of changing the meaning of wealth, and the wealth producing means. For the first time in history products were available in large quantities within the reach of virtually everyone at very low prices, ushering in an era of consumer culture or consumerism. Further boost to the consumer culture was provided by the US after the World War. The factories previously producing weapons lay idle, and the soldiers were returning with no jobs to take up. The US economists and the government decided to revive economic activity by creating a consumer ambience in which people were encouraged to accumulate and show off material wealth to the point where it defined their self-image and status in society (William Rees). Growing alongside the corporations and advertising, the consumer culture became the tour de force.

Labour saving appliances for an easier and happier life became part of people's lives in the developed societies. Advertising expanded from print media to radio, television and internet with thousands of messages telling people to buy more and more. With globalization, the developing countries also began catching up, transforming the consumer culture into a global phenomenon. Over 1.75 billion people worldwide have now come under the consumer class or a group of people pursuing lifestyles devoted to the accumulation of consumer goods. More and more people are hankering after bigger cars, bigger houses, highly processed foods and new lifestyles. Nearly half of global consumers now belong to developing countries, including 300 million in China, possibly doubling in ten years, and 125 million in India, also increasing equally rapidly.

Globalization has now made available the goods and services which were earlier considered luxuries and previously out of reach in developing countries. These include televisions, cell phones, computers, air conditioning, refrigerators, microwave ovens, automobiles, personal care products and processed foods. Governments tell their people that the economy is dependent on consumption and that the road to economic progress is for the people to become good consumers. Governments also reinforce consumer culture by providing subsidies to consumer industries in the name of development. As a consequence, between 1950 and 2005, metal production grew six-fold, oil consumption eight-fold and natural gas consumption fourteen-fold. Experts say that many metals, especially the rare metals such as gallium, indium, platinum and hafnium that go into the consumer gadgets will run short within the next decade. In some cases there is more of some rare metals already in use than are left in the ground. Even the

output of the abundant metals, such as aluminium, copper, iron, zinc and lead would have to increase three to nine times their current levels to meet the consumer needs of the world population. One ton of earth is dug for securing one carat (200 milligrams) of diamond. Vast swathes of land are cleared every day across the globe to source the minerals and other resources to produce consumer goods to meet the accelerating demand. About 60 billion tons of earth resources are now extracted annually - about 30 per cent more than 30 years ago. Today the average European uses 43 kilograms of resources daily, while the average American uses 88 kilograms. All in all, the world extracts resources equivalent of 112 Empire State Buildings from the earth each single day. In 2008 alone, people around the world purchased 68 million vehicles, 85 million refrigerators, 297 computers and 1.2 billion cell phones. Every material item we consume comes out of the earth. This has environmental implications in terms of global warming, landfills, pollution and depleting finite resources. Such explosion of consumerism is unsustainable and will lead to major ecological disaster.

For a long time China was known as a country of bicycles. About 25 years ago there were barely any private cars in China. By 2000 there were 5 million cars and the number of all automobiles has now increased to well over 150 million (including about 25 million private cars) by 2005. By 2040 this number is projected to surpass US. In India the number of automobiles in 1950 was 300,000. By 2006 the number rose to 89.6 million. The world automobile count now stands at over 750 million. There are 4.6 billion cell phones in the world. India has over 800 million cell phones (765 million in China and 285 million in US) and this number is expected to grow to 1 billion

by 2015. Ironically, sanitation facilities are available to only 366 million or 31% of India's population. China has over 12 million computer users while India has about 5 million. There are 400 million TVs in China as compared to 63 million in India.

The advertising industry in all its multilayered sophistication is creating dissatisfaction with what people have and what they look like, what their life is about, turning them into ready consumers of newer gadgets and lifestyle enhancement products. Before advertising, people never had the urge to go shopping for new cars, gadgets, clothes or trendy shoes. Their desires were more closely tied to their needs such as food, shelter, and basic transportation. Advertising in the media through hundreds or even thousands of symbols of different consumer brands has magnified the shopping desires among people, especially among the growing urban middle class even at subconscious level. The consumer industrial complex of designers, advertisers, event organizers, psychologists and retail experts send mixed signals to consumers by blurring the line between luxuries and necessities. Through indoctrination of the concept of obsolescence, consumers are encouraged to continuously purchase new appliances and clothes to replace outdated or out of style items. Confused by the plethora of half truths and false claims in the advertisements, consumers are finding it increasingly difficult to separate fact from fantasy, especially in food and personal care products. In the 1960s, typically only one family member needed to work in order to support the family. Today, most urban families need two wage earners to meet the family's consumer needs. Sociologists aver that this trend could have adverse impact on the upbringing of children. Worldwide the annual expenditure on cosmetics totals

US $18 billion. A report by the British Chamber of Commerce says that China is currently the fastest growing and second largest luxury goods market in the world, next only to Japan, and is expected to reach the top spot by as early as 2015. In 2009, Chinese consumers purchased 27.5% of the world's luxury goods worth US $9.4 billion, in comparison to 2004 when the total was only US $2 billion. Not only the womenfolk but men also are increasingly using cosmetics under the influence of advertising. Many of the religious holidays (e.g. Christmas, Diwali) have become more oriented towards consumer gift exchange and socializing.

Advertising is also spurring on people to compete with their neighbours in accumulating material goods, fostering what is known as the "Keeping up with the Joneses" syndrome. With credit liberalized through installment payments and credit access, people are becoming more and more debt-ridden and becoming addicted to the lifestyles of the rich and famous, sometimes even at the cost of family and friends. Thanks to globalization, consumerism has become the biggest religion of the developed and rapidly developing economies. Rising globe-trotting, through popular holiday travel and business travel involving flights and chain hotels, has become part of the chain of consumerism and environmental degradation. In several situations this addiction has turned into affluenza, a concept described as painful, contagious, and socially transmitted condition of overload, debt, anxiety and waste resulting from dogged pursuit of more and more consumerism.

Advertising media are playing a profound role in bringing about rapid changes in the world of fashions. Earlier, James Laver (1899-1975) propounded a time frame for fashions,

known as Laver's Law on Consumerism. According to this Law, a fashion is considered to be

Indecent - 10 years before its time
Shameless - 5 years before its time
Daring - 1 year before its time
Smart - Currently
Dowdy - 1 year after its time
Hideous - 10 years after its time
Ridiculous - 20 years after its time
Amusing - 30 years after its time
Quaint - 50 years after its time
Charming - 20 years after its time
Romantic - 20 years after its time
Beautiful - 150 years after its time.

With the rapidly changing face of the fashion world, this time scale is now highly shortened. What was considered a fashion today becomes obsolete in a few weeks.

Children, more than adults, are impacted by a large number of TV commercials promoting processed foods, confectionaries, soft drinks with potential adverse health effects such as lethargy, obesity, diabetes, liver failure and poor concentration. According to one study, four Indian TV channels for children aired a total of 44,887 processed food advertisements in April 2010 alone. McDonalds, the fast foods chain, runs more than 30,000 local restaurants catering fast foods to nearly 30 million people in 119 countries each day. The Internet domain is becoming an obsession for people, specially the teens, for exchange of information on fashions, socializing etc. Several fashions have become a threat to animal species such as snakes, sharks, crocodiles, tigers, Tibetan antelopes,

rhinoceros and plume birds, whose body parts have become the components of the fashion merchandise.

Consumerism has also some downside effects. Many young people are turning to crime as the easiest means to get hold of the goods they desire. Corrupt practices which were inconceivable earlier have been on the rise. The rise in consumerism is also tearing the social fabric of the society by weakening the traditional bonds of kinship. In traditional societies people rely on each other and one person's problems are shared among many as in a joint family or a rural environment. But with the break-up of families in the consumer economy, the traditional bondages are coming under stress. The consumer society encourages unhealthy competition in lifestyles which often prove detrimental to the well being of people through causing depression or depressive thoughts when they find themselves inadequately equipped with all the latest fashions and gadgets.

Pope Benedict XVI recently warned, "The present consumerist culture tends to flatten man to the present, to make him lose the sense of past, of history; but in this way it also deprives him of the capacity to understand himself, to perceive problems and to build tomorrow." About five centuries ago, Ibn Khaldun (1332-1406), the Arab historian and sociologist alerted "……..when prosperity and luxury come to a people, they are followed by excessive consumption and extravagance, with which human soul itself is undermined, both in its worldly well-being and its spiritual life,"

The answer to consumerism lies in India's traditions, many of which emphasize harmony with nature and self denial. The Gita says, "That person who lives completely free from desires without longing, attains peace." (11.7).

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Corruption

"Corruption is like a ball of snow.
Once it's set rolling it must increase."

- Charles Caleb Colton (1780-1832)

"Behind every great fortune there is a crime."

- Honor? de Balzac (1799-1850)

"Corruption, like poison in a jar of fruit
Seeps down from the top -
Unseen, tainting as it touches
Until we must discard it all -
For who can tell by sight or smell
Which fruit is good
Which will make us ill——"

- Nan Witcomb

Corruption is termed as impairment of integrity, virtue or moral principles; depravity, decay and/or inducements to do wrong by improper or unlawful means; and a departure from what is pure. It is a worldwide phenomenon, which essentially involves the abuse of public power for private benefits, usually in the form of bribery. Corruption also distorts the basics of competition by misallocating resources and slowing economic growth. For our present discussion corruption can be broadly classified as Political Corruption and Corporate Corruption.

Political corruption leads to dysfunction of a political system or institution in which government officials; politicians seek illegal gratification, personal gain through actions such as bribery, extortion, cronyism, nepotism, patronage, graft and embezzlement. Practically every day there are reports of political corruption of some nature. Some notable examples are: The Mundhra scandal (1954), The US Watergate scandal

(1974), The Bofors scandal (1980's); Indian Bank scam (1992), Barak Missile scandal (2001), Stock Market scam (2001); UTI scam (2001), Stamp paper scam (2003), Oil for Food Programme scam (2005); Cash for queries (2008); Cash for votes (2008); and Peru oil scandal (2008).

Corruption is a part of public life worldwide. Rod Blagojevich, Governor of Illinois, US, was impeached for the corrupt act of selling President Obama's Senate seat to the highest bidder. A scandal tainted minister in Japan's cabinet committed suicide in 2007. Roh Moo-hyun, a former President of South Korea was driven to suicide humiliated by bribery allegations. A former Prime minister of Bangladesh is behind the bars facing graft charges. Members of the British Parliament have been found guilty of wrongfully billing the state exchequer for big and mundane expenses, from refurbishing second homes to buying toilet seats and bathrobes. Chen Shui-bian, President of Taiwan (2002-2008) and his wife were sentenced to life imprisonment in September 2009 on charges of corruption. A former Union Minister (Telecommunications) of India was convicted for bribery. A former Chief Minister of Jharkhand state is currently under investigation for alleged money laundering to the extent of Rs.300 billion. Nearly a quarter of the outgoing members of India's 14th Lok Sabha face charges like human trafficking, embezzlement and extortion. The recently constituted 15th Lok Sabha contains 22 more! The US Federal Bureau of Investigation recently arrested 44 people including assembly members, officials and rabbis in New Jersey on charges of political corruption, money laundering and human organ sales involving millions of dollars.

Several heads of states are alleged to have appropriated

huge amounts from the state exchequers. Some examples are: General Suharto of Indonesia (US$15-35 billion); Ferdinand Marcos of Philippines (US$ 5-10 billion); Mobutu Sese Seko of Zaire (US$ 5 billion); Sani Abacha of Nigeria (US$ 3-5 billion); S.Milosevic of Serbia/Yugoslavia (US$ 300-800 million) and Alberto Fujimaro of Peru (US$ 600 million).

In December 1994, the Summit of 34 heads of American nations, held in Miami, Florida, signed an international agreement to stop corruption. Fifteen years later almost a dozen who signed this anti-corruption pact are in prison under indictments of corruption. From Panama to Peru and Paraguay, many Western Hemisphere Presidents have been battling accusations of embezzlement and money laundering.

Political corruption, apart from amassing personal wealth, is resorted to for the purpose of preserving power through buying of individual politicians to build majority and secure specific policy decisions, manipulation of elections and buying of voters and manipulation of various institutions rich with resources or having oversight and control. Reconciling the presence of money in politics poses a big challenge to democratic values and good governance. Political corruption impedes economic growth, distorts inflow of investment, and works to keep large scale projects in the public sector even if they are unproductive. Its impact is felt more by the countries with scarce resources and the poor sections of the society. Corrupt leaders make poor people poorer and deprive them of basic needs like food, water, housing, power they need. It acts as a mechanism to subvert democracy and popular participation, breeding cynicism, distrust and apathy, thus undermining the legitimacy of state institutions.

Corporate corruption involves the abuse of power by corporate managers against shareholders or consumers. Numerous cases of corporate corruption, minor and major, are reported practically every day. The collapse in 2001 of US giant energy firm Enron, which grew to be the seventh largest in America was the result of fabrication of accounts, fudging of profits as well as a range of shady dealings. Bernard Madoff (US) robbed 5,500 credulous clients of more than US $50 billion through his Ponzi scheme (a fraudulent investment operation that pays returns to investors from their own money or money paid by subsequent investors rather than from any profit earned) dating as far back as the 1980. He was convicted and sentenced to imprisonment for 150 years. The recent US financial meltdown, starting with the bankruptcy of the Lehman Brothers and other banking institutions was the result of the breakdown of corporate and personal responsibility, government regulation and financial ethics. A recent US study showed that two-thirds of the US corporations paid no federal income taxes between 1998 and 2005 and about 68 per cent of the foreign companies doing business in the US avoided corporate taxes over the same period. In 2001, Britain's banking regulator found that 23 banks in London had handled US$ 1.3 billion of the US$ 3-5 billion looted by Sani Abacha of Nigeria. Five years ago, Riggs Bank collapsed after it was revealed that Augusto Pinochet of Chile and Obiang Nguema of Equatorial New Guinea had stashed millions of state funds in private accounts. Three African Presidents, Omar Bongo of Gabon, Denis Sassou-Nguessi of Congo Republic and Teodore Ngeume of Equatorial Guinea are arraigned for alleged embezzlement of public funds for buying luxury house and cars in France. A study released in August 2009 says that for the past eight years, the US aid money

funded corruption in the Pakistani Army and Intelligence Service and enriched Pakistani individuals at the expense of the proper functioning of the Pakistani institutions.

The Satyam Computers scandal, called the Indian Enron scandal, is the biggest-ever corporate fraud in the history of India. This was the result of inflated profit figures, fudging of accounts and money laundering. A recently conducted study by the Pune-based India Forensic Consultancy Services, reports that at least 1,200 companies out of 4,867 companies listed in the Bombay Stock Exchange and 1,288 listed in the National Stock Exchange, including 25-30 companies listed in the benchmark Sensex and Nifty indices, have "massaged" their financial statements. The KPMG India Fraud Survey Report of 2008 indicates that such frauds will increase over the coming years. The beneficiaries of a fraud are those responsible for the fraud itself. They include the personnel department of the accounts departments of the companies, auditors and the concerned directors of the companies who are in the know of things, all at the cost of the investors. India loses a great deal of tax money as firms and individuals avoid paying taxes of billions of rupees. Pratyush Sinha, a former boss of Anti-Graft Mission India lamented,

"Increasingly materialistic Indians are becoming utterly corrupt."

The ill gotten wealth is stashed away by individuals and corporate bodies in tax havens the world over. These tax haven are located in Switzerland, Cayman Islands, Gibraltar, Antigua and Barbados, Turks and Caicos Islands, Niue (South Pacific), Mauritius, Maldives, Singapore, Panama, San Marino,

Liechtenstein, Guernsey (English Channel), Cyprus, Cook Islands, Bermuda, St Vincent and the Grenadines, Netherland Antilles, Malta, Liberia and Seychelles (to mention a few). About 60 per cent of world trade is routed through these tax havens. Between 2002 and 2006 over US$ 3 trillion moved into tax havens from developing countries. In the same period India lost over US$ 115 billion a year (Rs.1.1 lakh crores), the amount exceeding the total annual expenditure on health, education and internal security. Estimates of total global offshore wealth range from US$ 5 to 11.5 trillion. Indian firms and individuals are alleged to have stashed Rs.70 lakh crores in Swiss and other banks in secret accounts in these banks. About Rs.25 lakh crores out of this amount are suspected to be held in secret accounts in Swiss and Liechtenstein bank accounts. Global Financial Integrity, an American think-tank, suggested that since 1948, India lost over US $460 billion in illicit financial flows.

The judiciary which metes out justice in disputes is not free from corruption either. The Global Corruption Report-2007 arrived at the percentage of respondents who interacted with the judiciary during 2003 and had paid bribes. Region-wise these percentage values are: Africa – 21; Latin America - 18; newly independent states of Moldova, Russia and Ukraine – 15; SE Europe-9; Asia-Pacific including India and Pakistan - 15; EU and Western European countries – 1; and North America – 2.

The noble profession of education also is also tainted with corruption scandals. According to a report in August 2009 professors at a dozen universities throughout in Germany are alleged to have pocketed between 4,000 and 20,000 Euros to help students obtain their doctorate degrees. One professor was

sentenced to three years' imprisonment for accepting 184,000 Euros from 69 students.

There are several instances of pharmaceutical companies clearly acting in an unethical manner by releasing a product which is potentially dangerous, affecting the health of the public. Instances also abound of individual drug companies influencing, even financing, publication of research results that promote their financial interests. The unethical interaction between the medical profession and pharmaceutical industry leading to conflict of interest between the physicians' duties to the patient and the pharmaceutical industry's yearning to sell their products is well known.

Transparency International is a global civil society organization fighting corruption. Drawing on different expert and business surveys, this organization prepares every year a Corruption Perception Index (CPI), which is a measure of the perceived levels of public sector corruption in a given nation. The CPI-2008 covers 180 countries on a scale from Zero (highly corrupt) to ten (highly clean). The cleanest nation is Denmark with a score of 9.3 while Singapore with a score of 9.2 comes fourth. India with a score of 3.4 gets rank 85 along with Madagascar. The ranks of some Asian countries are: Japan – 18: China-72; Thailand-80: Sri Lanka – 92; Nepal – 121; Indonesia – 126; Pakistan 134; Philippines – 141: Russia 147 and Myanmar – 178. Somalia with a score of 1.0 gets the lowest rank.

A report of the Carnegie Foundation says that failure to contain the endemic corruption among officials poses one of the serious threats to the China's future economic and political

stability. President Hu Jintao has acknowledged that corruption is one of the greatest threats to the legitimacy of the ruling Communist Party. The Chinese Government has launched a battle against rampant corruption. Some 881,000 Chinese officials have been punished over the past five years for acts of corruption and other law-breaking activities. One accused was also executed. The country's top auditors recovered about US$ 4 billion embezzled in 2007. Frequent crackdowns and the occasional toppling of sleazy officials appear to have little impact.

In India corruption is rampant in all walks of life. Corruption has become such a part of India's culture that the public have become resigned to it. Interestingly the Chief Economic Advisor to the Government of India wants to legalize some forms of bribe-giving! Throughout the country, municipal and other government officials, elected politicians, real estate developers and law enforcement official acquire, develop and sell land in illegal ways. Many state-funded construction activities in India, such as mining, road-building, dam construction, are dominated by the construction mafias, conspiring corrupt public works officials, materials suppliers and politicians. Mr. C. Rajagopalachari, a great Indian statesman, and the Chief Minister of the Composite Madras Presidency in 1937, said, "The Public Works Department is my enemy number One"! Corruption is also rampant in the state healthcare sector, police, religious and education sectors. The diversion of expensive cancer drugs worth about Rs.One billion over a period of five years from a reputed hospital in Mumbai has recently come to light. Illegal collection of huge sums for admission into educational institutions is a common

phenomenon. The Chairman of the Medical Council of India has recently been arrested for accepting huge bribes for granting permission to admit students into medical colleges lacking in requisite infrastructure. Some office-bearers of the All India Council for Technical Education, the statutory body for overseeing technical education have been facing trial on similar charges. Religious institutions are not free from corruption (e.g. selling Baptism certificates) either. Sports are not also free from the Indian sins of corruption and nepotism. The reputation of cricket as a gentlemen's game has received a beating with the exposure of sleaze in the Indian Premier League, an ingeniously conceived and spectacularly executed cricket event popular among the Indian public. It is alleged that huge amounts have been siphoned off from the recently held Commonwealth games event. The irregular 2G auction by the Ministry of Telecommunications is reported to have led to a loss of Rs.1.6 lakh crores (US $ 39 billion) to the exchequer. This amount, equal to the defence budget, is the biggest loss to the state due to corruption in high places. One Union Cabinet Minister and several corporate executives are behind bars facing charges. The accused Minister has recently earned the dubious distinction of being ranked no.2 in the Time Magazine's list of ten most corrupt, "an ignominious club of privileged leaders who stepped to far"!

The Transparency International in collaboration with Centre for Media Studies in Delhi reports that, with 26 million cases pending across the country and a shortage of judges, the judicial system is rife with delays and inefficiencies creating ideal conditions for corrupt middlemen to step in. In 2004, 59 per cent of the respondents in various states admitted having paid bribes to lawyers, 5 per cent to judges and 30 per cent to

court officials. Corruption among top judiciary also is coming to light. Several judges of Allahabad High Court are alleged to be the beneficiaries of funds diverted from employees' PF accounts. Recently the Punjab Vigilance Bureau has brought to light the nexus between the high court judges and touts for favourable judicial orders and appointments. The political world in the country is rife with corruption

The Transparency International has also concluded in 2005 that Indians pay out an amount of Rs.210 billion every year as bribes while availing public services. This amounts to saying that "Nothing can be got done in India without paying a bribe." According to the September 2009 report of this body, at least 30 percent 0f the 2,742 business executives surveyed across the world regard Indians among the most corrupt when doing business abroad. This body's Pakistan unit reported recently that there has been an enormous rise in corruption in Pakistan-from $195 billion in 2009 to $223 billion in 2010!

Tailpiece: Sri Gulzarilal Nanda (1898-1998) (Bharatratna, 1997), Dy. Chairman, India's Planning Commission (1951), Minister for Planning (1952) and Home Minister acted as the interim Prime Minister of India on two occasions, in 1964 and 1966. He was the only Prime Minister who did not have a house of his own. He had no source of income and was so honest that he would not accept funds from any of his well wishers. A friend of his, Sri Sheelbhadra Yajee forced him to sign an application for freedom fighters' pension of Rs.500 per month, to which he was eligible. Having been evicted from a rented house in Delhi because he could not pay the rent, he moved to Ahmadabad to live with his daughter.

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Diseases

"The Earth has a skin and that skin has diseases; one of its diseases is called man."

- Friedrich Nietzsche (1844-1900)

Diseases can be broadly classified as infectious and non-infectious diseases. Infectious (also called extrinsic or communicable) diseases can spread from person to person by microscopic organisms (germs or pathogens), which include a wide variety of bacteria, viruses, protozoan and parasite bodies. Some examples are smallpox, malaria, tuberculosis, influenza and HIV/AIDS. Medical science is still struggling to grasp the causes of many devastating non-infectious and chronic disorders such as heart attack, stroke, Alzheimer's disease, schizophrenia, cancer and diabetes. Intrinsic conditions of the body as a result of hereditary conditions, dietary deficiencies and lifestyles are believed to have some influence on their incidence.

In terms of threat to human security from premature deaths, infectious diseases rank number one among the diseases. These diseases are on the rise and are killing more people worldwide as a result of unruly urbanization and the failure of governments to control the spread of pathogens in the tropical regions due to poor basic services. They are responsible for over 25 per cent of premature deaths. These diseases are also called diseases of poverty as their impact is most severe among the poorest people who live in unhygienic conditions with the lowest material, physical and financial resources and limited or no access to integrated healthcare, prevention tools and medications. The top five infectious diseases worldwide in terms of early mortalities are: Respiratory infections, HIV/AIDS, Diarrhoea

(including Cholera), Tuberculosis, and Malaria. According to a recent report more than 3,000 people died from cholera in Zimbabwe in the later half of 2008 due to interruptions to the water supplies and shortage of healthcare. Asthma and other respiratory ailments are problems millions of locals suffer at sites like abandoned metal mines and factories and polluted urban complexes. Polluted areas are growing as the world population swells and people in developing countries like China, India and Vietnam are buying more and more goods like automobiles, electronic and other consumer goods and taking to lifestyles once mostly limited to rich countries like the US and Europe.

Civil unrest and war contribute to the spread of infectious diseases through the extensive movement of troops and equipment as well as displaced persons carrying with them infectious organisms and their vectors. For example, dengue increased in SE-Asia during World War II and the immediate post-war period due to the spread of mosquitoes and different virus strains throughout the region. Natural disasters such as earthquakes and flooding often create conditions favourable to the outbreak of communicable diseases.

Human activities such as forest clearance, road and dam building, and clearing natural habitats for agriculture and mining and pollution of water bodies and coastal waters are promoting conditions under which pathogens thrive and cause infections. In addition, the disturbance, degradation and alteration of intact habitats and landscapes that tend to keep infectious agents in check are shifting the natural balance and triggering the spread of new and existing diseases. Some examples are Ebola, Rift Valley fever, Lyme disease and Western Nile virus.

Unprecedented population growth, accompanied by rapid and unplanned urbanization results in the extensive growth of urban slums without adequate water and waste management; creating an excellent environment for these infectious diseases to flourish.

Global air, sea and land transport network continue to expand in the matter of reach, speed of travel and volumes of passengers and goods carried. These activities help the spread of infections, disease pandemics and vector form pathogens. With the expansion of international air travel, an infected person can carry a disease from almost any part of the globe to any other point over periods shorter than the incubation periods of most diseases. As a result, pathogens and their vectors now move further, faster and in greater numbers than ever before. For example, jet travel is considered as the cause for the reemergence across South and South-East Asia in the 2000s, of the dreaded disease chikun gunya of African origin, first discovered in the 1950s.

Global warming is yet another factor that contributes to the spread of infectious diseases. Warm climate provides favourable habitat for microorganisms, fungi and insects that not only cause a dramatic increase in tropical infectious diseases (e.g. jaundice, dysentery, cholera and meningitis) but also alter habitats to such a degree that people are forced to migrate as "environmental refugees."

The loss of biodiversity from human activities is also a cause for the spread of diseases. Several species act as "buffer species" to several pathogens (viruses, bacteria and fungi)). According to a recent report when these species disappear or

decrease in number, pathogen transmission increases across a wide range of infectious disease systems. For example the Western Nile virus disease spread in the US is linked to a decrease in the density of bird population. The Lyme disease and several other viral infections are examples of such infectious diseases.

With great advances in immunotherapy it has become possible to control and eliminate some infectious diseases. For example, smallpox has been eliminated in the world through vaccination. Currently a major programme is on for the eradication of poliomyelitis.

With advances in scientific knowledge efforts are continually on to control the killer infections. Not long ago there has been a confident assertion that malaria could be eradicated through the use of DDT and other insecticides by destroying the mosquitoes that transmit the diseases and by using the drug Chloroquin to treat the patients infected with the lethal form of malarial parasite-Plasmodium falciperum. Over time the mosquito populations throughout the tropics have developed immunity to most of the insecticides and even to Chloroquin. As a result malaria is once again spreading. According to a World Malaria Report released by the WHO, malaria is endemic in 109 countries with 3.3 billion people at risk. The WHO estimates put 350-500 million cases of malaria worldwide of which 270-400 million are infected with the falciperum parasite. The disease is sweeping across Sub-Saharan Africa, parts of Asia, including India, and Latin America. The biggest burden is born by Africa with 90% of cases, most being children below 5 years. About 3,000 children die of malaria every day in Africa. According to the 2010 WHO report there were an estimated

9.4 million new cases of tuberculosis in 2008 with 1.8 million deaths. The number of cases is rising each year globally especially in Africa, Eastern Mediterranean and South-East Asia. In India two patients die every three minutes.

The discovery and isolation of penicillin, the first of the class of miracle drugs called antibiotics, during the 40s has been hailed as the greatest contribution of medical science for fighting several infectious diseases. These antibiotics such as Streptomycin, Aureomycin, Chloramphenicol and a class of broad spectrum antibiotics such as Tetracycline, proved very effective against a wide range of infections like tuberculosis, pneumonia, typhoid, gonorrhoea and syphilis. With the use of antibiotics these diseases dipped to remarkably low levels the world over. But over time the microorganisms, equipped with a gene that enables them over time to produce an enzyme that disables the antibiotics, are turning into new strains of organisms (superbugs) resistant to a wide range of antibiotics. Infections from such antibiotic-resistant superbugs are being reported from all over the world. Penicillin, the first wonder antibiotic is no longer effective in treating many infections. So are many antibiotics in controlling these superbugs. The only antibiotic that combats these bugs is polymixin but it is toxic to kidneys. In such a scenario many pharmaceutical companies have even slowed or halted their research to develop new antibiotics because of high risk and low reward.

The resistance developed by microorganisms to antibiotics can be illustrated with the dreaded disease of tuberculosis. A few years after its discovery in the 40's the antibiotic Streptomycin proved to be a very effective anti-TB drug. It was soon realized that the TB microorganisms could gain resistance

to the single drug and often to two. Ultimately a three-drug combination of Rifampin-Isoniazid-Pyrazinamide seemed invincible. By 1960s the number of TB cases in the western countries fell so low that it was confidently concluded that the disease would be wiped out. But by 1990s it became evident even the three drug regime was not effective in treating the newly emerging multiple drug resisting (MDR) strains, which pose a greater risk to human health. Drug resistant TB arises when people are poorly treated or take substandard medicines. Findings by WHO indicate that drug resistant TB has been identified in all regions of the world but most frequently in the countries of the former USSR and in Asia. According to a 2010 WHO report 4.4 lakh people globally got infected with MDR TB in 2008 while 1.5 lakh died of MDR TB. India and China are home to 50% of the world's MDR TB cases and 3% of all new TB cases in India can't be treated with standard drug regimens.

One of the greatest challenges of the 21st century is fighting the AIDS (Acquired Immune Deficiency Syndrome) arising from the infectious Human Immunodeficiency Virus (HIV). This virus is thought to have originated in the non-human primates in the Sub-Saharan Africa and transferred to the humans in the 20th century. The virus is transferred from person to person through unprotected sexual intercourse (homosexual or heterosexual), transfusion of infected blood, and use of infected needles and instruments without sterilization or sharing of needles and syringes by HIV infected drug addicts and from infected mothers to the babies. According to the WHO 2007 figures, 33.2 million are living with HIV/AIDS the world over. Majority of these are in Sub-Saharan Africa, South and South-

East Asia, Central Asia and Eastern Europe. India accounts for 2.5 million HIV-positive patients. The virus has so far defeated the best efforts to develop a vaccine by evading and undermining the immune system. Recent reports however indicate some success in developing a vaccine for the dreaded virus. The world now faces epidemics of microbial resistance. Who will be the winner- The disease causing microbes at the bottom of the tree of evolution with their increasing resistance to antibiotics or the human at the top of the tree of evolution with the help of medical science? Time alone will tell.

Another infection of nonhuman origin is the Bird Flu, which is spreading the world over forcing the culling of millions of ducks, chickens and wild birds. The infection has also spread to humans, causing more than 250 fatalities. Yet another viral epidemic that originated in Mexico is the swine flue, believed to be born out of a mix of human and bird flue viruses that infected pigs. It has a high transmissibility rate, spreading across the continents. The disease was even declared as a pandemic by the World Health Organization. To date the impact of the disease was however not found to be very different from that of a typical flue. It is alleged that pressure from profit-motivated pharmaceutical companies led the WHO to declare this disease as a pandemic! The WHO however denies these allegations.

Recently reports emerged of the discovery of a deadly superbug in water supplies of New Delhi. Overseas scientists claim that this superbug, called NDM-1, is being imported back into UK and other western countries through patients returning there after treatment in India. Indian scientists however say that this is a false alarm because the West is losing patients in their hospitals to Indian hospitals which provide very cheap and

efficient healthcare! This apart what is particularly worrying is that this superbug is resistant to all antibiotics including those belonging to the Carbapenem group.

While scientists are battling the microbial infections, great advances in biotechnology and bioengineering have opened up opportunities for producing microorganisms in modified forms for use as weapons of war against which humans, animals and plants have no immune defence. Though the UN Biological and Toxic Weapons Convention prohibits the production of biological weapons, some countries are reported to be engaged in developmental activities in this area. A recent report does not even rule out the possibility of ecoterrorists unleashing microorganisms which could spread disease and destroy food crops with devastating speed.

Cardiovascular disease is another killer disease. Globally 17.1 million people die of this disease every year. One study shows that the Indian heart, due to its faulty genetic make up, is more prone to cardiovascular diseases than an African or a Caucasian one. About 18 per cent of all deaths in India are of cardiac origin.

Lifestyle diseases (also called diseases of civilization) are becoming more and more widespread. Lifestyles and eating habits in the rich western countries and in the affluent societies elsewhere have changed substantially through rising consumption of meat, dairy products, alcoholic beverages, and tobacco products. Added to this there has also been a significant reduction in physical activity. These factors have been responsible for the rise in obesity, incidence of diseases such as Alzheimer, cancer, atherosclerosis (heart attacks and strokes),

renal failure, diabetes (type 2) and depression. Atherosclerosis and diabetes kill about 25 million people every year, more than the number killed by wars, famines, AIDS, TB and malaria combined. The International Diabetic Federation says that India, called "the diabetic capital of the world" with 40.9 million diabetics, is heading towards a diabetic explosion, with 87 million people to be affected by 2030. China's 43.2 million diabetics will rise to 62.6 million while the number of diabetics in the US will rise from 26.8 million to 36.0 million. A report by the Centre for Disease Control, US says that nearly 27 per cent of Americans are considered obese. Every American consumes 3,800 calories per day as against optimum 2,350 calorie healthy diet. To meet this demand the US produces 80 billion pounds of meat, with poultry alone making up 35 billion pounds. Animals are raised in miserable conditions, crammed together on factory farms filled with high calorie, corn-based feed that fattens them up and helps move them to the slaughter house as fast as possible. While it takes up to two and a half years to raise a grass-fed cow, it takes just fourteen months with this feed to make it slaughter-ready. The impact of obesity and diet-related disease on rich countries like Britain, US, Australia, Germany, the Netherlands is already causing a terrible, unsustainable strain on healthcare and other social services. With rising consumption of processed and fast foods, the incidence of obesity is on the rise in developing economies too. Obesity has already affected 5 per cent of Indian population. Beef reared in industrial conditions are dosed with antibiotics and growth boosting hormones, which leave residues in milk and meat. These residues are causing adverse effects on people. A recent study showed that American girls as young as seven years are entering puberty at double the rate they were in the

late 1990s, probably as a result of obesity epidemic and also the hormone residues in the environment entering the food they consume. The anti-obesity drugs increasingly used by people are not only unlikely to provide lasting benefit but cause several side effects such as high blood pressure, faster heart rate, drug addiction, restlessness and insomnia as well hormonal disturbance.

The incidence of depression is on the rise especially among urban population. It is a disorder sensitive to an environment that produces feelings of helplessness, sometimes even driving people to commit suicide. It is most pronounced among the elderly as well as adolescents and young adults who have been deprived of the opportunity of spending life surrounded by relatives and friends.

There are also diseases called diseases of choice, such as alcoholism and drug abuse that lead to addictive behaviour. The health effects associated with alcohol consumption include cirrhosis of liver, epilepsy, cardiac diseases and alcoholic dementia. The world is increasingly facing massive social problems arising from alcoholism.

Illicit drugs (stimulants, narcotics and hallucinogens) have become part of modern life and one of the gravest threats to the human society. Illicit drug use is becoming a serious public health problem affecting almost every community. They provide the thrills, kick and excitement and an escape from anxiety. There are nearly 200 million drug addicts worldwide, with India accounting for an estimated 75 million. The use of illicit drugs is increasing rapidly among the youth in all parts of the world causing serious health, security and social problems. Figures

suggest that more money is spent on illicit drugs than on food. Over the past few decades the illicit drug industry has grown into a highly organized multinational enterprise, employing hundreds of thousands of people, including women and children, and generating well over US$ 320 billion every year. The value of illicit drugs exceeds the value of international trade in oil and almost equals that of global arms trade. The money from drug trafficking is used for buying arms to promote terrorist activities in several countries. The main drug producing centres are Afghanistan, Bolivia, Colombia, Iran, Myanmar, Peru, Pakistan and Thailand.

A significant development in medical science is the potential life saving power of stem cells, extracted from the blood of the umbilical cord of the new born baby. These cells generate other cell types in the body, and can be used to treat life-threatening diseases such as leukemia. Kept in a frozen condition they have a shelf life of 21 years. Many affluent couples are increasingly opting for the preservation of the stem cells of their babies in stem cell banks as insurance for many life threatening diseases.

Yet another interesting advance is the development of methods to greatly increase the human lifespan beyond 100 years or even make it limitless. This is to be achieved through identifying longevity determinants and their exploitation. An international team of scientists has recently claimed that they have identified a gene that that appears to prevent cells from ageing and help individuals to live for more than hundred years. "Death, thou shalt die," said John Donne four centuries ago! According to Ray Kurzweil our technological and genetic knowhow is marching at such a furious pace that in 20 years'

time we should be able to replace our kidneys, livers, hearts and even minds with functioning vital organs made by human hands, making us live for ever. One begins to wonder whether this already overcrowded planet can endure the burden of an ever-increasing population.

"Everyone wants to go to heaven, but no one wants to die!"

This biological revolution will benefit only the super-rich " who will be able to grow their own replacement organs, take specially designed drugs made just for them and use genetic research tools to alert them of any possible health dangers for them or their children." The futurologist Paul Saffo observes that this will help the very rich, who alone can afford these benefits, becoming a completely separate species. He further observes, "Imagine if the very rich can live, on average, 20 years longer than the poor. That is 20 more years of earning and saving. Think what that means about wealth and power and the advantages you pass on to your children."

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Energy for the Billions

"If developing countries like China were to follow the US example in energy consumption, then the entire global oil supply should be sent to China- and it would still not be enough."

- Guo Shuqing
Chairman, China Construction Bank

Energy from the Sun, the only God we can see, sustains all the life processes on our planet. The light energy radiated by the Sun converts carbon dioxide, water, nitrogen, sulphur and phosphorus into chemical energy in the form of carbohydrates and other energy-rich compounds in plant materials, which become food for plant eating organisms (herbivores) and a succession of meat-eating (carnivores) organisms. Huge quantities of this plant material are also accumulated underground over millions of years turning into chemical energy in the shape of coal, oil and gas (fossil fuels).

Humans developed the capacity to convert this chemical energy into desirable forms, i.e. plant materials to meat, wood to heat and the fossil fuels to electricity and locomotion. This activity began with the primitive human, who originated in East Africa about two million years ago. To begin with he did not discover fire and its use. He could therefore eat only what was available from vegetation. After learning how to make fire about 1.5 million years ago, the primitive human was able to cook the animal meat he hunted and eat it, marking the beginning of the use of heat energy generating by burning wood. The early agricultural human who evolved about 5,000 years ago harnessed draft animals for growing crops, which helped him consume more energetic food. The advanced agricultural human of 1400 A.D. invented devices for tapping power from wind (windmills) and water (water wheels) and began using small

amounts of coal for heating and animals for transportation. With the ushering in of the steam engine during the Industrial Revolution in England in the 18th century, there was a sea change in energy use. The steam engine helped unlocking the huge deposits of coal, which became a rich energy source. The steam engine also allowed the transport of coal on a massive scale, providing power to locomotives, factories and farm implements. Coal became an energy source to produce steel for machinery. The world coal production, which was about 10 million tons in 1800, shot up hundredfold by 1900. The coal powered steam engine was used for installing the world's first electric generator in 1880. Very soon electrical lighting was commercially available. The steam engine helped human to unlock the Earth's vast fossil fuel and mineral deposits. This period also marked the harnessing of the hydro energy of the fast flowing rivers.

By 1800, oil, a new form of fuel from underground entered the energy scene. Initially it was used for lighting. By the end of the century oil was processed into gasoline (petrol) and this became the fuel for the internal combustion engine, challenging the steam engine for use in automobiles. The steam and oil engines brought about a total transformation of the means of transport over land, sea and in the air. With the development of the assembly-line methods of production, automobiles came within the reach of the common man. Ships and ocean liners of larger and larger dimensions displaced the sailing ships on all ocean routes of the world. Air transport became a reality in the 20th century with regularly scheduled flights criss-crossing the nations and continents. The decades following 1935 saw the use of diesel, a less expensive fuel. The diesel engines became the workhorses in industries, locomotion, and heavy transport.

Advances in electrical energy generation represent a landmark in energy production. Initially used for lighting, centralized electrical generating systems began operating urban electric tramways and underground railways (e.g. London underground) by 1880s. Several centralized electricity generating systems in Europe and North America began supplying electrical power to large urban centres. By the turn of the 19th century numerous electrical appliances such as stoves and irons, vacuum cleaners, washing machines and other domestic appliances that made domestic chores less exacting, appeared in the market. Gas supplied through pipes laid over long distances also met the energy requirements of industries as well as the urban centres.

The early decades of the 20th century saw the development of hydro energy for electrical power generation through construction of dams across large rivers (e.g. Hoover Dam in the US). The post World War II period saw the harnessing of nuclear energy for electrical power production. Nuclear power plants soon sprang up in the industrial economies.

The second half of the 20th century ushered in the plastic era with oil and natural gas as the feedstock. The production of a variety of plastics (e.g. polystyrene, polyethylene, PVC, polyacrylonitrile, and Teflon) and chlorofluoro compounds (refrigerants) enabled the manufacture of myriad energy-consuming appliances such as air conditioners, driers, television sets, power tools and even fancy appliances like electric shoe buffers and tooth brushes. Synthetic fibres, antibiotics, fertilizers, pesticides and other chemicals and pharmaceuticals also are the products based on oil and natural gas. Several dramatic innovations in communications technology, printing, photography, telephone, mass communication systems etc.

based on electrical energy made a tremendous social impact on the human society.

These developments based on fossil fuel sources, which were considered cheap and plentiful, brought about revolutionary changes in the lifestyles of people transforming them into a technological society. Mechanized agriculture, fertilizers and pesticides increased food production. New pharmaceutical products provided better healthcare services. Millions moved to cities creating large urban complexes. Mass produced consumer goods and appliances offered the means for more comfortable living. Rapid transport systems, mass communication media made the world appear suddenly smaller and more accessible.

No other century in human history can compare with the 20th century for its growth in energy use. The technological man typified by an American citizen consumes about 115 times the energy consumed by the primitive man whose energy came only through the food he consumed. Rough calculations show that the world in the 20th century used 10 times more energy than the energy used in the thousand years before 1900 AD.

The most notable feature, however, is the wide disparity in the energy consumption pattern between the industrialized countries and other developing countries. The US with a world population share of 5 percent consumes 25 percent of world's energy. The per capita annual energy consumption (thermal, electrical etc) for 2007 in terms of Kilograms Oil Equivalent (KgOE, the unit in which total thermal and electrical energy consumption is represented) for some representative countries in the two categories are, US - 7,920.5; UK - 3,993.8; Singapore -7,103; China - 886.5; India - 514; Pakistan - 441; Bangladesh

-144.9 and Sri Lanka – 422 with a world average value of 1,788 KgOE. This energy comes from Oil (34.4%), Natural Gas (21.2%), Coal (24.4%), Nuclear (6.5%) and Renewable (essentially hydro and wind) (13.3%). The International Energy Agency (IEA) in its forecast for 2009 projects that the total world energy use will rise 44% from 2006 to 2030. 73% of this rise will be in non-OECD countries (e.g. China, India, Brazil and South Africa) compared to 15% in the OECD countries (30 industrialized countries including Japan and Korea).

Electrical energy is the most important energy source in domestic and industrial sectors. The per capita annual electrical energy consumption (in kWh) of some countries is, US – 12,924: UK - 5,773; China – 2,179; 8,176; India – 466; Pakistan – 430; Bangladesh – 139.54 and Sri Lanka – 348 with a world per capita average of 3,240 kWh. A major part of world population still lacks access to electricity. The UN estimates that more than 2 million villages worldwide are without electric power for water supply, refrigeration, lighting and other basic needs. Many African and Asian countries, including some oil-rich countries (e.g. Nigeria) are dogged by irregular and sparse electrical energy supply through a combination of droughts, wars and ageing equipment.

Worldwide demand for oil and oil products could rise from 85 million barrels per day (mbd) in 2006 to 91 mbd in 2015 and 107 mbd in 2030. At the same time oil production rate is projected to decline by 6.7% in 2007 and 8.6% in 2030 putting pressure on oil supply, leading to price escalations as is being experienced already. Over 2/3 of the oil is used by the transport sector. Motor vehicles cars, trucks, buses and scooters account for nearly 80% of this transport related energy. In 1950 there were only 70 million cars, trucks and buses. By 1994 their

numbers rose to 630 million. If the present rate of growth continues there will be 1.5 billion vehicles on the roads by 2025. If all the world's motor vehicles were to line up bumper to bumper they would circle the globe 120 times! US has a quarter of the cars with 1000 cars for 1200 people. China has 8 vehicles per 1000 people and India 7 cars per 1000 people. Actually the number of motor vehicles has roughly tripled in India while it has increased 10-fold in China. It is projected that transport energy use will rise in the developing economies (especially China and India) accounting for 60% of the rise in oil demand. To meet this rising demand China and India are already scouting in the oil-rich countries in Africa, Middle East and Asia for oil and natural gas. Unconventional oil sources like oil sands are also being exploited for oil.

Unconventional biofuels are currently attracting attention as an alternative to fossil fuels as energy sources. The biofuels include ethanol and biodiesel. The consumption of biofuels is projected to reach 5.9 mbd in 2030. Biofuels currently make up some 1.67 per cent of the world liquid fuel (petrol, diesel etc), up 0.4 per cent since 2007. The consumption growth will be particularly notable in the US where production of biofuels is projected to increase from 0.3 mbd in 2006 to 1.9 mbd in 2030. Central and South American (e.g. Brazil) countries, OECD countries and some non-OECD countries including India would increase biofuel production. Diversion of land for biofuel production is already having serious adverse impact on world food output.

Natural gas, a comparatively less expensive fuel is increasingly in demand for industrial use and electricity generation. With a reported consumption of 104 trillion cu.ft. in 2006, the demand for gas is projected to increase to 163

trillion cu.ft. by 2030. One advantage of natural gas over oil is its higher energy/carbon ratio than oil and also less pollution effect.

Coal, the dirtiest fuel, continues to be in demand with its consumption projected to increase 127 quadrillion Btu (British Thermal Units) in 2006 to 190 quadrillion Btu in 2030. Much of the projected increase in coal use occurs in non-OECD countries, mainly in China and India. The coal based electricity generating capacity of China is projected to nearly triple from 2008 to 2030. Power generation in India will triple between 2005 and 2030, most of it based on coal and natural gas.

In the wake of dwindling fossil fuel resources and their rising costs as well as efforts to limit greenhouse gas emissions from the carbon-based fossil fuel sources, interest is once again directed to nuclear energy for electricity generation. Nuclear power generation which stood at 2.7 trillion kWh in 2006 is projected to increase to 3.8 trillion kWh in 2030. But nuclear power will continue to be dogged by controversy in the matter of nuclear power plant safety, radioactive waste disposal and concerns that nuclear power production could be abused for the covert production of destructive nuclear weapons. The damage suffered by the nuclear power reactor in Fuchisima in Japan in the wake of a devastating earthquake followed by deadly tsunami could slow down the expansion of nuclear power generation.

Exploitation of benign renewable energy sources for electricity generation is also attracting greater attention in view of global warming from the emissions from fossil fuels. Currently much of the renewable electricity supply comes from hydro energy and to some extent from solar and wind energy.

Estimates show that some 20 per cent of all electricity comes from hydro energy with China, Brazil and India being leading producers. WorldWide Fund for Nature (WWF) estimates that world's economically feasible hydro energy potential is 2,270 gigawatts (GW) out of which only 740 GW are currently utilized. As most of the hydropower sources in the OECD countries have already been exploited, any additional hydropower contribution will be mostly from non-OECD countries like Brazil, China, India and South-East Asia. The growth in hydro power is slow because of the disastrous impacts on human settlements. Millions of people are forced to leave their traditional habitats which will be subjected to submersion through river dam construction. Ironically all the electrical power generated benefits the urban settlements and industry leaving very little for the displaced population! Wind energy has also been exploited significantly over the past decade - from 11 GW in 2000 to 121 GW in 2008. The leading producers of wind power are US, Germany, Denmark, China and India. With wind energy potential of 45 GW in states of AP, Tamilnadu, Karnataka, Gujarat, Maharashtra and Rajasthan, India has till 2008 achieved an output of 9,655 MW of wind power. With an installed capacity of 12,210 MW China has overtaken India in wind energy output. Solar power, the most limitless source is not yet an economically viable energy source. But where electricity prices are very high, say in remote areas, power through photovoltaics is in use. The worldwide installed photovoltaic solar energy generation capacity in 2008 was 16.5 GW. Another method for the exploitation of solar energy is for cooking food, heating water and generating steam for power production by concentrating solar radiation using mirrors. The method, called the photo thermic method, is best suited for power generation in arid and semi desert areas that receive a

great deal of sunlight. A plant covering 1,000 acres and producing 345 megawatts of electricity is currently operating in the Mojave Desert of South California. Plans are afoot for installing photothermic power plants in the Sahara Desert for supplying 15% of Europe's electricity demand by 2050. Morocco also has plans to build five plants with a total energy production of 2,000 MW by 2020. A single patch of Sahara, just 114,090 sq.km. in area, receives enough sunlight to meet the entire world's electricity demands through photothermic technique. A similar project is on the anvil in Gujarat state in India. The Thar Desert, with an area of 228,000 sq.km. is also considered suitable for photothermic power generation. As a part of an ambitious solar energy exploitation mission, India has recently approved expanding its current 3 megawatts output of solar energy to 20 GW by 2020 and 200 GW by 2050 at an estimated cost of $20 billion. Other renewable energy sources such as tidal energy and geothermal energy only make marginal, though meaningful, addition to the world energy supplies.

As a consequence of the heavy reliance on fossil fuels as energy source during the last century, anthropogenic carbon dioxide emissions into the atmosphere have been rising very rapidly leading to global warming with adverse impact on climate and eco services. At the present rate of fossil fuel consumption these emissions are projected to rise from 29.0 billion metric tons in 2006 to 33.1 billion metric tons in 2015 and 40.4 billion metric tons in 2030. Much of the increase is projected to occur in rapidly developing economies in the non-OECD (e.g. China and India) group mainly through the use of coal as the fuel. China plans to build 500 coal-fired plants during the coming decade. In 2006, the non-OECD emissions exceeded the OECD emissions by 14 per cent. This will rise to as high as

77 per cent by 2030. The Intergovernmental Panel on Climate Change predicts that this rise in the emissions will lead to a global temperature rise of 1.1-6.4 degrees Celcius (2-11.5 F) with catastrophic effects on the biosphere. Some projections predict even a higher temperature rise. As a follow up to the Kyoto Protocol which expires in 2012, 193 nations met in December 2009 at Copenhagen and approved an accord with weak emission control pledges spelling out a target of less than 2 degrees Celcius for global warming. The rich nations pledged US $30 billion per year and US$ 200 billion a year from 2020 onwards as assistance to the poor countries 'for mitigation and adaptation' to the adverse effects of climate change. Another important component of the Accord is to take steps for reducing deforestation. This pact however is not legally binding and allows countries to avoid any carbon energy constraints on their economic growth and do what they feel. Experts say that these weak pledges will place the world on a path towards a devastating temperature rise of 3 degrees instead of the 2 degree limit. Such a rise would drastically melt the Arctic and West Antarctic ice sheets causing submergences of low lying islands and cities, put the Amazon rain forest and other rain forest systems at risk of collapse, intensify droughts across the globe resulting in fall in food output and increasing hunger. Denis Meadows, the lead scientist of the Club of Rome that produced the monumental report "Limits to Growth" in the 70s says, "It might have been possible to prevent serious climate change in the 1970s and 1980s but it is not anymore. We are on a roller coaster at the top of the hill; all we can do is to hold on tight."

The Copenhagen Accord betrays the reluctance of both developed and developing economies to move away from addiction to lifestyles based on carbon-based fuels. The reason

the world economies use carbon-based energy is due to its being the cheapest source of energy at the present time and is likely to remain so in the foreseeable future whereas the economic cost of decarbonizing the world's economy (through the use of renewable alternate energy sources such as solar, wind) is massive, running into trillions of dollars. A commentator remarked, "The global community is left resembling an alcoholic who has decided to save up for a liver transplant rather than give up drink." The ramifications of this political accord will emerge in the future confabulations slated to evolve a plan giving shape to mechanisms that spell out legally binding emission targets, deadlines and penalties for failures as well benefits to achievers. Meanwhile carbon dioxide emissions continue to rise with the International Energy Agency reporting a 5% jump in 2010 over 2008.

The fortunes of the human society are inextricably linked with energy supplies that do not harm the biosphere. Providing affordable energy security to sustain global economies and pulling developing economies out of poverty, halting climate change, and protecting the eco services constitute a major technological challenge of the 21st century.

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Fertility

"Neglect of an effective birth control policy is a never-failing source of poverty which, in turn, is the parent of revolution and crime."

- Aristotle (384-322 BC)

The fertility of a species is its natural capability of multiplying itself. Human fertility depends upon several factors such as endocrinology, sexual behaviour, nutrition, culture, instinct, time, economics, way of life and emotions. Fertility rate, also called total fertility rate, is a demographic measure. It is the number of children born to a woman. Replacement fertility is the fertility rate at which women would have only enough children to replace themselves and their partners. For high mortality countries a replacement fertility value of 2.5 children per woman and for low mortality countries a value of 2.1 are acceptable. Population stability is considered achieved at the fertility rate (replacement fertility) of 2.1. A value greater than 2.1 represents positive population growth while a value less than 2.0 indicates a negative growth. A high fertility rate of 5.0 during 1950-55 contributed to the rapid growth of world population. During 1985-90 the fertility rate fell to 3.85. The Population Reference Bureau reported a world fertility rate of 2.6 in 2006, which indicates a further slowing down of population growth.

The fertility rate in developed (industrialized) countries, which stood at 2.84 during 1950-55, fell to 2.03 during 1975-80. By 1985-90 the value fell further to 1.89 indicating the onset of a negative population growth rate. Europe's fertility rate has fallen to 1.47 and that of Japan to 1.43. Spain has the lowest value of 1.15. The fertility rate of US, the most advanced country, stands at 2.09 partly due to its liberal immigration

policies and the higher fertility rates among the immigrant groups. For developing countries the high fertility value of 6.16 during 1950-55 fell to 2.9 (3.4 excluding China). Africa, with the largest number of developing countries, is the world's fastest growing region with fertility values as high as 7.37 (Niger and Mali). As a result Africa is projected to double its population before 2050. According to a May 2011 UN Report Pakistan, Nigeria, the Philippines, Ethiopia, the Democratic Republic of the Congo, the United Republic of Tanzania, Sudan, Kenya, Uganda, Iraq, Afghanistan, Ghana, Yemen, Mozambique and Madagascar account for 75 per cent of the population of high-fertility countries. The report also says that between 2011 and 2100, populations in high fertility countries would more than triple (1.2 billion to 4.2 billion).

China and India are world's most populous countries. India has currently a fertility rate of 2.9. China, in sharp contrast, has a value of 1.6 indicating a negative growth rate. This is due to the one-child per couple rule introduced by the Chinese government in 1979 to alleviate overpopulation. This involved coercive practices such as forced abortion and sterilization. This has led to problems such as negative population growth in some areas and population ageing. The government has now liberalized its policies to some extent.

India was the first country in the world to launch a mass media campaign to spread the concept of voluntary family planning through contraceptive methods and by offering incentives. Notable success was achieved in controlling the population growth with a fertility rate of 2.9 reported for the period 2001-05. Projections indicate that the ideal value of 2.1 will be achieved by 2020. Surveys show that Delhi, Himachal Pradesh, Tamilnadu and Kerala have already achieved this target

while the states of Andhra Pradesh, Karnataka, Maharashtra, Punjab and Orissa will follow suit in the near future. But the fertility rates in the Hindi-speaking states of Bihar (4.3), Chattisgarh (3.5), Jharkhand (3.7), M.P. (4.0), UP and Uttaranchal (4.7), Rajasthan (3.09), as well as Gujarat (3.2) continue to be high.

The divergence in the fertility rates has created difficulties in the periodical determination of the Lok Sabha constituencies as required by the Constitution of India. The strength of the elected representatives of the Lok Sabha is fixed at 554. The number of seats to be allocated to the states is based on the principle of uniform population-seat ratio. In this exercise of redrawal of the Lok Sabha constituencies, the Southern states, which have effectively implemented the population control programmes, could lose as many as 15 Lok Sabha seats (AP-3; Tamilnadu-7, Karnatak-1 and Kerala-7) while the Hindi-speaking states of UP (including Uttaranchal), Bihar (including Jharkhand), MP (including (Chattisgarh) and Rajasthan would gain 5, 3, 3 and 4 seats respectively. With the southern states protesting against this loss of seats, concerns were expressed about a North-South divide. The problem was solved by the Lok Sabha through an amendment putting on hold this exercise till 2026 by which time the demographers expect the entire country to achieve the target of 2.1 fertility rate. On the basis of present formula, a member of the Lok Sabha is expected to represent a population of about 19 lakhs. But actually a member from Rajasthan represents 23 lakhs while a member from Tamilnadu or Kerala represents 19 lakhs. The provisional Census figures for 2011 indicate that this diversity persists with two contrasting demographic "nations" emerging in the country. All four southern states –Andhra Pradesh, Karnataka, Kerala, and Tamilnadu - initiating the process of population

stabilization having already achieved the replacement level fertility of 2.1 children per woman while the four large north Indian States of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, have still a long way to go before they achieve the required level. Projections indicate the population of the four South Indian States which stands at 21 per cent will decline to 16 per cent of the country's population in 2051. In contrast, the population of the four north Indian States will increase from 37 per cent in 2011 to 44 per cent in 2051.

Another issue with political overtones relates to the demographic trends in the Muslim population in India. One school of thought averred that the fertility rates among the Muslims are high, as they do not practice family planning. As a result, the minority Muslim population was rising at a faster rate and could in course of a few decades equal the Hindu population. But studies have clearly established that the Muslim fertility rate also is showing a negative trend. The Muslim fertility rate, which was 4.4 in 1992-93 declined to 3.6 in 1998-99 while the Hindu rates for the corresponding periods were 3.3 and 2.8.

The fall in fertility rates below 2.1 is currently a matter of concern to the industrialized world. This is attributed to a rise in infertility among its population. With infertility set to double in the next decade the sustainability of population in Western Europe is at risk. Many infertile couples are turning to developing countries to adopt babies. In 2001 some 34,000 children from Asia and Eastern Europe found new homes in Western Europe and North America. The booming international adoption trade has even spawned a solid black market in which children are abducted and sold.

Advances in medical sciences have also helped infertile parents to bear children through methods such as in vitro fertilization (IVF), embryo donation and surrogacy. As a result, clinics are turning out to be places for conception instead of bedrooms. In IVF the woman's egg cells are fertilized outside her womb by the sperm of her partner. The fertilized egg is then transferred to the woman's womb to establish a successful pregnancy. Women getting their egg cells fertilized by the sperm of unknown donors are also on the rise.

In IVF, multiple embryos are formed out of which only one is utilized. The rest of the embryos generated can be preserved under deep freeze for a long time. If both the parents are infertile, these couples or even single women can adopt these spare embryos. India has now become a flourishing centre for these procedures with a large number of couples from western countries choosing to adopt embryos and not babies. Embryo adoption offers couples privacy and secrecy so that they may not worry about societal acceptance of an adopted child.

Surrogacy, another means of having babies, is becoming more and more popular. Surrogacy involves creation of a baby through another woman when the woman who intends to be a parent is infertile in such a way that she cannot carry a pregnancy to a successful term. In India surrogacy services are far cheaper than in the West with a growing number of poor Indian women volunteering as surrogate mothers for a price.

Working women are veering round the idea of preserving their eggs in order to have children late. This involves freezing the eggs at liquid nitrogen temperatures till the owner decides to have a child. The eggs are then thawed and fertilized in vitro.

Single women who want to be mothers are also reported to be getting their eggs fertilized by donor sperms to bear children.

Mistakes in the fertility clinics could also bring anguish to the couples turning to in vitro fertilization. In 1993 a Dutch couple went to a prestigious fertility clinic in the Netherlands for in vitro fertilization. They gave their sperm and eggs to the technician and the in vitro fertilization took place in March 1993. The following December the lady gave birth to twins. Surprisingly one baby was blond like the father and the mother while the other was black. This naturally caused bewilderment and pain to the couple living in small and overwhelmingly white surroundings with social implications. Investigations revealed that the technician committed a mistake by contaminating the sperm of the Dutch father with the sperm of a man from the Caribbean Island of Aruba!

With all these reproductive services available at a low cost compared to the West, India is emerging as the main destination for the childless couples from the West. It is even said that India is fast becoming a centre of "reproductive tourism". After IT services "it is the turn of babies to be outsourced from India!"

The fact that Mendelian rules of inheritance are also applicable to human species in respect of sex-linked traits and diseases gave birth to the idea that such disorders could be wiped out through forbidding people with such afflictions from having offspring. Also, by directing proper mating, the human breed might even be improved as in the case of improved breeds of cattle. These ideas form the basis for the concept of eugenics. The British scientist, Francis Galton (1822-1911), a cousin to Charles Darwin, was the first to suggest that the human society could be improved through better breeding. After several

decades of study of the ancestral trees of eminent writers, scientists, philosophers, artists, and statesmen, Galton became convinced that great abilities were passed from generation to generation and that it would be desirable to produce a highly gifted race of humans by judicious marriage during consecutive generations. He coined the term eugenics from the Greek word, which means "good birth". These ideas inspired the eugenics movement in the US through the efforts of Charles Davenport (1866-1944). As a result, twenty-four states authorized the sterilization of a wide variety of undesirables that included criminals, epileptics, insane and the mentally retarded. The renowned jurist, Oliver Wendell Holmes (1841-1935) once observed, "It is better for all the world if, instead of waiting to execute degenerate offspring for crime or to let them starve for their imbecility, society can prevent those who are manifestly unfit for continuing their kinds." Several wealthy people such as Carnegie, Rockefeller, Harriman, and Kellogg supported the eugenics movement because it provided a means of social control "in a period of unprecedented upheaval and violence." By 1941, about 36,000 people were sterilized in the US. In 1930s, the four Nordic countries, Denmark, Finland, Norway and Sweden enacted the eugenics laws intended to prevent the "degeneration of the race". No fewer than 60,000 young women deemed mentally defective or otherwise handicapped were sterilized till 1976 when the laws lapsed. Nazi Germany under Hitler's rule practiced eugenics as a mass movement. In the name of breeding the Aryan "master race", millions of Jews, Gypsies, Catholics and others were thrown into concentration camps or exterminated. When these atrocities came to light after World War II, popular support for eugenics waned in the USA and elsewhere.

Experimental evidence for the genetic origin and inheritability of many complex disorders and traits is once again causing a revival of interest in the concept of eugenics. William Shockley (1910-89), co-inventor of the transistor, proposed that Nobel Laureates should contribute to a sperm bank. Any females could be inseminated from this sperm bank to bring forth an offspring with high intellectual attainments. Similar sperm banks could be created with the sperm contributed by athletes, artists and other high achievers to bring forth progeny that could improve the human race. Social scientists however feel that only the wealthy sections of the society will be able to afford their germ line this way, while others who cannot afford will be left behind. Fears are expressed that this eventually will result in the creation of a new genetic aristocracy or genetocracy in a biological caste system. Apprehensions are expressed that programmes such as reproductive decisions based on foetus screening, in vitro fertilization, cloning, and gene therapy for improving workplace or school environments are driving the world to the threshold of a neoeugenics culture.

Studies however show that a person's traits are partly inherited (nature) and partly determined by the environment in which the person is brought up (nurture). There is no guarantee that copies would be everything like the originals. A person born with the potential for excellence cannot blossom if he does not find the right environment. A genetically potential scientific genius beaten and ill-treated as a child might become a mad genius. An artist who is introduced to alcohol in his young age might merely become an alcoholic. Extensive studies on families and twins show that heredity accounts for between 30 and 70 percent of the variation in personality traits among people, while the environment accounts for another 30 to 70 percent.

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Food for the Billions

"When a man's stomach is full, it makes no difference whether he is rich or poor."

-Euripides (480-406 BC)

"Slaughterhouses are kept far away from human eyes because that makes meat much easier to digest."

- George Bernard Shaw (1856-1950)

"We are sleepwalking towards an avoidable age of crisis, one in seven people go hungry everyday despite the fact that the world is capable of feeding every one."

- Barbara Stocking, OXFAM

For the first time in recent decades, the availability of food for the teeming billions seems to be in doubt. While the global food production continues to increase, the growth in demand has overtaken the growth in supply.

Efforts have been continuously on since early times to increase food production through improvements in agricultural technology to meet the food needs of the rising population. In ancient times, the farmers knew that the first yields on a plot of land were much better than those of the subsequent years. This caused them to move to new uncultivated areas which again showed the same pattern of reduced yield over time. This system, known as shifting cultivation, is still pursued by the aboriginal population in some regions of the globe. Eventually it was discovered that plant growth on the same plot could be improved by spreading animal or bird manure throughout the soil. With advances in fertilizer technology based on scientific chemical theory, nitrogen and phosphorus were established as

the essential major nutrients for plant growth. By mid 19th century, naturally occurring inorganic fertilizers such as Chile Saltpetre (sodium nitrate) and rock phosphate came into use for increasing food output. At the beginning of the 20th century, Germany, faced with the shortage of Chile Saltpetre, looked for alternate sources of nitrogen through developing methods for fixing the nitrogen in the atmosphere in a form suitable for manufacture of fertilizers and also explosives. This was achieved successfully by Fritz Haber and his associates through the synthesis of ammonia, a convenient starting point for the purpose. This gave Germany the capacity to improve food production as well as build arsenals of nitrate-based (e.g. nitroglycerine) explosives and prepare for World War I. This war was followed by the most destructive World War II in which an unprecedented quantity of nitrogen explosives was used. The world currently faces the bloodiest phase in its history with nitrogen explosives of various types making life insecure every moment.

Current agriculture technology is based essentially on the Green Revolution achieved in the 50s by cultivating high yield hybrid crops, using nitrogen (and phosphorus) fertilizers and intensive irrigation with huge quantities of water from groundwater sources and rivers. This has enabled one person to be fed from no more than 0.2 hectare as compared to two hectares needed in the 18th century. The global use of nitrogen fertilizers (excluding the then USSR) in 1960s was 9.0 x 106 tonnes. In 1995 this rose to 80 x 106 tonnes. By 2008-09 nitrogen fertilizer consumption was expected to go up to 101 x 106 tonnes and phosphate fertilizer consumption to 3.7x 106 tonnes. Only about 4 per cent of the nitrogen in the fertilizers ends up in the

form of plant-based diet and 4 per cent in the form of meat diet. The rest of the nitrogen finds its way, in various chemical forms, into the water courses, the soil and the atmosphere polluting the environment.

About 70-80 per cent of total water used globally goes to the agricultural sector. This is increasing further with rising agricultural production. Water discharged from irrigation systems cannot be recycled because it carries large quantities of nutrients, minerals and pesticides. This water is released into river, marine and ground water systems, causing extensive damage to the ecosystems through eutrophication. Excess of nitrogen also reduces soil fertility through salinization and promotes weed growths, and risk of pests. Water polluted with nitrogen also affects human health. By the end of the last century, nitrogen pollution has reached high levels in the US, parts of Europe, India and China. By 2050, the nitrogen cancer is projected to spread over large areas and engulf nearly the entire the planet, including the oceans. While chemical fertilizers help increasing the crop yields, the irreversible damage caused over a period of time also leads to lower food production. Reports indicate that crop yields in the most intensively cultivated areas using chemical fertilizers, both in developed and developing countries, have not only reached their physical limits but are even declining in some areas. It is reported that the 2.1 per cent a year growth of yields from world's grain fields between 1950 and 1990 during the height of the green revolution has already declined to 1.2 per cent. At the same time there has been an accelerating demand for food from by the rising population in countries like China, India and Vietnam, which are becoming more and more prosperous. Global demand for meat also has

multiplied in recent years, especially in China and India, leading to increased demand for cereals (e.g. soya) as animal feed. It takes 2 to 6 kilograms of grain fed to a cow, pig or chicken to make one kilogram of meat, milk or eggs. About a third of harvested grain in the world is now used as animal feed. In US it is as high as 50 per cent. David Pimentel of Cornell University says, "If all the grain fed to livestock in the United States were consumed directly by people, the number of people that could be fed would be nearly 800 million." Compounding the problem is the rising input costs, such as fuel (diesel, petrol and natural gas), petroleum-based fertilizers, and transport. The sources of phosphate fertilizers are also running out leading to their steep price rise. Some countries, notably China and India, have even restricted grain exports to make their own people get fed. This move has particularly hurt net food importers such as Bangladesh, Indonesia and most African countries.

The policy of several countries to mandate the use of biofuels such as alcohol has led to the diversion of large tracts of agricultural land from food production with attractive subsidies for growing corn, a source of alcohol for use in the blended fuel called gasohol. The rising demand for biofuels is leading to deforestation of vast areas of land for corn production. Worldwide fuel ethanol production rose from 7.8 billion gallons in 2000 to an estimated 20.9 billion gallons in 2008 with Brazil and US as the topmost producers. India produced 52 million gallons in 2007. We now see on the roads drunken automobiles (running on gasohol fuel) in addition to drunken drivers! The diversion of agricultural land for biofuel production to meet the growth in demand has driven up the food prices steeply, sparking riots, political instability and growing worries about

feeding the poor people. This makes achieving the Millennium Development Goal to halve the number of hungry by 2015 doubtful. A recent UN World Food Program report says that the rising food prices have pushed another 102 million people into hunger in the first half of 2009, raising the total number of hungry people to 1 billion. Ironically about 40 per cent of all the food produced in the US is thrown out! At the same time the number of US homes lacking food (due to poverty and disrupted eating habits) rose from 4.7 million in 2007 to 6.7 million in 2008. In India thousands of tones of cereals are rotting in the godowns while tens of thousands of people are short of food!

The FAO says that the world faces the challenge of not only ensuring food for the one billion people (most of them in Asia and Africa) who are currently hungry but also for the projected ten billion in 2050. For this we need to double global food production by 2050 and bring into cultivation additional agricultural land of about 1500 sq. km each year. Though tropical forests in Amazon, Indonesia, and the Congo are being chopped down for conversion to farmland, the area of farmland around the world now in use has been shrinking due to salinization and desertification and water shortage, partly offsetting rise in the gain output. Water availability for agriculture is another problem the world is going to face. Over the past 50 years, as the world's population rose from 3 billion to 6.5 billion, water use has roughly trebled. With the population rising to ten billion by 2050, the demand for water for raising food will soar. The FAO estimates that the world will need as much as 60 per cent more water for agriculture to feed these billions of extra mouths. Asia itself is projected to be inhabited by 5 billion people by

2050. The food demands of South Asia by 2050 would require the irrigation of 30 per cent more land and 57 per cent more water for irrigation while in East Asia, farmers would require 47 per cent more land and 70 per cent more water. With unpredictable variations in water availability through climate change, water management problems will become more and more complex. Figures from the UN show that global food prices in 2010 are at a record high and that they will continue to remain high and rise, posing a major threat to food security to the poor countries which often depend on food imports. OXFAM projected in May 2011 that the prices of staple foods will cross more than double by 2030. The factors that contribute to this rise are, climate change, depleting natural resources, global scramble for land and water; the rush to turn food into biofuels, a growing global population, and changing diets. Half of the increase will be caused by climate change.

To meet the rising demand for food and biofuel, rich nations and companies are buying up farmland in some of the world's poorest countries (especially in Africa where people are already starving) to grow food and biofuel for themselves and their customers. A number of companies from various nations are already growing sugarcane in Tanzania for supplying ethanol fuel to European Union countries. China, Sweden and many Gulf States have also initiated farm projects in Africa and South-East Asia. China with 20 per cent of the world's people has only 9 per cent of farmland. This land is dwindling due to human activities and desertification. The Chinese government and companies purchased 2.8 million hectares of farmland in Congo for oil palm plantation and invested $400 million in Mozambique to expand rice production. Worried by

the difficulties of increasing food supplies in South Korea, Daewoo, the South Korean corporate giant, signed a deal to lease no less than half Madagascar's arable land to grow grain. Widespread anger at this deal led to the overthrow of Madagascar's president. South Korea has also bought 690,000 hectares of land in Sudan for food production. UAE has bought 378,000 hectares in Sudan while Qatar bought 40,000 hectares in Kenya. India has spent $2 billion in leasing land in Ethiopia for sugar, tea and several other crops and is planning to invest double this amount for expanding these activities. The Sudanese Ambassador to India recently extended an open invitation to farmers in Punjab to take up cultivation of the vast land available in Sudan. The Government of India is encouraging Indians to buy farmland in Africa and Latin American countries and grow crops there. The produce is to be shipped back home to meet the food demand. It is estimated that Brazil has around 30 million hectares on offer, Argentina 32 million, and Uruguay 10 million. Recently two Bangladeshi companies have taken on lease unused cultivable land in Uganda, Tanzania and Gambia. Under the agreement Bangladesh will acquire at least 60 per cent of the food produced in these lands. Food outsourcing is now a worldwide realty. Several countries are even importing food from abroad, for conserving their limited water resources for other essential purposes. World seafood production also has reached its limit. Most of the stocks of ten popular fished species are being fully fished and even overexploited. With the increasing emphasis on aquaculture to cater to the needs of the affluent sections of the society, the wild catches are dwindling, depriving the world's poor of their protein sources. Freshwater fish populations also are on rapid decline. According to WWF, fish stocks in lakes and rivers have

fallen nearly 30 percent since 1970. This represents a bigger population fall than that suffered by animals in jungles, temperate forests and other large ecosystems.

Global warming poses a serious threat to food production. Scientists warn that by the end of the century, approximately half of the entire world population may face severe food shortages especially through declining crop yields such as maize and rice due to the rising temperatures. The problem will be compounded by the rising sea levels resulting in the submersion of large areas of the fertile coastal land. James Lovelock, the well-known chemist, inventor and environmentalist, feels that with a projected temperature rise of more than 4 degrees Celcius, the food output will fall to levels where the number of people remaining at the end of the century will probably be a billion or less! He does not think that the world "can react fast enough or clever enough to handle what is coming up". The hardest hit areas will be the poor and densely populated regions along the equatorial belt, home to approximately 3 billion people. Demand for food is already increasing due to rising population in the region; and this number is projected to come close to doubling by the end of the century. The food situation will be critical in view of the fact that the food grown there is not resilient to climate change. India and some other countries are already having a foretaste of such food shortages.

Scientists say that the only solution to meet the rising demand for food is a second Green Revolution through the development of new higher yield varieties of pest-resisting paddy, wheat and corn which can withstand the changing temperature conditions. Unfortunately there are yet no indications of a technological breakthrough in this direction. It

should however be noted that attaining higher yields with new crop varieties too is dependent on the soil's ability to supply the nutrients. This is possible only by intensive irrigation practices through the use of increasing quantities of nitrogen and phosphate fertilizers and water resources which could cause further damage to the ecosystems. With rising over-farming, over-fishing and adverse impact from climate change, many of today's food ingredients could even disappear from the planet. The world thus faces the hard task of meeting the mismatch between a growing population and a lagging growth in food supplies, by developing the technology to meet the food demand of future generations as well without harming the earth. If this goal is not achieved, global food security will pose a great challenge with economic, social, political and technological implications.

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Gender Imbalance

"When a son is born,
Let him sleep on the bed.
Clothe him with fine clothes,
And give him jade to play….
When a daughter is born,
Let her sleep on the ground,
Wrap her in common wrappings,
And give broken tiles to play."

- Chinese "Book of Songs" (1000-700 BC)

Sex ratio is the ratio of males to females to males in a population. In humans the sex ratio at birth is commonly assumed to be 950 girls to 100 boys. It is known for centuries that boys are more likely to die in infancy than girls. Nature has thus ensured that that there will be equal number of young women at puberty. This ratio has been so stable over time that it is assumed as the natural fact. Deviations from this ratio (called gender imbalance) is a demographic effect in certain situations such as warfare (excess of females), large scale immigrations of male labourers unable to bring their females with them (e.g. Gulf countries). But in some countries sex selective abortions and infanticide are bringing down this ratio in favour of males with critical implications. For example in India the sex ratio is around 890 and in China about 875. Vietnam is another country that belongs to this group.

International efforts to mobilize the world to implement family programmes to control world population growth have been leading to imbalances in sex ratios in certain regions.

Notably this imbalance is assuming dangerous proportions in the Asian countries laying bare the old bias for boys, with the girls being seen as economic and social burden. A son is seen as a deposit in the bank while daughter that leaves her family home at marriage and goes to live with her in-laws, is considered an investment without any financial return. With access to modern technology methods such as ultrasound, amniocentesis (analysis of uterine fluid) are extensively used for sex-selective abortions, the problem is becoming acute in China, the Indian sub-continent and some Asian countries. China is reported to have a girl/boy ratio of 944/1000, India 914/1000, Pakistan 938/1000, and Bangladesh 953/1000. The UN Population Fund states, "If a woman has given birth to several girls, she is more likely to abort subsequent pregnancies until she conceives a boy." Prenatal sex determination is banned in all countries but the regulation is invariably flouted in countries that show bias for boys. Female infanticide is also resorted to by poor families. According to a recent study there are 2.1 billion men against 1.9 billion women across Asia (i.e. 1100 men to 1000 women). By 2050 the number of men outweighing that of women in India is projected to be 33 million while the number in China is projected to be 25 million even if the current rate of gender imbalance declined. There is a similar trend in South Korea, Taiwan, Nepal and Vietnam also. In contrast the girl/boy ratios in the industrialized countries of Japan, US, and Russia are 1041/1000, 1029/1000, and 1140/1000 respectively.

A study conducted by the UCL Centre for International Health and Development, London and published in March 2011 confirms that easy access to sex-selective abortions is the cause

to significant imbalances in the male/female population in China, India and South Korea and that India will have 20% more men than women in two decades.

In the early eighties China began enforcing its ambitious one-child norm to control its population growth. As a result Chinese parents often ensured that their only permitted child is a boy. Years of population engineering including sex selective abortions and virtual extermination of surplus baby girls both in poor and rich families created a nightmarish imbalance in China's male and female population. With a national average of 119 boys for 100 girls, there were 163.5 boys for every 100 girls aged up to four in the eastern city of Liyanyungang. A study by the Chinese Academy of Social Sciences concluded, "The imbalance is so distributed that there are 11 million men in China who will not be able to find brides." This number is projected to rise to 24 million by 2020. As a result, kidnappings and slave trading of women have been on the rise in areas with excess number of women. Slave trader gangs are active abducting women from North Vietnam to feed the demand in China. Illegal marriages and forced prostitution are also contributing to problems in these areas.

The dramatic fall in fertility combined with the surplus of boys and the looming rise in ageing population (see later article) has forced the Chinese Government to modify its controversial one-child policy. In addition to taking steps to strictly enforce the ban on prenatal sex determination and sex-selective abortions, programmes have been launched in some provinces to provide benefits such as pension to couples limiting

themselves to two girls and free educational facilities to girls.

According to 2011 census reports there are 914 girls aged six and under for every 1000 boys in India. This is attributed to systematic gender discrimination. The birth of a girl child signals the beginning of financial hardships for many families in the Indian society. With the easy availability, even in the villages, of ultrasound scanners and sex-selective abortion facilities at affordable cost, people are taking recourse to sex selective abortions. The UNICEF says the catch line is "Spend 600 rupees now and save 50,000 rupees later!" A recent report in the reputed medical journal Lancet says that the rich and educated Indian parents are increasingly aborting a second girl child. The sex ratio for second born children in families, where the first-born is a girl, has dropped overall from 906 girls per 1,000 boys in 1990 to 836 in 2005. The poor families also resort to female infanticide. An estimated 4.2 – 12.1 million female foetuses have been aborted in India in the last 30 years. As a result an estimated 600,000 girls go missing every year.

Another recent development is the technique of gender selection by Preimplantation Genetic Diagnosis. The early stage embryos that have been produced through in-vitro fertilization of the egg cells fertilized by sperm cells outside the body are screened and the embryos of the desired gender are then planted into the womb. A growing number of Indian women of affluent societies wanting to have baby boys are taking recourse to this method offered by countries like Thailand where there is no ban against this method.

More than 11 million Indian babies, many of them

unwanted girls, live on the streets or lie abandoned in dirty children homes. Around five babies are dumped every week in a well-known Delhi orphanage. As many as fifty per cent of these babies go to families in Britain, US, Spain and Denmark. The Government of India is also encouraging British couples to adopt Indian baby girls and save them from the misery and abuse (Daily Mail, London- April 9, 2007).

The gender imbalance is most acute in the northern states with Chandigarh, Punjab, Haryana, New Delhi, UP and Gujarat reporting 773, 798, 861, 821, 898 and 898 respectively of adult girl population against 1000 adult boys. Significantly, Punjab, Haryana and Gujarat are the richest states in the country. A recent study says that Maharashtra also is following this trend with urban areas reporting 908 and rural areas 916 girls for 1000 boys. The consequential female spousal shortages are forcing bachelors from these areas to look for brides in other states. For instance a number of Haryana bachelors have gone deep south as far as Kerala, which has 1,058 girls per 1,000 males to pick up brides! A Ministry of Statistics and Programme Implementation Report (2010) of the Government of India says that the population of young girls in India in the age group 0-14 is falling when compared to that of boys, and this could "spur great social unrest". The percentage of population in this age group which was 33 per cent in 2005 fell to 31.9 per cent in 2008. At the same time the male population in the age group increased from 31.8 per cent to 32.5 per cent during this period. The report also says that for every 100 girls, 105 boys were born in 1991. This number increased to 107 in 2001 and 112 in 2009. With 600,000 girls going missing every year, there will

be a shortage of 10 million future brides in 18 years' time. Demographers warn that a society with such a large sex imbalance would affect the stability of the entire marriage system and lead to social unrest with increasing robberies, violence against women and bride trafficking. A Union Minister of the Government of India went a step further and lamented." The day is not far off when there will be no girls to marry and we'll all become gays!"

The Government of India and the state governments have initiated steps to encourage the girl children through providing free education and other facilities. Much more needs to be done for saving the girl child.

★ ★ ★

Languages

"Language is the dress of thought."

-Samuel Johnson (1709-1784)

"Language is the means of getting an idea from my brain into yours without surgery."

- Mark Amidon

Language is the means of communication, a conspicuous trait that makes the human species distinct from other species. It also covers the type of thought process which creates and uses language. A spoken language is a natural language in which words are uttered through mouth. Almost all human languages are spoken languages, with exceptions like gestural languages and body language. There are many languages that can be spoken but have no standard written form. A written language is the representation of a language by means of a writing system and is complementary to a specific spoken or gestural language. The writing system of any language is developed by its users to record speeches when the need arises. There are 25 known systems of writing. Many languages such as the Indo-European languages use the alphabet. The Mandarin (Chinese), Japanese and Korean languages use ideograms, which are symbols or characters that represent ideas or words. The 5,000 year old Sumerian language is considered the oldest written language. Vedic Sanskrit, the earliest form of Sanskrit, is about 3,500 to 4,000 years old.

Language diversity, like genetic diversity, is essential to human heritage. Each and every language embodies the cultural wisdom of a people. As in the case of living species, languages have been evolving, becoming endangered and even suffering

extinction. Any language that is in a continuous state of change is known as a living or modern language. Any language that ceases to change or develop is called a dead language. A languages typically becomes endangered and dies when speakers of a small group speaking that language come in contact with a more dominant population speaking a different language. This has been happening since the primitive hunter-gatherers transitioned to agriculture during the period of European colonial expansion, and more recently with globalization and urbanization. Language endangerment is also caused by external processes such as military, economic, religious, cultural or educational subjugation. It may also be caused by internal forces, such as community's negative attitude towards its own language. Internal pressures often arise from external sources, through halting the intergenerational transmission of language and the associated cultural traditions. All these factors contributed to the spread of English, Spanish, Portuguese and Russian.

Ethnologue is currently the most comprehensive language inventory. Its 15th edition released in 2005 lists about 6,912 written and spoken languages. Most of these languages have also sub-groups called dialects. Languages are classified into families. They are Indo-European (Europe, SW to South Asia and Oceania), Sino-Tibetan (East Asia), Niger-Congo (Sub-Saharan Africa), Afro-Asiatic (North Africa to Horn of Africa, SW Asia), Austronesian (Oceania, Madagascar, and Maritime SE Asia), Dravidian (South and SE Asia), Altaic (Central Asia, Northern Asia, Anatolia and Siberia), Austro-Asiatic (mainland SE Asia), Tai-Kadai (SE Asia) and Japonic (Japan). The thirty most spoken languages of the world are, Mandarin, English,

Hindi, Spanish, Arabic, Russian, Portuguese, Bengali, Malay, French, Japanese, German, Farsi (Persian), Urdu, Punjabi, Vietnamese, Tamil, Chinese Wu, Javanese, Turkish, Telugu, Korean, Marathi, Italian, Thai, Cantonese, Gujarati, Polish, Kannada and Burmese. About 52 per cent of the world's population speaks one of just 20 languages. Less than 0.3 per cent speaks one of the 3,340 rarest languages.

In terms of the criteria such as the number of primary speakers, the number of secondary speakers, the number and populations of the countries where used, the number of major fields using the language internationally, the economic power of the countries using the language, and the socio-literary prestige, the ten most influential languages of the world are English, French, Spanish, Russian, Arabic, German, Japanese, Portuguese and Hindi/Urdu. About 96 per cent of the world's population speaks just 4 per cent of the total world languages. English, the language that occupies the preeminent position, is the language used by 400 million people as the first language. In addition, it is a second language for about 1,400 million people, bringing the overall figure using the language to 1.8 billion. English now holds the position of the language of globalization, of international business, politics and diplomacy. It is also the language of computers and internet. It is predicted that by the end of the century, half of the world will be proficient in the English language. Britain is no longer a super power but its language now rules the world earning the sobriquet "the world language". "Rule English" has taken the place of "Rule Britannia"! According to the 2005 estimates there are at least 350 million English speaking Indians, equal to the combined English-speaking population of Britain, the US, Australia and

New Zealand. After independence South India feared that Hindi would be the killer language of south Indian languages, but English has become the killer language for all Indian languages!

Over a period of time, a language becomes endangered when its speakers cease to use it, decrease in numbers, use it in increasingly reduced number of communication domains, or fail to pass it on from one generation to the next. Gautama Buddha preached in Pali, the language dating back to the 6th century BC. It is now limited to liturgical use in Sri Lanka, Thailand and Myanmar. The language has no script. Sanskrit, a language dating back to the 1500-2000BC and called the mother of all languages, is a scientific and systematic language and its literature is easily the richest in the world. Though enshrined in the Constitution of India as one of the official languages, Sanskrit language finds limited use in the communication domain. The Irish language, often called Gaelic, Ireland's official language, has only 30,000 fluent speakers left, down from 250,000 when the country became independent in 1922.

Languages become extinct when the last of the primary speakers in a small indigenous group dies. There are 199 languages in the world spoken by fewer than a dozen people. The last person who knew the language of the Eyak people died in 2008 in her native Alaska. The last native speaker of Manx, similar to Irish and Scots Gaelic, died in 1974. An 85-year old woman, the last native speaker of Bo, one of the ten languages of the great Andamanese tribe died in February 2010, breaking a 65,000 year-old link to one of the oldest cultures. Only one speaker of Livonian remains in Latvia. Nearly 80 languages and their variants became extinct with the death of

the last known speakers. The US alone lost 53 languages since the 1950s.

Language extinction may also occur when a language evolves into a new language or form of languages. An example is Old English, the parent of Modern English. Ethnologue lists 516 languages as nearly extinct (Africa-46; The Americas-170; Asia-12; and the Pacific-210). Projections indicate that by the end of this century more than half of the spoken languages, many of them not yet recorded, may disappear.

India has a total number of 428 languages (including a whopping 6,661 mother tongues or dialects!) with 22 of these declared as official languages. Languages numbering 415 (including dialects) are living languages. UNESCO's Atlas of the World Languages in Danger of Disappearing reports that India tops the list of countries where languages are precariously balanced between neglect and extinction. There are 196 endangered languages, including 84 that are 'unsafe', 62 that are definitely endangered, 35 officially endangered and nine extinct. Some extinct languages are, Ahom and Turung (Assam), Aka-Bea, Aka-Bo, Aka-Cari, Aka-Kede, Aka-Kora, Aka-Bale (Tibeto Burman)), Oko-Juwoi (Andaman) and Pali. The death of the Andaman languages and culture will be a great loss of the links to ancient civilizations in view of the fact that the "Great Andamanese people were direct descendents of the pre-Neolithic (pre New Stone Age of more than 12,000 years ago) people. Some languages listed as nearly extinct with a handful of speakers still surviving are, Jeru (Andamans- 7 speakers), Jarawa (Andamans- 250 speaker) Onge (Andamans- 100 speakers) A-Pucikwar (Andaman- 24 speakers), Khamyang

(Assam- 50 speakers), Parang (Orissa-767 speakers), Jad (Uttarakshi, Uttarakhand - 300 speakers), Koda

(Bankura and Burdwan Dts. W. Bengal - 300 speakers), Aka Kora (Arunachal Pradesh - 1200 speakers), Ruga (Meghalaya - Less than 100 speakers), and Vishavan and Aranadan (Kerala - 150-200 speakers).

The Tibeto Burman language family consists of 400 languages. Of these about 100 are spoken in NE India, especially NE Border Region. Most of these smaller languages are endangered. These include Russo, Mimi, Sherdukpen, Bugun, Bangru and Puroik Sulung (Arunachal Pradesh) Deori and Tiwa (Assam), Chiru and Monsang (Meghalaya) and a few within the Khasi region.

So far only a small fraction of the endangered languages have been documented with respect to grammar, language evolution, anthropology and linguistics. Linguists have recently begun large scale efforts to save some dying languages. For example the Cornish, the universal language of Cornwall (UK) in 1300, went into extinction by 1990. It is being revived since then with about 300 people now speaking the language with some knowledge. The Enduring Voices Project, a joint undertaking of the Living Tongues Institute and the National Geographic, is working in collaboration with local communities around the world to document and help prevent languages from becoming extinct with the help of modern technology through creating audio visual recordings of words, sentences, stories, songs and traditions and multimedia tools. In this project India has been identified as a"language hotspot" containing concentrations of diverse and poorly known endangered

languages. This project also covers thousands of tribal communities, from East Africa to Australia and the NW Pacific Coast. The state of Andhra Pradesh has taken up the task of preparing text-books and dictionaries in tribal languages such as Gondi, Kolami, Koya, Savara, some of them having no script, as a part of literacy campaign.

If the language is extinct, much of the old tradition, culture, stories and fables, knowledge of the local environment, and even a unique world view vanishes with it. Rough projections warn that without sustained conservation efforts, half or more of these endangered languages will go out of use by the end of the century.

If I forget my native speech,
And the songs that my people sing
What use are my eyes and years?
What use is my mouth?

- Alitet Nemtushkin, Poet

About his endangered mother tongue Evenski,
spoken in Mongolia and parts of China and Russia
"If I learn to write well, my language will never disappear."

- Michiguanga man at a Writers' Workshop in Peru

★ ★ ★

Media

"Power will gravitate into the hands of those that control information"

- Zbigniew Brzezinsky

"With iPods and Xboxes and PlayStations- none of which I know how to work- information becomes a distraction, a diversion, a form of entertainment, rather than a tool of empowerment, rather than the means of emancipation."

-Barack Obama, US President

The term media (used as singular) represents all forms of information communicated to large groups of people through hand made signs through international news networks. Mass media includes media such as records, tapes, cassettes, CDs as well as broadcasting media such as radio, TV, cable, film and motion pictures, the internet, mobile phones, satellite and print media such as books, newspapers, magazines and video games. Non-mass media represent person-to-person communications through speech, gestures, telephony, postal mail and Internet.

The history of mass media can be said to have started from ancient times when philosophers, politicians and army commanders in the ancient societies (e.g. Greek and Vedic societies) discussed issues and often spread their messages to the public by the word of mouth. People have been influenced by drama, poetry and religious preaching which form an important component of mass media. The reduction of communication to sculptures on stones and writings on papyrus,

palm leaves etc. enabled the preservation of these discourses, sermons, and literary works etc. marked the beginnings of recorded history. The credit for inventing printing in the 13th century goes to China. But the technology of printing developed in the West by J. Gutenberg (ca. 1400-1468) and William Caxton (1422-1491) enabled Europe to reproduce in print and disseminate ideas. The emergence of roadways, railways, steamships and the postal services speeded up widespread dissemination of ideas in the form of books, newspapers and individual communications over long distances, thus helping the economic growth of Europe and the Americas ahead of Asia.

Sending instantaneous messages through signals began with the visual method of using fire during the nights and sunlight reflected by mirrors during the daytime over distances of 40-100km depending on visibility. This range was extended through the mechanical telegraph system consisting of a tower with movable arms whose position could be read from a distance of 210 km using a telescope. The electric telegraph using the Morse code followed in 1838. It was extensively used by the railways, commerce and other sectors for sending instant messages. Its utility was extended to the navy with the laying of the trans-Atlantic cable in 1858. The telephone invented by Alexander Graham Bell ((1847-1922) in 1876 revolutionized the person-to-person landline communications. By 1910, the world had 7 million land-line telephones. Currently there are 1.3 billion telephones. India has 47.4 million land-line telephones, as against 12 million in 1995.

The projection of the first moving picture was achieved by Thomas Alva Edison (1847-1931) in 1893 through his Kinetograph. The first film performance of the Lumi?re brothers

in Paris in 1895 marked the advent of the cinemas as one of the most important tools of audio visual communication and mass entertainment with substantial impact on arts, technology and politics.

Studies in the 19th century revealed that visible light, using which mankind lived, is but an island of what is called the electromagnetic spectrum of a range of wavelengths. Success in the exploitation of the invisible electromagnetic spectrum was achieved through development of wireless communication using radio waves by Gugliemo Marconi (1874-1937) in 1901. The radio allowed, for the first time, information to flow at rates and across distances previously impossible. The development of radar opened up the microwave region of the electromagnetic spectrum for communication applications. Work on the development of television was initiated as early as 1862 through sending pictures by wire. Microwave technology helped the perfection of equipment for television which entered the market after the Second World War. The satellite technology enabled the TV transmissions across the globe in 1962, making the world a compact village. Satellite TV not only plays a major role as a medium for bringing education to the doorstep of an individual but brings a new dimension to mass media. Events across the world and even in space and beneath the sea which were earlier confined to news reels shown in cinemas could now be watched live by people sitting in their living rooms. Examples of some remarkable events watched live over TV by people around the world were, the impact of the comet Shoemaker Levy on Jupiter (1994), the disintegration of the space shuttle Columbia during its reentry (2003), the US-led missile attacks on Iraq (2003), terrorist attacks on some

landmark institutions such as the World Trade Centre in New York on September 11, 2001 and the Taj in Mumbai on November 26, 2008.

Television watching, the most important and most utilized form of media, has also been dubbed as a "pathogen" and "the opiate of the masses". Children spend more time in front of the TV than they do in the class room. Violent images on television, as well as in the movies, have inspired people take to all sorts of crime. Media violence and vulgar displays of riches are especially damaging the minds of young children, who cannot tell the difference between real life and fantasies. TV characters are often exaggerated stereotypes that often distort children's expectations in day to day life. In earlier times people were aware that certain actions were taboo. Thanks to the TV and other media this awareness is gone. TV has infiltrated personal lives, exercising control over people's minds and changing the way they work, play and interact. It has also become a tool that could create and even ruin celebrities, glorify violence, drugs, orgies and other unhealthy habits. "The unreal world of realty television is robbing the youth of innocence and meaningful ambition." There is also a school of opinion that through the opening up of its lifestyles in television, the western world is imposing "cultural imperialism" on the developing countries with the goal of eliminating their native cultural traditions and identity through replacing them with alien traditions.

Another important application of microwave technology is in the area of mobile phones, which have offered to individuals and the society a convenient communication system and a new lifestyle. The mobile phones enable people to communicate with friends, family and colleagues anywhere. They have a big impact

on the economy, especially in the developing countries through increased exchange of information on trade and health services. According to the 2005 figures, the world has over 2 billion mobile phones as against 1.3 billion landline phones. The number of mobile phones in India (with a population of 1.21 billion) at the end of March 2011 was put at 811.59 million. while number of landline phones was 34.73 million! The number of mobile phones is projected to grow further while the number of landline phones is showing a declining trend! To feed the hunger of consumers, manufacturers are introducing mobile phones with added accessories such as internet, cameras, games consoles and MP3 sets etc. These have become a cause for a decline in people's social behaviour through activities such as sending porn messages and blackmailing. There is also growing evidence that extensive mobile phone use, especially by the younger generation, could have telling adverse health effects. The habit of text messages using mobile phones, which teens are extensively engaged in, is leading to language distortion, anxiety, distraction in studies, falling grades, repetitive stress injury and sleep deprivation,

The development of computers, especially personal computers, has brought a new dimension to the mass media. Sending and receiving e-mail (electronic mail), and searching for information on the Internet has become a familiar feature of modern life by the end of the 20th century. The Internet has become a medium for e-learning, e-business, (including e-commerce and e-banking), and e-governance. The World Wide Web (WWW), an application built on top of the Internet, has transformed our lives in ways we could not have imagined even a few years ago. It has enabled people to create and communicate

their own views without anyone knowing their identity. It has also created a new form of social interaction between the state and the people. The WWW is also turning into a platform for political discourse, as well as venomous outpourings of disruptive forces. Using a web browser one can view web pages that may contain text, images, videos, TV channels, advertisements and other multimedia. The system has become a vehicle for social contacts, maintaining relationships, uploading views and sharing video clips or pictures (e.g. Google, Orkut, You Tube, Face Book, Twitter Blogs etc.) transforming the world into a stage. Media are also contributing to information overload at a rate much faster than one can really assimilate and think deeply in decision-making and judgment. Glued to Internet, e-mails (wanted and unwanted - spam), instant messages, Web sites, and TVs that dish out large amounts of worthless details, individuals are getting disconnected from each other with no personal interaction. Millions are choosing to go public with political outpourings and even most intimate parts of their lives. Websites (e.g. Wikileaks), exposing excessive government and corporate secrecy have also been enabling citizen activists, journalists and others to challenge the state policies. In short, the information revolution is drastically changing the world and paving way for a planetary consciousness and a "global democracy." Internet and mobile phones helped the Arab youth world, which was frustrated with unemployment institutional corruption and lack of political liberty, to be galvanized and spark off the 'Jasmine Revolution' that led to the overthrow of Zane el-Abidine Zardari, the autocratic ruler of Tunisia. This is followed by popular protests in Egypt, Yemen, Syria and Jordan demanding political and economic freedoms. Such expression of dissent is also slowly

sweeping across other autocratic regimes in the region. The Internet has also helped mobilizing public protest against corruption in India, forcing the government to initiate corrective legal measures.

Enabling transactions, booking tickets, or simply getting messages across, the Internet is also playing a bigger and bigger role in the way people live. Glued to Internet and mobile phones people are getting emotional more through the virtual world. Recently a 28 year-old man has helped his wife deliver a baby successfully with online assistance from the popular You Tube site! A Florida teenager committed suicide in November 2008 while people watched the frightening event live via web stream! Peoples' power to bring about changes political power through demonstrations against the state (e.g. the overthrow of the Philippine President Ferdinand Marcos in 1986 and the overthrow of the President of Kyrgyzstan in 2010) have drawn worldwide attention and support through easy access to media (TV, Internet and mobile telephony). Gadgets of all shapes and sizes that provide convenient, functional access to communications, Ground Positioning Systems (GPS), social networking and other information wherever we are, are becoming increasingly available. Added to this mobile cameras that make it easy to click pictures anywhere anytime and distribute them as MMS clips and near naked images of passengers at airport security checks are depriving an individual's privacy. George Orwell, in his dystopian novel "1984" published in 1949 starts with the oft-quoted warning "Beware, the Big Brother is watching you". He perceived a 1984 scenario when the world "would turn into a totalitarian state which has absolute control over every action and thought

of people through propaganda, secrecy, constant surveillance and harsh punishment" This perception has now become a reality with state regimes making use of all modern communication networks, for surveillance of their citizens in name of national security. Employers and security agencies are coming up for monitoring the cyber activities of individuals.

With every individual becoming a potential producer of news of his own version, the quantity of information has risen enormously but the quality has decreased. In a democracy, information plays a powerful role, but in the present scenario of such unprecedented and instantaneous flow of information and misinformation, you can never know whether it will make you better or worse off. Such harmful information spread through Internet and other media is called Information Pollution or Infollution. Social scientists say that the human society is now in the age of information revolution through saturation coverage by television and internet, of entertainment and sporting events, unbridled sexual lusts, rock music, and drug addiction. They are also apprehensive of the adverse effects on youth accessing porn sites. According one study in the US, men who consumed large amounts of pornography were less likely to want daughters and less likely to support women's equality!

The Internet has also unveiled new forms of crime called cyber crimes. A cyber crime is any unlawful act wherein the computer is used either as a tool or target or both for unauthorized access to computers/computer systems/computer networks, for stealing valuable information contained in the electronic form, "data diddling", web jacking, damaging computer systems, robbing etc. The nations' computer networks and the sensitive information stored therein are at the risk of

falling into the wrong hands. Recently computer hackers have successfully penetrated into US Pentagon's network and copied strategic data on the US Defence Department's costliest weapons programme ever. In India the National Informatics Centre servers were infected with virus allegedly originating in China. In the financial sector the most common criminal activities relate to acquiring sensitive information (called Phishing) such as user names, passwords and credit card details for swindling. E-Way robberies, like highway robberies, have now become a common criminal activity! Using information networks such as Internet and cell phones, terrorist organizations have become more and more unpredictable and menacing. For example the 26/11 attack in Mumbai was guided through mobile phones by terrorist posts outside the country.

Great advances in the mass media based on information technology have thus not only produced material abundance in society but have also brought in some negative side effects, economic, social, cultural, psychological and even political.

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Migration

"Migration is a question of supply and demand."

-Jorge Bustamante

Migration of the humans has been an integral part of history. Political, economic and technological developments during this age of globalization have accelerated migration in response to demands for skilled personnel.

Human migration denotes any movement by people from one locality to another, sometimes over long distances or in large groups. Extensive human migration has been occurring at several stages since prehistory times. Homo sapiens moved out of Africa about 70,000 years ago. Migration to the Americas took place 20-25 thousand years ago. Indo Aryan migration to and within North India took place about 2,500 years ago. The Age of exploration and European colonization led to an acceleration of migration with about 250,000 Europeans entering and settling in the Americas. The movement of populations continued under the form of voluntary migration within one region or beyond the nations, as well as involuntary migration (e.g. slave trade of human beings, migration of Jews). In the wake of partition of India in 1947 massive population exchange occurred between India and Pakistan. About 14.5 million people crossed the borders to what they hoped was the country of relative safety. About 7.2 million Muslims moved to Pakistan from India and 7.2 million Hindus and Sikhs moved to India. The newly formed governments were completely unequipped to deal with the migration of such staggering magnitude. Massive violence and slaughter occurred on both sides of the border resulting in the death of people estimated

between 200,000 and 1,000,000. More recent examples of large-scale migration are the movement of Chinese into Tibet, ethnic Arabs into Iraqi Kurdistan, Israelis into the Gaza Strip, and Javanese into western New Guinea. People who migrate are called migrants, or more specifically emigrants, immigrants or settlers depending on historical settings, circumstances.

Slavery, defined as systematic exploitation of labour without consent and/or the possession of human beings as property, can be traced back as an institution to ca. 1760 BC. But the 15th century saw this institution become an instrument of international commerce. Expanding European empires in the New World (e.g. the Americas) lacked a reliable workforce. Europeans were unsuited to the climate and suffered from tropical diseases. The Africans were found to be excellent workers with experience in agriculture and animal husbandry. Used to the tropical climate, they showed resistance to tropical diseases and were useful to work in plantations and mines. The need for such workforce spawned a widespread and organized slave trade over a period of 450 years from the middle of the 15th century. This transatlantic slave trade in which British, European and African traders were involved, led to the transportation of an estimated 11 million West African people, five times as many as the European migrants, across the Atlantic to the Americas. A similar slave trade conducted by the Arab and African traders over roughly the same period from the African continent's east coast enslaved an estimated 9.4-14 million people in the Arab world. New industries were created for processing the raw materials harvested or extracted by slaves in the Americas. Plantation owners profited from the free labour force provided by the slaves. The slave trade contributed

significantly to the commercial and industrial revolution of the 18th and 19th centuries.

With increasing opposition to slavery leading to the abolition of slave trade in the British Empire in 1807, the colonial powers (Britain, Holland, France, Portugal, and Spain) looked for alternate sources of cheap labour. India then under British subjugation became the source for cheap labour. Indians were taken as indentured labour over far-flung parts of the British Empire in the 19th century. The countries where Indians settled and worked include Fiji, Mauritius, Guyana, Trinidad, Surinam, Burma (Myanmar), Malaysia, Kenya, South Africa, and Ceylon (Sri Lanka) and other countries. In course of time many Gujarati traders moved to East Africa and built flourishing trades. In the post World War II period, Indian labour and professionals helped reconstruction of the war-torn Europe while unskilled labour force helped the transformation of the landscape of the Middle East. Indians also had their presence felt in the US, Canada, UK and Australia.

The UN Population Division estimates that the total number of international migrants will touch 215 million in 2010. The top ten countries with migrant population are US (42.8 million), Russian Federation (12.3 m.), Germany (10.8 m.), Saudi Arabia (7.3 m.), Canada (7.2 m.), France (6.7 m.), UK (6.5 m.), Spain (6.4 m.), India (5.4 m.), and Ukraine (5.3 m.). Migrants now make up 10% of the high income countries, up from 7.2% in 1990. The worldwide migrant population is growing at 2.9% every year, says the International Organization for Migration.

Among all the countries in the world, the US, with its rich tradition of permitting immigrants looking for employment

opportunities, is called the "melting pot" of diasporas. According to the data for 2005, the 296.1 million US population comprises Hispanic (42.4 million), African American (38 million), Asian American (13.2 million), Native American (2.9 million) and the rest (199.6 million). The US Census Bureau projects a significant demographic shift by 2050, the whites becoming a minority with the Hispanic, Black, Asian American Indian, Native Hawaiian and Pacific Islanders with higher birth rates and greater immigration outnumbering whites nationwide. Both the number and proportion of whites, which currently account for 66% of US population, are projected to dip to 46% by 2050. At the same time the Hispanic population will rise from 15% to 30%, Blacks from 13% to 15% and Asians from 5% to 9%. The 2010 census figures support this trend by reporting that over the past decade out of the American population growth of 9.7%, the minorities accounted for 92% while the white Americans grew by only 1.2%. With the declining share of the White American population, the face of US is changing, the minorities already constituting a majority in the populous states of California and Texas as well as in Hawaii, New Mexico and even in Washington DC.

It is predicted that by 2060 UK would be EU's most populous country with a population of 77 million, compared to 61 million today. Germany, the current top nation, will see its 82 million citizens dwindle to 71 million over the same period. Britain's boom is fueled by a run of immigration and a comparatively high birth rate, partly a consequence of higher fertility rate among its immigrant population.

According to recent reports, there are 25 million Indians spread across 189 countries. With 11.4 emigrants in 2009 it

occupies position no. 2 after Mexico (11.9 million). (Migration and Remittances Factbook 2011, World Bank). Other top countries that contributed emigrants during the period are Russia (11.1 m), China (8.3 m) and Bangladesh (5.4 m). The Indian diaspora is the most widespread in the world. UAE, US, Bangladesh, Pakistan, UK, Qatar, Sri Lanka and Jordan are the top ten countries with Indian migrants. The Indians are the largest ethnic group in UK, while they outnumber the Chinese in Australia. People of Indian Origin in US number about 1.7 million and represent the second largest Asian group next to the Chinese (2.76 million). The Indian diaspora comprising half a dozen religions and several sub-ethnic identities is more varied than any other diaspora. It also reflects a wide variety of occupational and income patterns from the highest to the lowest in the world. It has also suffered more than any other diaspora (e.g. in East Africa, Fiji, Malaysia and Sri Lanka) barring the Jewish diaspora. It was also segregated from the land of its origin for many decades until India attained independence. Another interesting fact is that India is also an important destination for about 6.1 million migrants, mostly from Bangladesh, Nepal and Pakistan.

Since the 12th century Chinese from mainly southern China migrated to SE Asia. The 20 million Chinese who settled in Indonesia, Thailand, Malaysia, Singapore, Philippines and Myanmar constitute almost 80 percent of the overseas Chinese. The 19th century, when the age of colonialism was at its height, saw the beginning of the great Chinese diaspora migration. America and Australia needed great numbers of labourers for the dangerous tasks of gold mining, and railroad construction. The Chinese workforce that emigrated in large numbers met

this demand. At the end of 1999, there were over 34 million Chinese overseas constituting one of the largest diasporas in the world. The people of Chinese origin currently represent the largest immigrant population entering the US, Canada and Australia. Chinese presence is also rising significantly in Europe, Russia and Africa.

India and China which got US$51 billion each in remittances from its emigrant workforce, account for almost a quarter of worldwide remittance flows of US$325 billion in 2010. Inclusive of the unrecorded flows through formal and informal channels, the true size of remittances could be several times higher. A major part of the remittances to India comes from the semiskilled and unskilled Indian workers employed in the Gulf States and Malaysia.

A matter of great concern is the exposure of the semiskilled and unskilled workers from India and other countries to the dreaded HIV/AIDS infection. About 67% of identified HIV positive cases in Bangladesh are returned migrant workers and their spouses. In Nepal, 41% of HIV cases reported in 2007 were among the migrant workers. Overall in Asia Pacific 7.2 million people are believed to be living with this dreaded infection.

There is an important difference between the overseas Chinese and Indian diaspora. The Overseas Chinese diaspora has helped change the face of their homeland by building powerful business networks that now control significant sectors of the Tiger economies of SE and S Asia (Taiwan, Hong Kong and Singapore). It has also made a tremendous contribution to the economic development of homeland China. The Indian

Overseas Community, while succeeding brilliantly in the US and UK on individual merit, have yet to play a major role in the development of Indian economy to levels comparable to China. Credit should however be given to the highly skilled Indian community settled in the Silicon Valley that helped the Indian software companies break into the American market. Currently these US settlers are evincing interest to return to India and contribute to the country's economic growth..

Illegal immigration has also been on the rise in recent times. Some causes that force people to resort to illegal immigration are- escaping war or repression, family reunification, and poverty. They go out in search of destinations that offer wages higher than those achievable in their home countries. At the end of the Vietnam War in 1970 large numbers of "boat people" arrived in several countries en masse in old and crudely made boats seeking asylum. Recent years have witnessed significant illegal immigration to Europe and US spawning an underground smuggling network through clandestine and dangerous routes, mainly Thailand, outlying territories of Virgin Islands or Puerto Rico, where it is easier to circumvent immigration controls. Immigrants are smuggled in suitcases and ship containers. There are several incidents where people moving in containers were found dead from suffocation. Hundreds of Indians, victims of well-organized underground networks and their agents, are reported to have been trapped in Syria, Malaysia, Thailand, Sri Lanka and Russia, places mainly used as transits for smuggling illegal immigrants for North American and European destinations. In Russian Far East, large numbers of Chinese live and work illegally as traders and labourers. The illegal migrant population in US in 2008 is put at 11 million. The

Hispanic population coming across the Mexico-US border and providing huge manpower to the US contributes 56% to this number (Latin Americans - 22%, Asians - 13%, Europeans - 6% and Africans and other parts of the world - 3%). The large-scale illegal immigration of tens of thousands of Bangladeshis into India through its porous borders in search of jobs in the non-formal sector has become a matter of security concern to India. These illegal immigrants have settled down in several Indian states, including West Bengal, Assam, Bihar, Tripura and even Delhi and Mumbai. This illegal immigration has even significantly altered the demographic complexion of the border states of West Bengal, Assam and Tripura.

For historical and political reasons many countries are made up of a diverse range of cultures and identities. An ideal multicultural society consists of a diverse range of cultures and identities where individuals are neither subjected to tyrannies of compulsive traditions, nor cultural groups subjected to the tyranny of a dominant group. But with external and internal factors contributing to their destabilization, administering multicultural societies is proving more and more difficult. There are instances when the migrant populations suffer from the aggressive acts of the local population. For example the Indo-Fijians, mostly descendents of people who had migrated from India in the 19th and early 20th centuries and comprising about 44 percent of the country's population in Fiji are often the targets of arson and looting. In 1972 the Asian migrant population in Uganda, consisting predominantly of Indian business community, had to leave the country en masse in the wake of repressive measures of the government headed by Idi Amin. But in 1980s the exiled returned to their business empires that

once again dominate the country's economy. The pent up frustration over inequality between Uganda's Asian communities and the blacks is again leading to ethnic violence. Currently the settlers in South Africa who came from Mozambique, Zimbabwe, Malawi and Asian countries are the targets of xenophobic violence. The eight million Indian populations in Malaysia representing 8%t of the country's population feel alienated. The Indian Tamils comprising 12.6 percent of Srilanka's population represent the descendents of the labour force that moved into the island during the 19th and 20th centuries. The Sinhalese majority considers them as an alien group. This has led to an ongoing war between the Sri Lankan government and the Tamil Tigers, in which the latter were liquidated, crippling the economy of the island state and even creating political repercussions in India.

The recent rise in migration rates in the wake of globalization is contributing to the growth of multicultural societies in the host countries leading to collision of cultures. While some countries provide reasonably good examples of more or less well-managed multicultural societies, there are some countries in which the societies remain deeply divided and fractious. Finding ways to build a peaceful society albeit with diverse cultures is their most urgent problem.

The recent economic downturn in the Western countries is making migration a burning issue. The rich economies have begun adding barriers to the flow of skilled workers from foreign lands, on grounds that the migrants are taking away their jobs. "The movement of goods and capitalism is a virtue, but not the movement of people." When the economic recession passes these economies will face the problem of productivity

sustenance especially in the European Union where half of its population will be older than 50 years by 2050 and the share of the population aged 65 and older easing from 14 per cent to 30 per cent. While the migrants are taking away the cream of employment opportunities through their skill and hard work, it must be accepted that immigrants do the jobs which the locals do not accept or are not competent in! For maintaining global growth rate, the rich economies cannot do without a productive, investing and saving immigrant workforce. According to one estimate, if the rich countries were to admit enough migrants from poor countries to expand their own labour force by a mere 3%, the world would be richer by US$356 billion a year. It is however noteworthy that a substantial proportion of the local population in most countries welcomes the idea of immigrants settling down in their countries and helping their economies! As Europe and America age, they will need more young and energetic nurses, housekeepers and cleaners and even higly skilled workers.

The Human Development Report 2009 says that migration. which is on the rise, improves the lives of millions of people. The Report says that 1 billion of world's 6.7 billion (one in seven) are on the move. 740 million of the migrants are internal migrants, while 214 million are international migrants. The global community is becoming connected as never before through "increasing mobility combined with cheaper communications". The internal migrants in India number 42 million. People that move from a developing to a developed country number 70 million. At the same time 3% of international migrants move from a developed country to a developing country.

With their growing economies, India, and China have also become the destination countries for global migration. It is estimated that 20 million foreigners are working and living in India, to meet the country's need for skilled labour. The import of skilled labour has however become a political issue with allegations that a large number of Indians remain unemployed.

For historical reasons India is the most religiously, culturally and linguistically diverse geographical entity, only next to the African continent. As a result, the polity faces several challenges in meeting the increasing demands for preferential treatments to local ethnic groups in diverse fields and at the same time maintaining the development tempo to transform the country into a major economic power. Needless to say that the future of a multicultural society depends on the ability of the sub groups to unite without smothering each other. Ethnic, cultural and religious purity will never happen, even by forcible cleansing.

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Refugees

"While every refugee's story is different and their anguish personal,
they all share a common thread of uncommon courage-
the courage
not only to survive, but to persevere and rebuild
their shattered lives."

- Antonio Guterres

UN High commissioner for Refugees (2005-)

Refugees are defined as people who have been forced to leave their country because they are unable to live in their homes or they fear that they will be harmed. They may also be under threat due to their religion, race or nationality, membership of a particular social group or political opinion. Natural disasters like floods, earthquakes also displace people from their homes. Refugees lose every thing, their belongings, family and even their country when they are forced to leave their homes.

There is also another category of Internally Displaced Persons (IDPs). These are people forced to flee their homes but unlike refugees remain within their country's borders. As many as 105 million people have become IDPs by the so-called development projects including dams, mines, factories and roads and through ethnic rivalries.

The global refugee crisis affects every continent and almost every country. But some areas are more seriously affected. In 2001, 78 percent of all refugees came from 10 areas - Afghanistan, Angola, Myanmar, Burundi, Congo-Kinshasa, Eritrea, Iraq, the Palestinian Territory, Somalia and Sudan. The

Palestinians are the world's oldest and largest refugee population and making up more than a quarter of all refugees. Asia hosts 45 percent of all refugees, followed by Africa (30 percent), Europe (19 percent) and North America (5 percent). The region with the largest IDP population is Africa involving 21 countries followed by Colombia in Central America.

The United Nations High Commission for Refugees (UNHCR) established in 1950, leads and coordinates international action to protect refugees and resolve refugee problems worldwide. Its primary purpose is to safeguard the rights and well being of refugees. It strives to ensure that everyone can exercise the rights to seek asylum and find safe refuge in another state, with the option to return home voluntarily, integrate locally or to settle in a third country. In more than five decades, the Agency has helped an estimated 50 million people to restart their lives. The Agency works in partnership with governments, regional organizations international and non-government organizations. At the end of 2006, the number of "persons of concern" to UNHCR was 32.9 million. These include 9.9 million refugees, 744,000 asylum seekers, 12.8 million IDPs, 5.8 million stateless persons and others.

The Palestinian refugee problem is politically the most sensitive one. This was created in the course of 1948 Israel War of Independence in the wake of the UN deciding to partition Palestine into Jewish and Arab states. The war, which was won by Israel, created a large number of Arab refugees estimated between 520,000 and 800,000 and about 4.6 million displaced persons, Their settlement presents a monumental humanitarian and political problem involving protracted peace negotiations

but with no solution in sight.. The refugee camps housing over one million refugees are located in Gaza, the West Bank, Jordan, Lebanon and Syria.

The late 1970s saw the mass exodus of Vietnamese refugees from the Communist-controlled Vietnam following the Vietnam War. These asylum seekers, called the "Boat People", emigrated en masse in old and crudely made boats that are often not sea worthy. Boats have also been used by people from Cuba, Haiti, Dominican Republic, Morocco, Indonesia and Albania seeking asylum in the US, Canada, Italy, Spain and Australia.

Africa has 3.3 million refugees. The war in the Democratic Republic of Congo, which dragged in at least six foreign countries, has forced tens of thousands of people out of their abodes. Rwanda and Burundi have been torn apart by conflict between the ethnic Tutus and Hutus causing massive population movement into Tanzania. In Sudan some 2.5 million people, one-third of the Darfur population, have been forced to flee their homes after attacks by the Arab militia backed by the Sudanese troops during the ongoing Darfur conflict in Western Sudan.

The conflicts in Croatia and Bosnia-Herzegovina during 1992-95 led to huge migration of people of Serbian nationality to the Republic of Serbia and Montenegro.

In the wake of the Iraqi war there are believed to be well over 4 million displaced Iraqis around the world including some 2.2 million inside Iraq. Continuing violence is forcing an estimated 60,000 Iraqis to leave their homes every month.

About 7.5 million Afghan refugees fled Afghanistan after

the Soviet invasion in 1979 and the conflicts that followed. Bulk of these refugees took shelter in Iran and Pakistan. The UNHCR repatriated more than 4.5 million Afghan refugees from both Pakistan and Iran. As of 2006, some 3.7 million Afghan refugees have been living in neighbouring countries - 1, 5 million in Iran and more than 2 million in Pakistan.

India hosts an estimated 120,000 refugees from Tibet. It is said that there are nearly 500,000 internally displaced Kashmiri Hindus living in the Delhi National Capital Region. Large number of refugees from Sri Lanka moved into India in the wake of the conflict between LTTE and the Sri Lankan government.

More than wars or political upheavals, environmental deterioration through climate changes driven by fossil fuel-based intensive lifestyles, is displacing millions people from their homes forcing them to become what are called environmental refugees, a growing phenomenon of the 21st century. According to an UN study, the rising sea levels, droughts, desertification, floods, tropical storms, and shrinking freshwater supplies, together with associated problems of population pressure and profound poverty will create up to 50 million environmental refugees in the years to come. This number could rise to more than 150 million by 2050. Environmental migration has already been most acute in sub-Saharan Africa (Sahel, Sudan, Kenya, Egypt and Somalia). A United Nations University study warns that Africa may be able to feed just 25 per cent of its population by 2025, if soil degradation on the continent continues at the present rate. More than 600 million people or about 10 per cent of the world population live in low-lying coastal zones worldwide. At least

160 million people in these low-lying areas may be at the risk of flooding from sea level rise and storm surges. Maldives will be submerged, forcing the residents to seek shelter in Sri Lanka and India, parts of which are also vulnerable to such effects. About 20 million people will be affected in India. Low lying areas in the river delta regions (e.g. Godavary and Krishna) could suffer inundation. The population in the Sunderbans, the largest delta region in the world is faced from the threat of sea level rise making about 70,000 out of the 4.1 million population living in the Indian part of the islands homeless by 2020. Bangladesh, one of the poorest countries, expects to have around 20 million people displaced, while up to 10 million could be displaced in the Philippines, millions more in Cambodia, Thailand, Egypt, China and Latin America. UN Habitat's Report on the State of the World's Cities 2008-2009 identified more than 3,000 cities that face the risk of sea level rise and surge-induced flooding. Asia accounts for more than half of these vulnerable cities followed by Latin America, the Caribbean and Africa. By 2070 port cities in Bangladesh (Dhaka), Myanmar (Yangon) China (Shanghai), Thailand (Bangkok), Vietnam, and India (Kolkata, Mumbai, Chennai etc) will have joined the cities whose assets are most at risk. The adverse impacts of climate will be felt most the huge numbers of urban population, especially the urban poor who live in flood-prone and wetland areas. Though it is agreed that the number of environmental refugees will exceed the number of conventional refugees in the coming years, no action has yet been initiated to create an international machinery like the UNHCR to deal with these destabilizing population movements.

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Religions

"When a man is freed of religion, he has better chance to live a normal and wholesome life."

- Sigmund Freud (1856-1939)

"When I do good, I feel good. When I do bad, I feel bad. that is my religion."

- Abraham Lincoln (1809-1865)

"The fact that the robed gentlemen are on good terms does not always lead to goodwill among their folks."

- Economist

"Many have quarreled about religion that never practiced it."

- Benjamin Franklin

"Almost 2,000 years and no new God!"

- F.W. Nietzsche (1844-1900)

Religion is defined in a number of ways. According to one definition, "Religion is any specific system of belief about God, often involving rituals, a code of ethics, a philosophy of life and a world view." A worldview comprises a set of basic beliefs concerning God, humanity and the rest of universe.

Some religious groups believe in one supreme God or deity. This practice is called monotheism. Some believe in a number of Gods or deities, a practice called polytheism. Some practice religions in which no specific God or Gods are worshipped. There are also people who practice their own religious beliefs in their own personal way, largely independent of any organized religion. There are people who deny the existence of God or Gods. They are called atheists. They believe that it is perfectly possible to lead a moral life without belief in God. There are

also people who believe that there can be no proof either that God exists or that God does not exist. They are called agnostics.

Anthropologists and historians say that some form of religion has been practiced since man appeared on Earth about two million years ago. The earliest recorded evidence of religion however dates back to 60,000 BC. Many scholars believe that animism is the first spiritual concept of humankind. This concept, which underlies all subsequent religious thoughts, represents the belief that nature has soul and that things in nature, such as trees, mountains and the sky have souls of consciousness, that a supernatural force animates and organizes the universe and that people have spirits that do and can exist separately from their bodies. A large number of people still subscribe to this concept.

Currently there are 3,300 different religious denominations, faith groups, tribes etc. The top religions in the world today are Christianity (2 billion), Islam (1.57 b), Hinduism (850 million), Buddhism (376 m), Animism and Tribal religions (300 m), Sikhism (23.8 m), Judaism (14.5 m), Confucianism (6 m), Jainism (4.9 m), Chinese folk religion (3.9 m), Shintoism (2.7 m) and Taoism (2.7 m). Christianity, Islam (sometimes Baha'i Faith too) and Judaism are grouped together as Abrahamic religions {After Abraham (1900 BC) - founder of Judaism}. Hinduism, Buddhism, Jainism and Sikhism are classified as Indian religions while Chinese folk religions, Confucianism, Shintoism and Taoism are classified as East Asian or Chinese religions. Hinduism differs from all other religions in the fact that it does not have a single founder.

Many of the large religious institutions (e.g. Christianity,

Hinduism and Islam) have, over periods of time, sub-divided into more than 250 sub-groups or separate religions. "Religions are not born from scratch. They grow from one another." The main reasons for these sub-divisions are not only due to differences in faith but also due to social, political, cultural and environmental factors. For example, Protestantism was the result of spiritual opposition to the luxurious lifestyles of the Pope in Rome. The fundamental division of Islam into Shia and Sunni sub-sects arose over political disputes with the Caliphate. Buddhism and Jainism were founded due to opposition to the claims of Hindu priesthood to spiritual and social supremacy.

Hinduism, the dominant religion in India, Nepal and parts of Sri Lanka, is considered as one of the oldest (ca.1500 BC) world religions. It does not have a single theological system or a guiding single apex organization. It consists of thousands of faith groups that have evolved over centuries. A polytheistic religion, Hinduism is traditionally the world's most tolerant religion with a secular outlook. Some recent events in India however are leading to a decrease in the level of religious tolerance. India has a multiplicity of religions, According to 2001 figures there are about 850 million Hindus in India, comprising 80.4 per cent of the country's population. Islam accounts for 160 million (about 13 per cent), followed by Christianity (2.34 per cent), Sikhism (1.87 per cent), Buddhism (0.77 per cent) and Jainism (0.41 per cent). The balance accounts for Judaism and other faiths. Christianity is said to have arrived in India even before it reached Europe! Indonesia has the largest Muslim population (203 million) followed by Pakistan (174 million).

There have been several situations when religion and state

have been closely interlinked. One typical example is the Church of England with the British monarch empowered as "Super Governor". Several countries in Europe and Latin America adopt the Roman Catholic statutes as their state religions (also official religions). Many Islamic countries around the world have given official status to Islam. Some countries even enforce Sharia Law (Islamic religious law). Some countries have adopted Buddhism as the state religion (e.g. Thailand). At the same time several countries have not given official status to any religion. The Indian Constitution declares India as a secular state that upholds the right of citizens to freely worship and propagate any religion and faith.

A recent report by Pew Forum on Religion and Public Life says that nearly 70 per cent of the world's population lives in countries with 'high' or 'very high' religious restrictions. The countries include even those that have laws of constitution calling for freedom of religion. India, a secular republic, is placed second to Iraq in social hostility and religious bias perpetrated by individuals and groups. In the matter of government imposed restrictions India is placed among the worst 40 out of 198 countries surveyed. Fears are also expressed that with the rise of militancy among the majority community, secularism is in jeopardy in India, with the Indian society moving away from a secular republic towards a type of "ethnic democracy", with the minorities being treated as second-class citizens.

Many religious battles have been fought since 70 AD when the Romans destroyed the Temple of Jews. The causes of these religious conflicts are mostly political rather than ideological. The best known are, the battles of Crusades of the 11th century

when the European monarchs fought the Islamic armies to forge a Christian Empire in the Holy Land, the civil wars in France in the concluding parts of the 16th century and the Muslim invasions of India from the 11th century. Currently the Palestinians are at war with Israel.

Christianity and Islam are the major religions which have passion for conversions. Buddhism also witnesses moderate levels of conversions. Though the scripture forbid forced religious conversions, there have been numerous instances of large scale forced conversions to Islam over centuries, especially in the lands invaded and occupied by Muslim invaders (e.g. Africa and India). Conversions to Christianity also have taken place in parts of Asia and Africa colonized by European powers. "The conquerors bring in their own languages and religions." It is even argued that such civilizational origin of religious pluralism is the cornerstone of India's enduring composite culture rooted in its religious practices. Amartya Sen says that the greatest danger to this unique religious pluralism comes from "the violence fomented through the imposition of singular and belligerent identities on gullible people by proficient artisans of terror."

Religious conversions have been a hot issue in India since the Muslim invasions in the eleventh century. The activities of the Christian missionaries in the North-East states and Orissa during the last century have led to an extraordinary transformation of the religious profile of their populations, with entire families embracing the Christian faith. Incentives such as education and civic amenities as well as pecuniary and social inducements play a crucial role in these conversions. The growth

of Hindu revivalist movements against these conversions is currently a cause for law and order problems.

An ongoing burning issue is the terror of religious fundamentalism, a political ideology calling for the replacement state laws with religious laws (e.g. Sharia law in the Swat Valley in Pakistan). Religious fundamentalism is "not much of an ideology as it is an attitude - an attitude of intolerance in civility and narrowness." The fundamentalists, to whichever religion they belong, fear change, modernization and loss of influence. Fearing a future they cannot control, they remold their religious world into a regressive domain from which they launch their attacks on every aspect of modernity, both in political and social spheres. This fear motivates them to take to violence and terrorism. If a person who happens to be from another religion shows them up, they are much more likely to become aggressive than if a person from their own religion says the same thing. There is also a view that hard secularism without learned, responsible religious leadership could promote religious fundamentalist forces. The events in Turkey in the aftermath of Kamal Ataturk's actions and the events in Iran following the actions taken by Shah Reza Pehlavi in 1935 are quoted as pointers to such developments.

All religions begin by teaching universal love. Ironically they end up - to some extent - preaching and practicing hatred and intolerance of those that belong to other religions. "We have just enough religion to make us hate, but not enough to make us love one another" (Jonathan Swift, 1667-1745).

In recent years, religion has become woven more deeply into the fabric of partisan politics than ever before. Religion

has become more political and politics more religious, with politicians treating religious belief as an issue rather than as a powerful social resource for good behaviour. It is not religion that sparks clashes; it is politics of people that use religion for their own ends. Theopolitics has become an important component in the political milieu of our turbulent world. "When religious leaders get hold of political power, things go bad quickly", observes Phillip Pullman, the author of the best seller, The Good Man Jesus and The Scoundrel Christ.

Religious orders are also rocked by scandals. When individuals join and rise within a mighty and venerable religious order, they come to think that, as part of the establishment. they can resort to any amount of abuse without any risk. In recent months the Catholic Church has been rocked by a series of explosive scandals (child abuse) involving Roman Catholic orders across the world. Yet another matter of concern is the exploitation- monetary and sexual – by the so-called godmen claiming to possess supernatural powers. Abject poverty, illiteracy and superstition (even among the educated) have transformed India into a breeding ground of such fake godmen, some of whom are even patronized and protected by politicians. Such scandals are prevalent in other religious orders too. It is not religion per se that is the cause of the problems but the institutional orders.

A more significant development is a steady rise in those claiming no religious affiliation. A study undertaken by the Research Corporation for Science Advancement found that in "a large number of modern secular democracies there has been a trend that folks are identifying themselves as non-affiliated with religion." The countries studied were, Australia, Canada,

Czech Republic, Finland, Ireland, the Netherlands, New Zealand and Switzerland. The team concludes that in all the countries, the indications were that religion was headed towards extinction.

Dr. S. Radhakrishnan (1888- 1975), the great philosopher statesman, in his book "An Idealist's View of Life" (1932), observed "Nothing is so hostile to religions as other religions…. The world would be a much more religious place if all religions are removed from it." Benjamin Franklin (1731-1813) mused, "If men are so wicked with religion, what would they be without it?"

"At least two thirds of our miseries spring from human stupidity, human malice and those great motivators and justifiers of stupidity and malice, idealism, dogmatism and proselytizing zeal on behalf of religious or political idols."

- Aldous Huxley (1894-1963)

It is unfortunate that the religious orders are not striving to provide comfort to populations around the world who are struggling to find security and identity in this rapidly changing world beset with problems of food security, energy security, environmental degradation, religious fundamentalism and fear psychosis. The only religion that could possibly provide succour is animism, the most primitive of all religions.

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Resource Consumption

"We inhabit a single planet but live in several worlds. There is world of abundance where plenty brings pollution. There is a world of want where deprivation degrades life. Such a planet cannot survive in harmony with nature and the environment or indeed with itself. We must therefore ensure that the affluence of some is not derived from the poverty of many."

- P.V. Narasimha Rao
Address to Earth Summit, 1992

Resource consumption has become a vital component of demographic trends during the last century, with the growing population and technology acting as major players.

The capacity of the early man was limited to his muscle power used for gathering food and defending himself against wild animals. With time his needs increased and his interventions became more complex and widespread through exploitation of technology. Large areas of forests were cleared for agriculture, timber harvesting, animal grazing, fuel wood gathering, mining and industry and for human settlements. Vast stores of energy, almost entirely in the form of fossil fuels (coal, oil and gas) have been harnessed to reshape the earth through clearing and ploughing land and building highways, ports, townships and airports, digging up minerals and building vast factories for production of machinery and consumer products. As a result the per capita energy consumption of the technology man rose to 11.13 kilowatts per day as compared to 0.1 kilowatt per day consumed by the early man.

Record level of resource consumption by the global population 7.0 billion is putting great strain on the ecosystem services upon which all life on the planet depends. With the humans consuming 20 per cent more natural resources than the earth can produce, the world is heading for an ecological crisis. More than three quarters of the world's people live in nations where consumption has outstripped their country's capacity to produce natural resources. About 50 countries are currently facing moderate or severe water stress. The number of people suffering from year–round or seasonal water shortages is expected to increase as a result of climate change caused by excessive consumption of greenhouse gas emitting energy and other resources.

Consumption of fossil fuels (oil, coal, and gas) increased by almost 700 per cent between 1961 and 2001 and is rising further. Projections indicate that oil output will reach a peak by 2030 and decline thereafter, presenting the world with unprecedented energy management problems for oil dependent economies. The consumption of metals has been mounting to a point where viable reserves of important metals such as iron, copper, zinc, nickel and cobalt are rapidly dwindling. Excessive use of synthetic fertilizers is causing eutrophication of water resources.

A more disturbing feature is the growing inequalities in the consumption levels in different countries. The developed countries are characterized by high industrial production and resource consumption. Only 25 per cent of the world's people live in the developed countries. Yet they use 80 per cent of non-fuel minerals. For supporting their lifestyles some developed countries import resources such as food (including marine food),

wood, cotton, minerals and other products from the underdeveloped countries. The US with only 5 per cent of the global population uses 30 per cent of the world's natural resources. Other developed countries also consume natural resources to a far greater extent than an equitable distribution would allow. With their dominating power in international trade the richer countries underpay the poor less developed countries for these resources. The poor less developed countries are forced to sell their natural resources to the developed nations at uneconomic prices to earn the capital necessary for their own economic development

The rain, it falleth on the just
As well as on the unjust fella;
But it falleth more on the just
Because the unjust stealeth the
Just's umbrella! -Anon

In the wake of globalization several developing nations such as China, India and Brazil, have now become part of the resource consuming group of nations. Despite their low per capita consumption the Asian giants, China and India with a population of 2.5 billion (nearly 40 per cent of the world population), are bringing heavy pressure on natural resources. The Worldwatch Institute says, "If China and India, each with more than a billion people, were to match by 2030 the per capita use of resources of Japan, together they would require a full planet Earth to meet their needs". This is due to the fact that these countries are following the developed nations on several fronts especially in the use of fossil fuels. China, which was till now managing with internal oil sources, is now the world's largest importer of oil. It has also surpassed the US in the

consumption of grain, meat, coal and steel except oil. In 2004 China consumed 382 million tons of wheat compared to 278 million tons the US consumed. In the same year Chinese ate 63 million tons of meat, 37 million tons more than the US. In 2008, China consumed 26 per cent of world crude steel, 32 per cent of rice, 37 per cent of cotton and 47 per cent of cement. If China's per capita grain consumption were to double to roughly European levels, China alone would require nearly 40 per cent of today's global grain harvest.

India, like China is also on the path of higher resource consumption. Great damage is being caused to ecosystems through depleting ecological assets in support of the economic boom. The country with its growing population needs the biocapacity of two Indias to provide for its consumption. The amount of land and sea area required to produce the resources it consumes and absorb its wastes has doubled since 1961. All its major river systems are polluted.

The inequality in income between the rich and the poor at the global level is also a matter of concern. Currently the richest 20 per cent of the people in the world accounts for three quarters of the world income while the poorest 40 per cent accounts for just 5 per cent. The ratio between the average incomes of the top 5 per cent in the world to the bottom 50 per cent increased from 78 to 1 in 1988 to 114 to 1 in 1993. The Economist says that a quarter of America's total income is earned by the top 0ne per cent! In a recent report the ILO observed that despite strong economic growth that produced millions of jobs since the 1990s, income inequality grew dramatically in several regions of the world with more than 80 per cent of the world's population living in countries where income disparity is

widening. For example, in the US in 2007 the Chief Executive Officers of the 15 largest companies earned 520 times more than the average worker - up from 360 in 2003. Between 1990 and 2005 approximately two-thirds of the 73 countries studied experienced an income inequality. The incomes of richest households have increased relative to those of the middle class and poorer households. A major part of the world's population lives in the poorest regions of less affluent countries (e. g. India, China and Africa)

Poverty is measured in terms of income in cash or kind a family or a person requires to meet the basic needs of food, clothing and shelter. Till now absolute poverty income threshold is fixed at US $1 a day by the World Bank (WB). Now this value has been raised US $1.25 a day. The WB in its report published in August 2008 states 1.4 billion people live at this poverty line and below. This is more than the previous estimate of 984 million with the older measure of US $ 1 a day in 2004. Reports say that the poverty rate for India has come down faster between 1981 and 1990 (59.8 per cent to 51.3 per cent over 10 years) than between 1990 and 2005 (51.3 per cent to 41.6 per cent) over 15 years. But in absolute numbers the Indian poor have gone up from 421 million to 456 million from 1980 to 2005. The Indian poor constitute 33 per cent of the global poor. People living in India below US $ 2 a day are put at 828 million or 75.6 per cent of the population. China's poverty rate fell from 85 per cent to 15 per cent or by over 600 million people over the same period. China thus accounts for nearly all the world's reduction in poverty reduction. With China excluded, world poverty fell only by about 10 per cent. For Sub-Saharan Africa the poverty rates are virtually unchanged over the period

1981- 2005. The WB predicts that at the present rate, this region may be home for one-third of the world's poor by 2015. The current economic downturn and price rise in food and other essentials are raising poverty levels the world over.

The ILO is of the opinion that excessive income inequalities could lead to higher crime rates, low life expectancy and in the case of poorer countries, malnutrition. There is also a perception that globalization does not help the majority of the world population. The recent boom has privatized the gains while the subsequent recession socialized the losses with a few rich individuals gaining and all the tax payers losing, leaving people wonder how liberal trade could increase global prosperity!

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Urbanization

"Man is by nature a city beast"

- Aristotle (384 BC- 322 BC)

A city can be defined as a large concentration of population with varied economic and cultural functions. Cities have appeared in diverse civilizations dating back to pre-Christian era, e.g. Mesopotamia (3500-2000 BC), Egypt (ca.3100-1070 BC), Indus Valley (ca.2500 BC), China (1122-256 BC), Greece (ca.800-338 BC), Maya (ca. 1000 BC) and Rome (27 BC). In all these civilizations the cities were the centres of change and development. Thus the history of ancient Europe is that of the Greek cities of Babylon, Athens and Sparta and the Italian city of Rome. The city of Mohenjo Daro was the seat of Indus Valley civilization, and Anuradhapura in Ceylon (now Sri Lanka) was a great Buddhist Centre. Rome, the seat of the Roman Empire, was the first city to reach a population of one million during the time of Jesus Christ. With the decline of civilizations these cities also were in eclipse. The eleventh century saw the resurgence of cities and by the thirteenth century all dynamic activity was centred in cities such as Milan, London, Paris and Hamburg. Among these, the city of London was the first to record one million population in 1800.

The giant modern city or urban agglomeration or a mega city with a population exceeding ten million, is essentially a twentieth century phenomenon. It is a product of Industrial Revolution, which fostered economic and technological growth. The growth of such cities is currently a global phenomenon of escalating rates and scales, involving the migration of people from rural areas, transforming the face of the world. In 1900

there were only ten mega cities, all of them in the industrialized countries. By 2000 this number has grown to 24 with 18 of them in the developing countries. In 1800, just two percent of the world's population was urbanized. By the year 1900, fifteen percent of the population (about 250 million) lived and worked in urban areas. Over the next 100 years, this figure shot up to 2.8 billion or almost 49 percent of the world population. By the end of 2008 the number of urban dwellers will have surpassed the rural inhabitants for the first time in history. The total world population is expected to rise to 9.2 billion by 2050. Out of this, 6.4 billion people (about 70 percent) will be living in the cities. As urbanization increases, the world's total rural population is expected to decline to around 2.8 billion in 2050 from 3.4 billion in 2007. Asia and Africa are still mostly rural but will see escalating urban population over the next few decades. Half of Africa's population will be in cities by 2045 - 2050 while Asia will reach this point earlier by 2020 - 2025. At the global level all future population growth will be in cities and towns. "The urban population is no longer the tip of the iceberg but the iceberg itself!"

The vast and heterogeneous Asia-Pacific region containing populous countries of China and India with large economies is home to three fourths of the world's population with half of its urban population and 11 of the largest cities in the world.

China is now at the peak of urban transition. Around 40 percent of China's population is in cities now. It is officially estimated that some 18 million people migrate from rural areas to cities every year. By 2050 one billion people will be living in Chinese cities. This unprecedented rate and scale of rural-urban migration is the cause of a variety of social and

environmental problems. The cities currently number more than 660 with 139 cities having 750,000 or more people. Many of these cities are located in the low lying coastal zone and are vulnerable to submersion by rising sea levels from global warming.

A March 2010 UN report says that the world's mega cities are merging into vast "mega regions" which may stretch hundreds of kilometers across the countries linked both physically and economically and be home to more than 100 million people. The largest mega region is the Hong Kong-Shenzhen-Guangzhou region in China, home to 120 million people. The Nagoya-Osaka-Kyoto-Kobe in Japan is projected to grow to 60 million by 2015. The Rio de Janeiro-S?o Palo region in Brazil has 43 million people. The same trend is on even on a larger scale in some fast growing urban corridors. In West Africa 600 km of urbanization linking Nigeria Benin, Togo and Ghana is driving the entire region's economy. In India the Mumbai- Delhi industrial corridor is taking shape in a big way. It is a mega infrastructure project of US$ 90 billion with financial and technical aid from Japan covering over a length of 1483 km between Delhi and Mumbai passing through six states-UP, NCR of Delhi, Haryana, Rajasthan, Gujarat and Maharshtra. The project comprises nine mega industrial zones of about 200-250 sq. km, high speed freight line, three ports and six airports, a six-lane intersection free expressway connecting the country's financial capitals and a 4000Mw thermal power plant. A similar corridor connecting Delhi with Kolkata is in the pipeline. These corridors will spawn a large number of urban conglomerates. In East Asia four megalopolises and 77 separate cities of over 200,000 each cover

Beijing and Tokyo via Pyongyang and Seoul. The phenomenon of the so-called "endless city" could be one of the significant developments and problems in the way people live and economies grow in the next fifty years. Experts say that an urban sprawl is the symptom of a divided and dysfunctional city. It is not only wasteful. It adds to transport costs, increases energy consumption, requires more resources and causes loss of prime farmland.

India has over 300 million (29 percent) of its population in cities at the moment. By 2030 this number will rise to 590 million (about 59 percent). There are four mega cities (Delhi, Kolkatta, Mumbai and Chennai) with populations exceeding 10 million, about 40 cities with populations exceeding 1 million and 393 cities with populations greater than 100,000. Three of the mega cities (Mumbai, Kolkata and Chennai) lying in coastal belt face the danger of submersion from the rising sea levels due to global warming. The smaller cities are projected to grow very fast in the next two decades. A study by McKinsey Global Institute predicts that in the next two decades over 10,000 villages will become small towns with populations of less than a million; 26 with less than a million small towns will join million-plus league and 4 cities will join the 4-million plus super league. Poorly provided with housing, health infrastructure, transportation, drinking water, waste disposal and other services, these cities will face several hardships. Five states- Tamilnadu, Gujarat, Maharashtra, Karnataka and Punjab are likely to be more than 50% urbanized. About a quarter of the poor or more than 80 million, now live in crumbling cities and towns. Within 20 years, half the poor may live in urban India.

The top 25 cities in the world account for more than half

of the world's wealth. The five largest cities in India and China now account for 50 per cent of these countries' wealth.

Another manifestation of the burden on the urban infrastructure is the proliferation of slums, the crowded clustered settlements of poor migrants from rural areas in search of employment. Their numbers grow daily as poverty in the villages drives them to the cities in search of employment opportunities. About 90% of the slum dwellers live in the developing countries with China and India accounting for over a third. These slums are characterized by crowded semi-permanent structures, squalor and no access to water and sanitary facilities. They invariably come up on the land demarcated for public utilities, plains prone to flooding, steep hill slopes or areas close to hazardous industries. In 2001 the slum population in India was estimated at 41 million. It is projected to rise to 69 million by 2017. Half of Mumbai's population lives in slums. In Delhi 45 percent of the 14 million population live in rural villages, slums and clusters of huts and lack even the most basic amenities. Most of the slum dwellers are either unemployed or underemployed in petty and miscellaneous activities in what is known as the non-formal sector. The slums are areas of discontent and social problems such as drug traffic, crime, prostitution and ethnic rivalries leading to periodic violent outbursts. A clear youth bulge marks the demographic profile of the slum populations. Millions of street children, who live in poverty and in conditions that threaten their health, safety and education and prospects, form an integral part of the urban slum scene.

Another outcome of urbanization is the fast rise in the number of lonely people as a result of the replacement of joint

family with nuclear family and the absence of interaction with family members or with society. This leads to bouts of depression and a sense of isolation. It is a rare phenomenon in our urban culture where a person spends a lifetime surrounded by relatives and friends.

Increasing urbanization, coupled with slow economic development and globalization has facilitated revivalist religious adherence in varied forms and reinforced stratification of subcultures. Such varied manifestations are rapidly changing the political dynamics and social identities of people, leading to inter-group and interpersonal rivalries and insecurity, particularly in urban areas of poorer countries.

The urban youth bulge of the twenty-first century presents both a challenge and an opportunity. Investing in urban children and youth and helping them to integrate themselves fully into society is a matter of social justice and is the key to realizing potential economic prosperity and ensuring urban security.

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Wages of Growth

"We have an economy where we steal the future, sell it in the present, and call it the GDP."

- Paul Hawken

"There is no dignity quite so impressive and independence quite so important, as living within your means."

- Calvin Coolidge

US President (1923-29)

Anthropologists believe that the human species, the latest in the evolutionary chain, emerged on planet Earth about three million years ago. Their number was 280 million in 1000, 1 billion in 1800, 2.5 billion in 1950 and currently 7 billion. Increasing by 200,000 per day, this number is projected to reach around 9 billion by the middle of this century. In the past four decades more people have been added than in all history. Apart from the human species there have never been on the planet 7 billion of any single species weighing in at more than 30kg each!

When their numbers was in millions and local resources for subsistence became sparse, people could simply move to new pastures. But with the projected 9 billion people occupying every corner of the globe (house full!), moving is no longer an option. A stage has been reached when human society should begin deliberating whether the planet can sustain such a huge number.

Concern about the availability of the food resources to meet the demands of the rising population (in Europe) was expressed

about 200 years ago by Thomas Malthus. He wrote, "The power of population is definitely greater than the power in the earth to produce subsistence for the man." Vast land (e.g. Americas, Asia, Africa and Australia) and ocean resources were opened up at the time through the voyages of discovery. These developments helped Europe tide over the danger. Major advances in agriculture and industry in the wake of the Industrial Revolution also helped exploitation of natural resources. Developments in healthcare facilitated fall in mortality and rise in longevity leading to growth of human population. With the skills acquired through science and technology, people built vast empires and economic systems by exploiting the seemingly infinite rich natural resources. Between 1750 and 1965, global industrial output increased hundredfold and forty times since 1965. Life expectancy rose from 47 years in 1950-55 to 68 years in 2005-10. as a result of improved healthcare. It now ranges from 63 years in the low-income countries (e.g. Pakistan) to 83 years in high-income groups (e.g. Japan). The life expectancy in India which is put at 65 years in 2009 represents a 50% rise over the value in 1960. Science has also given the humans the power to even tweak life systems (e.g. genetic engineering). Science and technology have also give the humans the power to develop destructive weapons to destroy themselves. Global industrial output, which in terms of Gross Domestic Product per capita (GDP) rose 14 times, helped phenomenal rise in living standards. But the benefits of this growth were skewed in favour of the technologically developed nations with the developing nations which account for 40 per cent of the global population living in poverty. In the wake of phenomenal changes through the globalization of economy, developing and populous countries like China, India and Brazil also joined the

growth path as partners and beneficiaries of global commerce. They became avid consumers by embracing the lifestyles, which were till recently the exclusive preserve of the developed nations. These changes characterized by consumerist culture are leading to resource base exploitation at staggering rates turning the globalization era into consumerist era. Many governments and individuals worldwide have not been living within their means and as a consequence have been piling up enormous debts. In short, the world is changing rapidly and becoming increasingly complex, disordered and polluted. Economies are in disarray, conflicts are al too frequent, the ecosystem is in a state of distress and lives are becoming more hectic and uncertain.

The adverse effects of increased technological efficiency that supports population growth and higher levels of consumption of limited natural resources were pointed out as early as 1865 by W.S. Jevons by citing coal, the energy source of the time, as an example. This activity persisted unabatedly till 1970s, when the realization dawned that not only many precious natural resources were getting depleted faster than they could replenish but their unfettered use is causing irreversible damage to the environment. A monumental study by a group of 31 scientists, educationists, educationists, economists, industrialists and government officials, known as The Club of Rome undertook a detailed study on the subject. Using computer models the Club examined the consequences of unchecked population growth and resource utilization for the period 1900-2000, and published its results in 1972 in the form of a book, The Limits to Growth. Echoing some of the concerns and predictions of Malthus, the Club observed, "If the present growth

trends in world population, industrialization, food production and resource depletion continue unchanged, the limits to growth on the planet will be reached sometime in the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline both in population and industrial capacity. It is possible to alter these growth trends and establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on the earth are satisfied and each person has an equal opportunity to realize his individual human potential." In short the world was cautioned, "We can no longer live on the new earth as if it were the old earth."

The UN General Assembly constituted in 1983, the Brundtland Commission to address the growing concern "about accelerating deterioration in human environment and natural resources and the consequences of that deterioration for economic and social development." After an intensive study, the Commission presented its report under the title Our Common Future in which it invoked the concept of "sustainable development" defined as "an approach towards meeting the needs and aspirations of the present and future generations without compromising the ability of the future generations to meet their needs." Ms Gro Harlem Brundtland, the chairperson, observed that sustainable development "is a concept that can mobilize broader political consensus, one on which the international community can and should build. It requires political reform, access to knowledge and resources and a more just and equitable distribution of wealth." Jim McNeil, one of the members of the Commission envisaged "a new era of

growth, not the type of growth that dominates today, but sustainable growth - growth based on forms and process of development that do not undermine the integrity of the environment on which they depend."

Thirty years after the publication of Limits to Growth, a new study, Limits to Growth: The Thirty Year Update (2004), reported little change in the trend. The authors lamented that "the humanity is dangerously in a state of overshoot" and that it "has squandered the opportunity to correct our current course over the last 30 years and much must change if the world is to avoid the serious consequences of overshoot in the 21st century."

Around the time the Club of Rome was engaged in its exercise, the well known ecologist Paul Ehrlich, along with John Holdren, highlighted the danger of relentless resource consumption in terms of a simple equation (called the Ehrlich equation)

$$I = P \times A \times T$$

The equation says that the impact (I) of human activity on the planet is the product of three factors: the size of the population (P), the level of affluence (A) of the population and the technology factor (T), which is the impact of each dollar spent on the planet. Lowering the impact (I) due to growing consumption (P x A) requires that the technology factor (T) of production must be reduced or its environmental efficiency must be improved. Overall the equation says that population rise coupled with resource consumption and technology has an adverse impact on the quality of the environment. In other words a society that develops technologies and consumer-oriented markets without consideration for environment ends in a

collapse. This equation now forms the basis for the social and natural scientists for studying the interactions between population and economic growth, resource consumption, agriculture, energy, technological and environmental factors.

In the concluding decades of the 20th century, economists recognized the need to account for the adverse environmental costs brought about by indiscriminate resource consumption in the name of growth. They also warned that the concept of limitless resources is a fool's dream, and that for preserving environmental and societal security there is a need to instill restraint in resource use in the name of growth. To this end they developed a new discipline called environmental economics that focuses on an integrated approach to development, environment and ethics, through reconciling economic growth with resource conservation and environment protection. This, according to them, can be achieved by defining suitable conditions for sustainable development through establishing a delicate balance between improved lifestyles and a feeling of well being on the one hand and protecting natural resources and ecosystems, on which the present and future generations depend.

Nicolas Sarkozy, the French President also took the initiative in this direction and constituted an International Commission on the Measurement of Economic Performance and Social Progress to spell out better measures of economic performance in a complex economy that is currently based on quantitative growth. The members of the Commission were the reputed economists J.Stiglitz and Amartya Sen, assisted by several experts. The Commission concluded that any good measure aimed at growth must also take account of

sustainability as well as quality of life and that, "just as a firm needs to measure the depreciation of its capital, so too, our national accounts need to reflect the depletion of natural resources and degradation of our environment." Stiglitz cautioned, "GDP statistics were introduced to measure market economic activity. But they are increasingly thought of as a measure of social well-being, which they are not."

Ironically these warnings are yet to have an impact on the governments, who continue to pursue the path of growth (touting it as development) measured in terms of quantity (GDP) and not quality. A government that fails to achieve the promised quantitative growth will soon find itself voted out of office! As a consequence, nations are splurging their resources as if the limits to growth were far enough away that they would be someone else's problem. This culture, which is destroying more than it was creating, is driving the global economy and the human imprint on the environment to a flashpoint, turning the beautiful sounding idea of sustainable growth "intellectually bankrupt". With the overpopulated human species currently extracting an estimated 60 billion tonnes of raw materials from the Earth each year - 50 per cent more than 30 years ago- life support systems have been adversely affected. Several synthetic chemical products, which eventually enter the environment, are also causing damage to life support services. Even with modest projections for population growth, resource consumption and climate change, humanity will need by 2030 the capacity of two earths to keep pace with current rate of resource consumption.

In an article published in September 2009 in the reputed journal Nature, a team of environmental specialists headed by

Johan Rockstram of the Stockholm Environmental Institute warned that "Human activities have reached a level that threatens the systems that kept climatic conditions over the last 10,000 years in a remarkably stable condition suitable for the growth of human civilizations". The team identified nine clear lines "in the sand" (planetary boundaries or Laxmana Rekhas) that must not be crossed if humans are serious about saving the planet. These are - climate change, fresh water use, pollution, ozone depletion in the stratosphere, land use change, ocean acidification, fresh water use, nitrogen and phosphorus cycles, aerosol loading and chemical pollution. They observe that in the case of three boundaries - species extinction, human induced climate change through fossil fuel use, and the disruption of nitrogen and phosphorus cycles - the acceptable limits have already been crossed. They conclude that these activities, if not checked, would push the earth system outside the stable environmental state "with consequences that are detrimental or even catastrophic for large parts of the world."

Climate change through global warming will put great stress on water resources which are already under stress through rising demands from the growing population and economic boom and land use. Many parts of the world, where one major river supplies water to multiple countries, are turning into political hotspots. As a result of the withdrawal of staggering 2,600 cu. km of water annually from rivers, lakes and aquifers for irrigation (70%), industry (20%) and domestic use (10%), many large rivers have diminished flows, and some of them drying up altogether, and ground water sources are getting depleted. South Asia with more than a sixth of the world population will be most affected by global warming through

widespread water mass losses from the melting glaciers and reductions in snow cover in the mountain ranges of Hindu-Kush and the Himalayas. Recently ISRO reported that its satellite survey by Resourcesat-1 over a period of 15 years (1989-2004) showed that 75% of the Himalayan glaciers have retreated over an area of about 3.75 km on average. The Alps glaciers in Europe are receding even faster. Added to this, the increasing frequency of heavy precipitation events followed by heavy floods, and droughts and other disturbances in weather systems will add to people's woes. Producing food to meet the demands of the rising population will be a daunting task in the coming decades because of rising temperatures, as well as land and water source degradation through extensive use of industrial fertilizers. Global warming would cause a sea level rise of 30 to 70 cm. enough to displace 150 million people from the low-lying fertile coastal areas (including mega cities like New York, Shanghai, Mumbai, Kolkata and Dhaka) the world over by the end of the 21st century. Scientists apprehend that an accelerated irreversible climate "tipping point" could occur within the next 20 years as a result of the release of billions of tons of plant matter frozen for thousands of years in the vast permafrost region of the Arctic, and the entry into the atmosphere of an estimated 190 billion tons of carbon dioxide and methane into the air. As the oceans are increasingly turning acidic with the ebasorption of carbon dioxide, coral reefs that harbour the world's richest marine ecosystems are facing extinction threat.

Biologists say that we are living in the midst of a species mass extinction era on par with other great extinction events in history. Humankind already commandeers 35 per cent of the planet's land surface for crops and pastures, causing biodiversity

loss and irreversible damage to the natural ecosystems. The planet is losing species 100 to 1,000 times faster than the natural background rates seen in geological record. Ten years ago the Nobel Laureate atmospheric chemist Paul Crutzen even proposed a new epoch Anthropocene, representing a new geological epoch extending over two to three hundred years (compared to other epochs that extended over millions of years) during which "the human mastery over the planet has pushed many species out of their habitats, while others have succumbed to hunting or environmental pollutants." Humans have become a force of nature reshaping the planet on a geological scale - but at a far faster rate in the Anthropocene era - changing the way the world works.

Oil supplies are predicted to be peaking by 2014. By 2050s we will have used up 90 per cent of world's known oil resources. Projections indicate that we will also extract 90 per cent of available coal by 2072. With no viable alternate commercial energy sources on board (nuclear power continues to face opposition) our energy-based civilization is destined to go through hard times or even come to a grinding halt.

Metals also have limits in the same way that oil, coal and clean water do. Researchers say that the finite resources of copper, zinc and several other metals such as indium. gallium, hafnium, silver and platinum that are crucial for technological growth, even if recycled, may not meet the mounting global demand.

All these anthropocentric trends sound the warning bells that planet earth is no longer the old planet that can meet our unending demands and that we must not only solve our social,

political and related predicaments but should also check the reckless plundering of the limited natural resource base. No doubt the problems are such that they challenge conventional wisdom and vested interests and hence difficult to solve. But Nature will not wait for human inertia. Procrastination will only intensify the risk of a "no future" future for the 10,000 year-old civilization. "A planet that could soon be supporting as many as ten billion human beings has to work differently from the one that held one billion people, mostly peasants, 200 years ago". The challenge of the 21st century is to change the way people think about the planet and use their ingenuity to set things right so that the planet continues to foster, and not suffer the fate of the Easter Island (CPS Bulletin, February 2007).

"We are in the middle of a race between human skills as to means and human folly as to ends. Given sufficient folly to ends, every increase in the skill required to achieve them is to bad. The human race has survived hitherto owing to ignorance and incompetence;
but, given the knowledge and competence combined with folly, there can be no certainty of survival. Knowledge is power, but it is power for evil just as much as for good. It follows that, unless men increase in wisdom as much as in. knowledge, increase of knowledge will be increase of sorrow."

- Bertrand Russel

In "The Impact of Science on Society"

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Wars

"The history of humanity is a history of wars."
- Winston Churchill

"The tragedy of war is that it uses man's best to do man's worst." - Henry Fosdick

"The more weapons of violence, the more misery to mankind. The triumph of violence ends in a festival of mourning."
- Lao-tze (604 BC)

"Wars are never paid for in wartime, the bill comes later." -Benjamin Franklin

"The death of one man is tragedy, but the death of millions is statistics."
- Joseph Stalin

War is a primitive human institution. From times immemorial men were engaged in fighting, killing and robbing. The simplest forms of warfare began about two million years ago and lasted till about five thousand years ago. Roving tribes fought skirmishes over food, territory, shelter and women. They used wooden spheres, stone axes, throwing sticks and boomerangs as weapons. These were followed by bows and arrows. Between 5000BC and 200BC, the main principles of warfare developed with the armies using javelins, spears and catapults. The introduction of chariots drawn by domesticated horses gave humans flexibility and mobility never known before. Metals were used for making axes and arrows with sharp edges and also swords and maces. As human settlements turned into cities and cities grew more prosperous, their rulers began expanding and conquering new areas. The period beginning

about 3500BC saw the rise and fall of civilizations such as Mesopotamian, Egyptian, Roman, Chinese and Indo-Aryan, mostly due to wars. Gunpowder discovered by the Chinese and used by Genghis Khan and his hordes during the 12th and 13th centuries to overrun parts of Asia and Europe brought about a total revolution in warfare. Exploiting the technological potential of gunpowder through developing ballistic weapons, the European nations established colonies in Asia, Africa, Australia and the Americas.

In course of time, more and more effective explosive compounds such as nitrocellulose, nitroglycerin, trinitrotoluene, picric acid and RDX, were extensively used for the production of more destructive explosive devices such as bombs, artillery, mines and torpedoes. Airplanes, warships and submarines helped in the extension of battle sectors to the skies, and the high seas.

The concluding part of the 19th century saw the shortage of saltpetre (sodium nitrate), the naturally available nitrogen compound, a major source of chemically bound nitrogen so essential for the manufacture of explosives and fertilizers. A solution to this shortage was found in 1912 by Fritz Haber, the German scientist through the discovery of a method for the synthesis of ammonia from the nitrogen in the air (80 percent). This enabled Germany to produce the firepower needed for launching World War I. This war was followed by World War II, wars in China, Vietnam, Congo and Bangladesh, to name a few, resulting in the death of at least 100 million people making the 20th century the bloodiest century in history.

The concluding stages of World War II saw the unveiling

of the highly destructive nuclear bomb. Two bombs destroyed the cities of Hiroshima and Nagasaki, killing over 200,000 people and injuring about 150,000. Though the war ended with this event, there began a cold war with the super powers US, and USSR building huge nuclear weapon arsenals to a level where they attained the capability to not only destroy each other but the entire world in a matter of days. France, UK, China and recently Israel, India, Pakistan, and North Korea also acquired nuclear capability. According to strategists, this build-up of nuclear arsenals is based on the concept of deterrence, which implies that the nuclear war is so deadly that no country would risk using a nuclear weapon. Stated briefly "Don't do it, or it will kill us both!" With the end of the cold war in the 90s, the members of the so-called nuclear club, US, Russia, UK, France and China initiated the Nuclear Non-Proliferation Treaty (NPT), to take effective measures to end the nuclear arms race at an early date and to achieve nuclear disarmament as part of a process of "general and complete disarmament under strict and effective international control". But these attempts have not so far achieved meaningful results, essentially due to the reluctance on the part of the members of the nuclear club to completely eliminate their nuclear arsenals through a committed time-bound programme. A recent agreement between the US and Russia however has set in motion a programme aimed at the reduction of their nuclear arsenals in a phased manner. Currently the high alert strategic nuclear weapons held by these two powers stand at 1185 mega tons while all other nuclear weapons deployed stand at 2,700 mega tons. China, UK, and France have their own nuclear arsenals. Compare this with the fact that just three megatons of conventional explosives were used in the most destructive World War II! The issue became more complex

with Israel, India and Pakistan and N. Korea acquiring nuclear capability invoking the deterrence concept. With Iran reportedly taking steps to acquire nuclear weapons, the Middle-East has become a nuclear hotspot. The NPT Review Conference, which met in May 2010 did not make much headway towards denuclearization barring a reaffirmation by the nuclear weapon states of their "unequivocal undertaking to accomplish the total elimination of their nuclear arsenals". Excepting endorsement of steps to achieve a Middle-East Nuclear Weapon-Free Zone, there was no commitment on the part of the super powers to completely eliminate their nuclear weapons. The current efforts steps to switch over to nuclear power generation to control the greenhouse gas emissions exacerbates the problems connected with the international control of nuclear fuel (Plutonium and enriched Uranium) and the safe disposal of nuclear fission products. Unless well protected, these can be stolen and used for weapon fabrication by rogue states and terrorist elements. As things stand the world has to be reconciled to the fact that nuclear weapons will be around for a long time to come and that it has to live with the danger of an all-destructive nuclear war. A recent encouraging development is the keenness of the US President Barack Obama to push the CTBT and other related protocols aimed at creating a nuclear-free world. This is a laudable initiative especially in the light of the increasing nuclear threat with the entry of non-state terrorist organizations, which could trigger a nuclear incident with nuclear devices procured through clandestine channels. One such episode was reported by the Georgian government when it blocked eight attempts sell enriched uranium in black market.

Though the risk of a major world war has so far been

avoided through the concept of the so-called nuclear deterrence, the incidence of smaller wars has been on the rise since the 40s, especially in Africa, Asia and the Middle-East, and South America. Most of these wars are local or regional wars or high intensity conflicts between organized groups or armies to take control of a region or a nation or change government policies. Some notable examples are civil wars in China, Congo, Sudan and Colombia, Korean War, Vietnam War, Middle-East wars, Iraq-Iran War, Lebanon-Israel War, Afghanistan War, Pak-Bangladesh War, Sri Lanka War and Indo-Pak Wars. Significantly the supply of arms for these wars come from the industrialized nations led by US, Russia, France, Germany, Czech Republic, Sweden, Israel and the Netherlands. Actually the economies of these countries are dependent on their arms sales. Bulk of these sales relate to small arms such as portable and automatic firearms (e.g. hand guns, pistols, assault rifles, machine guns, etc), light missiles, mortars, grenades, land mines etc. In some cases sales cover battle tanks, fighter planes, warships and submarines. There are around half a billion military small arms around the world. In some countries, especially in Africa, small arms can be purchased at throwaway prices. Some 300,000 to half a million people around the world are killed each year with small arms. They are also the major cause of civilian casualties in civil conflicts. Requiring little technical skill in using these small arms, untrained civilians and even children, have become combatants in some conflicts.

Studies show that countries with rapid urban population growth are twice as likely as other countries to experience civil conflicts. In countries where economic opportunities are scarce, the disenchanted, politicized or unemployed youth are often

among the fast recruits for these conflicts. Such unrests are likely to increase in the countries, especially developing countries, when the percentage of youth in the 15-29 year age group reaches 35 to 55 percent of the adult male population, become more crowded, economically and politically more and more competitive, and culturally more complex.

The 21st century is experiencing the new phenomenon of terrorist wars - wars without national borders. These wars involve numerous players called terrorists, for whom national borders have no significance, save for a place to hide. These terrorist groups, scattered in unknown locations around the world, are networked to an unprecedented extent (e.g. al- Qaida and Laskar-e-Tayyeba) through modern communication systems, technology and transportation, causing damage and disruption- psychological, physical and political- to their adversaries' infrastructure. Their aim is to sow mistrust and stoke fears, weaken the rule of law and shatter the public's confidence in the institutions of the state. Their targets are varied and include commercial centres (New York World Trade Centre, September 2001), public transport (trains in Madrid, Spain, March 2004, Mumbai, July 2007, and London in July 2005), airports (Glasgow Airport, June 2006), passenger aircraft (two aircraft flying out of Moscow Airport, August 2004), places of entertainment (Modern Moscow Theatre, October 2003), places of worship (Akshardham in Gujarat in Sept 2002, and the Mecca Masjid in Hyderabad, May 2007), landmark hotels (the Taj and the Oberoi in Mumbai, November 2008 and the Marriot, Islamabad, September 2008), embassies (Indian Embassy in Kabul, July 2008), sportsmen (Sri Lankan Cricket Team in Lahore, March 2009) and military establishments (Mehran Air

Base in Karachi, May 2011). They appear from nowhere and disappear to nowhere or sometimes even destroy themselves (suicide attacks) making it difficult to take retaliatory action. Eradicating the terrorists will necessitate preemptive action within the borders of the sovereign states, which could sometimes trigger unforeseen consequences. With a rise in the terrorist activities, more and more resources of the democracies, especially those with pluralistic cultures, are being diverted from developmental activities to deal with the law and order problems arising from such extremist activities. Fear has become a ubiquitous phenomenon thanks to newer and more ingenious methods terrorists are resorting to.

The Duke of Wellington, who defeated Napoleon at Waterloo said, "The whole art of war consists of what is on the other side of the hill." In the dreary kind of fight against terrorists and guerillas who operate in hilly tracts, unmanned aerial vehicles (UAVs or drones) operated with satellite technology are increasingly coming to use. These vehicles used by the US in Iraq, Afghanistan and Pakistan are playing a major role in spotting and eliminating terrorist targets in the mountain regions. With infrastructure comprising satellites, Ground Positioning Systems (GPS), and communication channels able to collect vast information each second, these missile and bomb carrying unmanned vehicles relay information to the ground command centre thousands of miles away (e.g. Nevada). After analyzing the information instructions are relayed back to the vehicle to hit the identified targets. These vehicles, constantly scouting tribal areas in Afghanistan and Pakistan, have been eliminating the terrorist squads of al-Qaida and Taliban. In August 2009, two missiles fired from a UAV killed the dreaded

Pakistani terrorist Zubain Baitullah Mahsud, his family members and many bodyguards in his residence. The satellite technology played a very vital role in tracking and killing Osama Bin Laden, the most wanted al-Qaida leader, in his hideout in Abbottabad in Pakistan in May 2011.

The Prime Minister of UK, has recently said that multicultural countries should be less passively tolerant on groups promoting extremism and resort to more active muscular liberalism in the interests of national security. Samuel P. Huntington, a political scientist, in his book on "The Clash of Civilizations" has attributed wars to rivalry among the world civilizations based mainly on religious traditions such as Christianity, Islam, and Hinduism etc. He also said that in the post-Cold War world divided by competition, cultural differences, national interests and political ideologies, conflicts are inevitable. His theory became the subject of extensive debate, but his logic appears to find support from the fact that cultural identities, antagonisms and affiliations are increasingly becoming major causes for conflicts in many parts of the world. Henry Kissinger, former US Secretary of State even warned of a war of civilizations between the West (US and Europe) and a nuclear armed Middle-East.

Prof. Dominique Moise says that in the wake of globalization the world is also getting reshaped on sentiments of fear, humiliation and hope. For example, the Western nations are now dominated by the culture of fear of "the other" and of foreign cultures as they anxiously tried to maintain their global relevance. The Arab and the Muslim world feel a sense of humiliation leading to a hatred of the West. Meanwhile, much

of Asia has been able to concentrate on building a better future, creating a culture of hope. As a result, the Asian economies have been growing while the Western economies have been drawn into a debt trap. Intolerance - irrespective of religion- is on the rise in response to these developments, setting the stage for future economic conflicts. A.J.P. Taylor says, "No matter what political reasons are given for war, the underlying reason is always economic"

All these developments make one wonder whether the dream of a stable, peaceful and conflict-free world can ever be a reality.

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Water for the Billions

"Water is more critical than energy. We have alternate sources of energy. But with water there is no other choice."
- E.Odum

"Thirst could become a weapon more powerful than nuclear, chemical, or biological ones." - J.H. Foegen

"Dirty water cannot be washed." - Anon

"Where will we go to wash our sins if the rivers dry up?"
- A Mahant at Varanasi

Water is the most common and extensively found substance on the Earth, occupying 70 per cent of its surface area. The total global water content is 1.386 billion cu.km. out of which nearly 97 per cent is salt water and not fit for consumption. The balance of just about 3 per cent is fresh water. But 68.5 per cent of this fresh water is locked up in the ice caps, glaciers and permanent ice and hence not available to humans. About 30 per cent of the fresh water occurs as groundwater while about 0.9 per cent is available as surface water in the form of rivers, streams, and lakes. We mostly depend on the fresh water that comes in the form of 70 cu.km. per day of runoff from the rivers, streams and lakes and 70 cu.km. per day flow through the underground reservoirs. This supply has been constant over thousands of years. But the demand has been increasing rapidly especially over the last few decades due to rising domestic use, agricultural and industrial activities. In 1940 when the world population was 2 billion, the annual per capita water use was less than 1,000 cu.m. By 2000 the population rose to 6 billion and the annual per capita water demand also rose to 6,000 cu.m.

putting considerable strain on fresh water resources, especially in heavily populated areas, and places where water is scarce. Agriculture accounts for 70 percent of fresh water use followed by industry (22 per cent) and domestic sector (8 per cent). Clean water is becoming an increasingly scarce resource as the world population continues to explode and the demand for fresh water continues to grow. Already about half of the available freshwater is being used every year. This could rise to 74 per cent by 2050 through population growth and increased demand. If people everywhere used as much water as the average American, one of the most gluttonous water users, the consumption level could be as high as 90 per cent.

The most notable feature of fresh water supply sources is that they are not uniformly distributed over the globe. There are water-rich countries and water-poor counties with annual per capita water availability ranging from 10.767 million cu.m. (Greenland) to a mere 10 cu.m. (Kuwait). In India, the annual per capita water availability was 5,177 cu.m. in 1951. This has dropped to 1,820 cu.m. in 2001 pushing it to the category of water-poor countries. By 2025 the per capita availability is projected to drop further to 1,340 cu.m.

Many of the world's large rivers and their tributaries flow through more than one country. For example, the Ganga and its tributaries flow through Nepal, India and Bangladesh, and the Indus and its tributaries flow through India and Pakistan. The Danube, which rises in Germany flows through Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Moldavia and Ukraine. The Zambezi flows through Zambia, Angola, Namibia, Botswana, Zimbabwe and Mozambique. The Nile, the lifeline of Egypt has its origin in eight other nations of

the basin - Sudan, Ethiopia, Kenya, Rwanda, Burundi, Uganda, Tanzania and Zaire. When a river passes through more than one country, there have always been disputes among the riparian states for sharing the available water. Such disputes date back to 3000 BC in parts of southern and Central Asia, Central Europe and the Middle East. With growing demand for water for agriculture, industry and domestic use, these disputes are reaching serious proportions and sometimes even leading to aggressive postures. India is involved in such disputes with its neighbours for sharing the Indus waters (with Pakistan), the Ganga and Brahmaputra waters (with Bangladesh). Some river waters under dispute elsewhere are the Parana River (Brazil, Paraguay, and Argentina), the Danube (Hungary and Slovakia), the Colorado (US and Mexico), the Zambezi (Zambia and Zimbabwe), Nile (Egypt, Ethiopia and Sudan) Euphrates and Tigris(Turkey, Syria and Iraq), Jordan River (Israel, Lebanon, Jordan and the Palestinian Territories) and the Han (North Korea and South Korea).

Sharing of waters from the rivers flowing within a country at the local and regional levels is also a sensitive issue. Gautama Buddha (563-483 BC) had to intervene in the fight between Shakyas and Kotiyas for the sharing of the Rohini River (Nepal) waters. In the US, sharing the Colorado River water among the states of Colorado, Arizona, California, and Utah is a burning subject. In India, sharing water in several rivers has been a very inflammatory issue, which sometimes leads to violent conflicts. Some notable examples are, the Yamuna (Delhi, Haryana, Rajasthan, HP and UP), the Narmada (Maharashtra, Gujarat, Rajasthan and MP), the Godavari (AP, Maharashtra, Orissa and MP), the Krishna (AP, Maharashtra, Karnataka) and the Cauvery (Karnataka, Tamilnadu and Kerala).

The upstream riparian states of a river have the potential to control the headstream of the river. With rising water needs such countries are increasingly exploiting this advantage. During the Israel-Arab war in 1967 Israel occupied much of the headwaters of the Jordan River, ensuring for itself a more reliable water supply and denying Jordan a significant fraction of the available water. Turkey has taken control of almost all the water in the Euphrates River through constructing many dams as a result of which the flow of water into Syria has been considerably reduced. China is constructing eight dams in the upper reaches of the Mekong River. This could adversely affect millions of people downstream in Myanmar, Thailand, Laos, Cambodia, and Vietnam. China is also reported to be drawing plans to divert the waters of the Brahmaputra River, which originates from the Tibet now under its occupation, into the Yellow River to provide water to China's water scarce regions in the north and northeast under Western Canal project to be completed by 2050. When this diversion occurs, the water flow in the Brahmaputra will fall significantly, affecting India's northeast and Bangladesh. Though China was denying such a plan till recently, it now admits that it was constructing a hydropower project in Zangmu with four more planned. In India, the Maharashtra state is building dams across the Godavari while the Karnataka state is impounding the Krishna waters. These will cause significant reductions in the inflows of these two rivers creating water shortages in Andhra Pradesh.

Construction of dams across rivers for impoundment of water for flood control, irrigation, power generation, industry, domestic use and recreation is a global phenomenon. More than 45,000 large dams, at least 15 metres high, have been constructed across practically all rivers. Together, these large

dams are capable of holding about 15 per cent of the water carried by the rivers each year. All large dams are located in the uphill regions and the populations living in the submerged areas behind the dams are subjected to displacement. According to the World Commission on Dams some 40 to 80 million people have been displaced worldwide. About 1.9 million people were affected by the Three Gorges dam. Based on a survey of 54 projects in India, the people displaced by large dams in the last 50 years are estimated as 33 million. Historically disadvantaged tribal populations and poorer sections of the society that live in the affected regions bear the brunt of displacement. According to the Government of India, less than a quarter of the displaced have been resettled. Even the condition of the resettled people is pathetic, with basic civic amenities and livelihoods severely endangered and standard of living much worse than before displacement.

The life of a reservoir depends on sediment accumulation. Depending on the size and the rate of sediment accumulation it is estimated that most of the world's reservoirs will become non functional in about 250 years. In countries like China and India where the rivers carry large quantities of sediments, this period will be much less. For example, the prestigious 260-metre high Tehri dam reservoir is predicted to be filled up in about 30 years. Once a reservoir is filled up with sediment it is impossible to build a new reservoir for want of suitable alternative locations. Dam bursts or overflows that cause destruction of life and property is another danger to populations downstream. Rivers including the Ganga in Bihar face this problem. A recent example is one of the biggest flood disasters caused by the dam burst on the Kosi River. The silt accumulated behind the dam caused an overflow of the embankment flooding

3.68 lakh hectares of land besides affecting 33 lakh people. Yet another episode is the recent unprecedented flood in Andhra Pradesh and Karnataka that caused extensive loss of life and property. The storage capacity of the Srisailam Dam across the Krishna River near Kurnool built in 1988 has decreased from 308.o63 TMC to 263.6345 due to sediment accumulation. This could be one of the factors that contributed to the damage caused by the floods to Kurnool city and other places in the river basin. The annual damage to crops, houses, and public utilities due to such floods in India, which are mostly manmade, is put at Rs.9.38 billion. Another growing threat of floods is from the steady rise of the levels of the beds of most of the sediment carrying rivers, quite often to the levels higher than the land close to the river banks...

A large number of inland lakes are sources of fresh water for agriculture, fishing and domestic use. Some large fresh water lakes are Lake Victoria, Lake Tanganyika, and Lake Malawi, Lake Chad and Lake Tana in Africa, Lake Baikal and Aral Sea in Russia and the Great Lakes in North America. In India the Dal Lake in Kashmir is a large fresh water lake. From the time of its formation a lake is destined to disappear over a period of time through deposit of detritus and lower feed water streams. Compounding the problem is pollution from agricultural and industrial activities. Africa's lakes are currently subjected to deterioration from all these effects. They currently hold around 30,000 cu.km. of fresh water. But due to human activities they are losing water at an alarming rate and the quality of water they receive is also deteriorating. Lake Baikal in Russia, the world's oldest and largest fresh water lake in terms of volume and home to one fifth of the earth's fresh water, is deteriorating due to pollution from human activities. Aral Sea has fallen in

depth by more than 14 metres and has also shrunk by 70 per cent in the recent decades. The area of the Dal Lake, which was 25 sq. km. in 1953, has shrunk to 15 sq. km in 2007.

Groundwater occurs in permeable geologic formations known as aquifers. There are two types of aquifers - renewable and non-renewable (or fossil). A renewable aquifer is a shallow underground layer of water-bearing permeable rock or unconsolidated materials such as clay, silt, gravel or sand from which water can be usefully extracted using a water well or a pump. A renewable aquifer is sustainable through recharging by rainwater or through artificial recharge. The Great Artesian Basin in Australia is by far the largest aquifer supplying water to Queensland and remote parts of South Australia. Most of the aquifers in India are shallow aquifers and are renewable. Fossil aquifers are non-renewable aquifers representing water accumulated under impermeable strata hundreds or even thousands or millions of years ago. Due to impermeability of the strata, these aquifers are not sustainable as the withdrawal of water eventually leads to its depletion because of negligible recharge, bringing pumping to an end when the water is depleted. An example is the Ogallala Aquifer in the US containing an estimated quantity of 3,400 cu.km. of water now being used to irrigate farms in South Dakota, Nebraska, Wyoming, Kansas, Colorado, Oklahoma, Texas and New Mexico, turning this area into one of the richest agricultural lands in the world. But water from this is being extracted ten to fifty times faster than the rate at which recharge occurs. As a result, the aquifer is projected to dry up irreversibly in 60 to 250 years.

Scores of countries, notably China, India and the US are

over-pumping even their renewable aquifers to meet their growing water needs. As a result the water tables are falling rapidly. The countries (e.g. South Asia. Northern China, Middle-East and SWUS) where the water tables are falling due to over-pumping are home to more than half the world population. In China, groundwater levels are falling as much as one metre per year in the major wheat and corn growing area of Northern China. The World Bank says that India produces 15 per cent of the food using water from groundwater sources. As a result the groundwater levels in 20 states, notably Punjab, Haryana, UP, Maharashtra, Tamilnadu, Rajasthan, Gujarat and AP are falling at alarming rates. A recent study by the National Geophysical Research Institute, Hyderabad, indicates that the region covering over 2,000 km from West Pakistan to Bangladesh extracts 54 trillion litres of water every year. This water which ultimately finds its way to the rivers and the sea, could be contributing to a 5 per rise in the sea levels. Pumping out water from the aquifers in the coastal zones at a fast pace is causing the intrusion of the sea water into these aquifers turning the aquifers saline and making the groundwater unfit for use.

Extensive pollution of river waters and aquifers from domestic and industrial and agricultural wastes is also a matter of grave concern, especially in the rapidly developing economies. The World Bank estimates that 54 per cent of the water in China's seven main rivers is unusable because of pollution. About 70 percent of fresh water sources in India are reported to be contaminated. Water over long stretches of rivers in India is declared unfit for domestic consumption and in some stretches even for bathing. India generates 38,000 million litres (35 metropolitan cities account for 15,644 litres) of sewage every day. Bulk of it goes into the water systems- rivers, ponds

and lakes. Groundwater contamination is a common feature in inland industrial zones. A report by McKinsey & Co says that by 2030, urban India towns could well turn into 'dry stinking holes'.

The growing shortage of pure drinking water is leading to the phenomenal growth of bottled water market globally, more notably in the developing economies. The global market value of bottled drinking water was US$ 60,398.1 million in 2006 for a volume of 115,393.5 million litres. This is projected to rise to US$ 86,421.1 million (41.8% increase) in 2011 with a volume of 174,286.6 million (51% increase) litres. An estimated 200 billion bottles of water are consumed globally. If all these bottles made of plastic were lined up together they would stretch to the Moon and back 56 times!

Lack of access to safe drinking water is faced by an estimated 1 billion population in several parts of the world. Of these about 80 per cent are in China, India, Indonesia and Nigeria. The effects of climate change could add more distress to several regions in the world. The Intergovernmental Panel on Climate Change estimates that 75-250 million more will have to cope with additional limitations of water access due to rising temperatures. By 2050s, the area subject to greater water stress due to climate change will be twice as large as the area currently experiencing decreased water stress. Less rainfall in the coming decades is projected in the already arid areas, including the Mediterranean basin, western US, southern Africa, and northern Brazil, causing a 10 to 30 per cent decrease in surface water runoff. The melting and retreating Himalayan glaciers, known as "The Water Towers of Asia" and construction of dams could adversely affect the river systems that support over 1.4 billion people in China, India, Bangladesh, Myanmar

and other countries. A typical example is the Ganga River, the major lifeline of India. The National Centre for Atmospheric Research in Colorado reports that the water flow in the Ganga in 2004 was 20 per cent less than the quantity 56 years earlier. The study further says the river is likely to shrink faster, and could even disappear in another fifty years causing unprecedented population migrations. A similar trend due to glacier retreats is observed in the case of 45 economically and culturally important rivers the world over. They include the Columbia River (US), Congo River (Central Africa), Mississippi River (US), Niger River (Mali, Niger, Begin and Nigeria), and Parana River (Brazil, Paraguay and Argentina). Global warming and changes in the rainfall pattern are already showing adverse effects on the river water flows and food output.

Many countries, especially in the Middle East, depend upon the technology of desalination (reverse osmosis) of sea water for their fresh water needs. The state of Jordan is currently taking steps to extract more than 10 billion cubic feet of salt water a year from the Red Sea 110 miles to the South, feed into its desalination plant to create fresh water, and send the salty water left over to the Dead Sea by a tunnel. A desalination plant with an output of 100,000 cu.m. per day is slated to come up at Chennai, India.

As a consequence of these developments, the Millennium Development Goal of halving the population without access to drinking water by 2015 could prove elusive.

"We never know the worth of water till the well is dry."

-Thomas Fuller

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Youthquake

"Modernity: We created youth without heroism; age without wisdom and life without grandeur".

- Nassim Nicholas Taleb

The world currently contains the largest generation of young people aged between 10 and 24 years - a phenomenon described as Youthquake. One in every four persons in the world is a youth. Nearly 70% of the youth live in developing countries. The number of youth in the developing countries will continue to rise for another thirty years while both the number and percentage of youth in the industrialized countries is projected to fall. This creates different sets of economic and social challenges in the two regions.

The UN World Youth Report 2005 says that some 209 million young people, or 18% of all youth currently live on less than US$ 1 per day and 130 million on less than US$ 2 per day. Although the current generation of youth is the best educated so far, 113 million children are not in school and 130 million are illiterate. Young people are reaching adolescence earlier and marrying later, with premarital sex appearing to be on the rise. Ten million young people, most of them from Africa and Asia, are currently living with HIV/AIDS, which is the primary cause of mortality among the youth, followed by violence and injuries. This epidemic is also having a devastating effect on the sexual and reproductive health of young people, as they are particularly vulnerable to infections. There has been an unprecedented rise in the use of illicit drugs among the youth worldwide. The demand for drugs among the youth in the developing countries has increased to levels typically found in industrial countries.

Juvenile delinquency continues to be a threat to the society. Over the past decades young people have been increasingly involved in conflicts and militant activities. Political and religious leaders have not taken any meaningful steps to contain the militancy among the youth; in some situation they are even supporting it.

The proliferation of information and communications technology, which has accompanied the process of globalization during the last decade, has presented both opportunities and challenges for the youth. Globalization of media has brought opportunities to broaden the outlook of the youth by providing more equal access to information. but it also "threatens cultural identification and values." Jose Antonio Ocampo, UN Undersecretary-General for Economic and Social Affairs in his foreword to the World Youth Report observes, "While there is still enormous diversity among young people worldwide, the process of urbanization and globalization and rapid advances in information and communications technology have arguably contributed to the emergence of a new global media-driven youth culture."

Many youth, especially in the developing countries, have not been benefited by the opportunities offered by globalization. Education systems do not match the market requirements. Despite the fact that youth are receiving more education, more and more educated youth end up being unemployed or underemployed due to lack of job opportunities. With a total of 88 million, youth unemployment is the highest in Western Asia, North Africa and Sub-Saharan Africa. In rural areas, lack of employment leads the youth to migrate to urban areas. While engaged in doing some service to the urban people the migrant

youth begin to emulate urban lifestyles. Needing the money for these activities they engage in criminal activities. It is projected that by 2030, as many as 60 percent of the urban dwellers will be under 18 years. If timely measures are not taken in terms of providing basic services, employment and housing, the urban youth will end up in the gang cultures of the area.

Of particular concern is the proliferation of street children and homeless orphans in urban settlements in developing countries. They are vulnerable to abduction and trafficking and sexual abuse and diseases. They also face the risk of being involved in or victimized by crime.

India and China, the most populous fast developing countries provide a contrasting picture of youth population. In 2006 the youth population of the 10-24 age group in China was 319 million (24%) as against 331 million (30%) in India. The projected figures for 2025 are 256 million (18%) for China and 349 million (25%) for India. The drop in the youth population of China is the result of its one-child policy. In 2020 the average age of an Indian will be only 29 years, compared to 37 for China and the US, 45 for Western Europe and 48 for Japan.

India has thus the largest youth population in the world. If this rich youth potential is capitalized, India can become an economic power in the coming years. Unfortunately no serious efforts are on cards to channel the youth power by training them in the skills required for gainful employment. Large sections of the youth are also frustrated with poor education, societal, economic disparities, lack of agrarian and industrial reforms, poorly implemented welfare policies and a general lack of job opportunities and the indifferent attitude of bureaucracy and

political leadership. Added to this, religious, fundamentalist and external forces are exploiting the vulnerable youth.

In such a scenario, the Naxal (Maoist) movement, which claims to work for a more egalitarian society, presents an attractive alternative to the youth. Large swathes of territory covering over 40 percent of geographical area in the sub-continent, extending from "PASUPATI (Kathmandu) to TIRUPATI" (AP) with 35% of population, have already come under the control of this grass-root based movement, which is more sensitive to the needs of the poor and oppressed.. Countering it through providing the youth pool with the skills required for playing a meaningful role in the nation-building programmes would be one of the key factors that will determine India's growth paradigm in the coming years.

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