

# SYNERGY

THE EXCELLENCE PLATFORM

Volume - 7, 2012



LEADERSHIP  
*through*  
INNOVATIONS



ऑयल इंडिया लिमिटेड  
(भारत सरकार का उद्यम)

**Oil India Limited**

(A Government of India Enterprise)

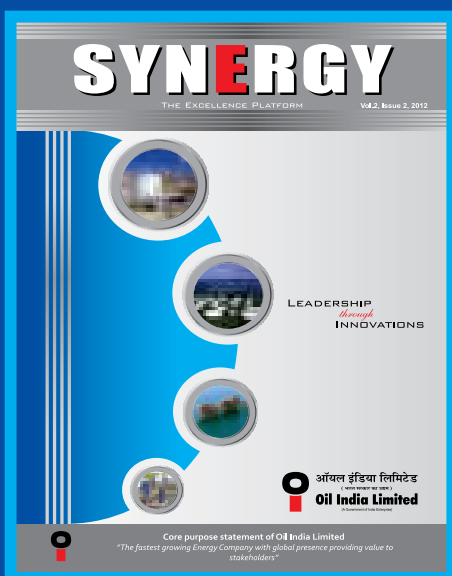


## Core Purpose

"The fastest growing Energy Company with global presence providing value to stakeholders"



# Contents



## EDITORIAL BOARD

Mr. N. M. Borah

Patron

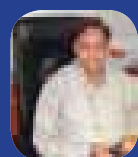
Mr. Arvind Jaini

Editor

Ms. Krishna Hazarika Rao

Sub Editor

*These articles are the personal views of the authors. They do not in any way reflect the views of OIL's Management*



### Overseas Exploration Activities In OIL's Block Shakthi In Gabon (Africa)

02

*V K Kulshrestha*



### Energy Security

06

*Continues to be a worry*

*Dr. Sara Vakhshouri*



### Residential Solar Electricity In Delhi

08

*A Case Study*

*Chudamani Ratnam*

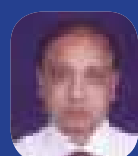


### Quality Of Life: A Study Of Work - Life Factors

14

*A. K. Mukherjee*

*Dr. Shruti Tripathi*



### Undrained Oil Production From A 55 Years Old Field

22

*Another milestone in the Naharkatiya oil field.*

*Sasanka Sekhar Dev*

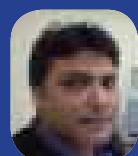


### Importance Of Crude Oil Price

27

*(in relation to Gold Price & US \$)*

*Kishalay Bhattacharjee*



### Navigating The Turbulent "Economic" Weather

33

*The HR way*

*Rituparna Sharma*



### Oil India

38

*A Responsible Corporate Citizen*

*Tridiv Hazarika*



## Editorial



Arvind Jaini  
Editor

*Dear Readers,*

The year 2011 was a year full of events, which affected the energy scenario worldwide. Economic downturns, political uprisings, nuclear disaster at Fukushima etc were some events which took us by surprise and have made us think.

The economic turmoil world wide is a matter of great concern. The markets have been affected; the commodity prices are going up and with the European Union contagion looming large, things don't look very rosy. The price of crude oil hovers over US\$100/bbl and the supply from the MENA region is still below its level of last year.

Libya has not been able to bring back its oil production to even half the pre-war level. Operators have started producing from the fields but it will take time to ramp up the production as there are problems of damage to facilities, shortages, missing equipment etc. In Syria too, the political crisis has hit oil exploration and export

Resources are dwindling but the demand for them is increasing day by day. And what about Iran? Facing sanctions which could reduce or even totally stop its exports of oil, Iran has warned that the price of crude could double to \$250 if sanctions were given serious consideration. On December 27th, 2011, Iran threatened to close the Strait of Hormuz, stirring up the hornet's nest. The energy markets responded in a panic and crude oil prices shot up.

A new McKinsey report says that a complete rethink of resource management will be needed to keep pace with demand, as up to three billion new consumers join the world's middle classes over the next 20 years. Meeting the resource supply and productivity challenges will be far from easy. Of this, energy supply and productivity will be the most challenging. We will have to look into all possible energy resources and step up R&D efforts to exploit alternate sources of energy.

We are indeed thankful to the authors for their contribution in this issue. We hope you like the articles and look forward to your comments.

Happy reading!



## Overseas Exploration Activities In OIL's Block Shakthi In Gabon (Africa)



**VK Kulshrestha**, General Manager (Gabon Project), has experience of more than 37 years as professional geophysicist. So far he has published 20 technical papers and has gathered a rich experience while serving in OIL, ONGC & DGC.

The energy security is on the agenda of all countries worldwide due to oil dependency and it has been a major concern for India, as India imports a large chunk of oil from other countries. It is a known fact that nearly half of proven world oil reserves are found in Saudi Arabia, Iran and Iraq. Africa has been in focus for having untapped oil reserves and therefore it is strategically important for oil companies to look for finding more and more oil reserves in Africa for their energy security. Realizing the importance, Oil India Limited (OIL), a Government of India Company, under the Ministry of Petroleum and Natural Gas has since been looking for business opportunities overseas. OIL has joined hands with Indian Oil Corporation (IOC) to invest and look for finding oil reserves overseas and one such opportunity was available in Gabon (Africa). So, OIL and IOC together made efforts to expand its business in Africa to start with Libya and Gabon. The consortium of OIL and IOC has a lot of synergy as OIL has vast experience in exploration, production and transportation of crude oil whereas IOC has huge experience in refining and marketing of the product.

### **Gabon:**

#### **Geographical Location:**

Gabon is located on the west coast of equatorial Africa having a land area of over 266,000 SQKMS. Three primary towns are Libreville, Port Gentil and Franceville. Libreville, the capital of Gabon, is located in north Gabon near the mouth of the river Como estuary. Port Gentil is the major oil service industry town and is located on Mandji Island adjacent to the Ogooue River Delta of central Gabon. Franceville is the operational center of the mining industry and is located in south eastern Gabon close to the Congo border; it is also on the Ogooue river. Most of the area is covered by equatorial rain forest, but area of savannah & mangrove swamp develops depending on drainage conditions. The principal river of Gabon is the Ogooue located in central



Gabon. Gabon has a hot, humid climate with more rainy months than dry months.

### **Population:**

Gabon has a relatively small population with a current official estimate of over 1.5 million. This small population size, coupled with the natural resource wealth, has given Gabon one of the highest per capita incomes in Africa. Libreville, the capital began as a settlement of slave ship by French in the 18th century, thus deriving the name Libreville. The earliest inhabitant of the area was pygmy peoples. The Gabonese are mostly Bantu, whose movement to this African coast was in response to the arrival of European traders in the area. Gabon's international borders are artificial colonial boundaries; consequently the Gabonese tribes have strong cross border ethnic links especially with Cameroon and Equatorial Guinea. Gabon has over 40 Bantu tribes and languages. Once upon a time, Gabon was a French colony. Consequently, French became a unifying tongue and is treated as the official language.

### **Independence:**

Gabon became an independent country in 1960. Since independence from France in 1960, the political system and constitution has evolved in to present day presidential form of Government in Gabon, generally regarded as a liberal authoritarian regime. The system is not without its critics, but the country's path since independence has been smooth. Gabon is a one party state whose third President since independence Ali Bongo, was elected to office in 2009, after the death of his father & the second President Albert El Hadj Omar Bongo, (1967-2009), who was in power for more than 42 years after the death of first President Leon M'Ba in 1967. This relatively peaceful and stable transition is probably due to three factors. Firstly, the maintenance by France of strong political and economic influences in Gabon since independence, Secondly, the population is small and per capita income is relatively high primarily

due to the successful Oil Industry. Thirdly, tribal conflict is very limited may be due to the cordial relations with its neighboring countries, small population as well as need for trained personnel. Gabon is a moderate non-aligned country and like many of its black African neighbors has apparently had to use expediency in some of its business dealings.

### **BACKGROUND OF OIL BUSINESS IN GABON:**

Gabon's oil adventure began in the 1930s. Since the discovery of the onshore Ozouri Field in 1956, billions of barrels of oil have been produced in this Oil rich country. In 1956 the deposits and Pointe Clairette Ozouri gave their first barrels of black gold. The deposit Gamba, put into operation in 1963, enhanced Gabon's place among Oil producing countries. With the deposit of Grondin Gabonese, it was confirmed ten years later that the Gabonese national production is more than 10 million tons. This deposit has changed the destiny of the country. Earlier, the bulk of income used to come from forestry. Rabi Kunga boosted oil production level from 18 to 20 million tonnes per year in the late 80's.

In the mid-1970, Gabon created, with the oil companies exploiting its black gold, a provision for Diversified Investment (PID) for reinvesting the cash flows generated by the oil development projects. Thus were born, among other things, Agripog (subsistence farming), Agrogabon (industry of palm oil and soap), etc.

However, in 1998, a decrease of 5% per annum production began before recovering in 2008. With 220 000 to 240 000 barrels of oil per day, oil production gives the state 60% of its revenue and contributes to 40% of GDP.

As per UPEGA (Union of Petroleum of Gabon), currently, Gabon has eighteen oil companies which are working there. Anadarko GabonCo, Canadian Natural Resources International, Gulf of Guinea Petroleum Corporation Inc., Forest Oil Gryphon BV Gabon, Mitsubishi Petroleum



Development Company Gabon; Ophir Gabon Ltd, Sino Gabon Oil & Gas Ltd., Sinopec Overseas Oil & Gas Ltd., Sterling Oil & Gas NL, Tullow Oil Gabon SA and OIL INDIA LIMITED. Seven companies are on production as of now and these are : Addax Petroleum, Marathon Oil Gabon Ltd, Maurel & Prom, Perenco SA, Shell Gabon, Total Gabon and Gabon Vaalco Inv.

Shell Gabon and Total Gabon have 60% of production. These two companies have renewed for 20 years and 25 years, their conventional business in Gabon.

### **Ambitions for the oil sector:**

Very successful and strategic resource of oil plays a major role in economy of Gabon. Hopes are now turning to the deep offshore operations. Diversification of International Partnerships (South Africa, Brazil, Canada, China and now India) also maintains the hope of discovering a good size oil field.

### **The prospect of a new golden age of oil:**

To implement its ambitious Project "Confidence in the Future", and ensure equitable distribution of wealth, the President of the Republic Ali Bongo and his government are committed to ensure greater efficiency and better management of sector revenues.

### **Opportunities in the oil and gas sector:**

Promotion of exploration and exploitation of oil, establishment of a regulatory framework attractive to investors and a greater control of sector activities and revenue collection are the order of the day. Apart from oil, natural gas now accounts for more than 20% of overall energy consumption as against 40% for crude oil. This is the third source of energy in the world after oil and coal. Its high energy efficiency, environmental benefits, ranks it among the "clean" energy source.

Natural gas is playing an increasingly important role in the Gabon Energy. Proven reserves in

Gabon were 32.59 billion cubic meters in 2008. The latest figures are yet to be published. The ambitions of the gas sector is to build a network of new gas pipelines, a challenge for Gabon industry. The country is indeed launching a new form of resource development, by encouraging local processing of natural gas.

The use of natural gas in national energy policy is a real ambition. The Gabonese government wants to give itself the means to involve the gas sector in the diversification of the economy in a sustainable manner. The gas industry will thus boost socio-economic development and participate in raising the living standards in Gabon. Gabon has the ambition to develop the production and domestic use and export of this sustainable energy source.

Therefore the Gabonese government eased the tax burden on gas sector to attract investors. All contracts related to oil and gas sector is based on the Mining Code, a tax rate of 10 to 20%. Since January 2010, gas flaring is prohibited in Gabon. By this measure, the Gabonese government intends to promote new techniques of recovery and reinjection, greener and more profitable, to meet international commitments on sustainable development. A deadline was nevertheless granted until 2011 or 2012, to allow time for companies to adapt to this new measure.

### **Presence of Oil India Limited (OIL) in Gabon:**

Oil India Limited (OIL), a Government of India enterprise under the Ministry of Petroleum & Natural Gas has established its Project office at Libreville being the capital of Gabon in the African Continent. The block FT was awarded to the consortium of OIL-IOC-Marvis for exploration of hydrocarbons which was renamed SHAKTHI having acreage of 3761.25 Sq.Kms. Initially, M/s Marvis Private Limited, having registered office in Singapore, had 100% Participating Interest (PI) for Shakthi licence. Later, IOC and OIL entered into a tripartite agreement with M/s Marvis PTE





Limited, after obtaining necessary approvals from Government of Gabon and concerned authority of OIL and IOC.

#### **The Participating Interests (PI) in the Block are:**

OIL INDIA LIMITED: – 45% (Operator)

INDIAN OIL CORPORATION LIMITED: – 45%

MARVIS PTE LTD: – 10%

The above Farm-in agreement was approved by the DGH-Gabon on 28th April 2006 and a CEDP (Contract for Exploration and Division of Production) which is known as PSC (Production Sharing Contract) was also signed along with Joint Operating Agreement for exploration and production in Block Shakthi.

#### **Exploration Programme :**

Aeromagnetic Survey : 36412 Kms (completed)

2D Seismic API : 1039 GLKM (completed)

Based on 2D Seismic interpretation, leads and prospects have been identified

3D Seismic survey commenced in Oct, 2011, over identified prospects based on 2D seismic interpretation results and completed on 24th

Jan. 2011 in two blocks within Shakthi covering 140 SQKMS.

#### **Total Expenditure Till March 2011:**

The actual expenditure incurred is USD 47,659,474 (Forty Seven Million Six Hundred Fifty Nine Thousand Four Hundred Seventy Four USD) till March 2011.

#### **Future Programme:**

As per Production Sharing Contract (CEDP), Exploration drilling of two (2 committed and 1 optional) wells have been planned during 2011-12

CEDP is valid up to 23.11.2012 and drilling of wells has to be completed before the expiry of the phase of exploration.

#### **Experience of working in Gabon;**

The experience of working in Gabon is very rewarding for OIL and its personnel. It has given a lot of exposure to work in different working environment. Understanding the prevailing laws in the country are very essential to operate, understanding the procedures to obtain approvals from Government are also equally essential. The major requirement is to learn the French language without which at times it becomes difficult to be a part of the people of Gabon.



## Energy Security

Continues to be a worry



**Dr. Sara Vakhshouri** is a former advisor to the director of National Iranian Oil Company International (NIOCI) and currently is an independent energy consultant based in Washington DC.

Since the beginning of 2011, we have witnessed various uprisings and change in the Middle East and North Africa (MENA). These regions possess immense crude oil resources. The democracy-seeking movements in Tunisia quickly spread to Egypt, which saw Hosni Mubarak's three decades of rule collapse. Echoes of these uprisings have been felt in other MENA countries, namely Bahrain, Libya and, to a smaller degree, in Iran. Coincidentally (or perhaps not), Mubarak's fall occurred on the same day the Shah of Iran fell over 30 years ago. And in both instances, the simple departure of a sovereign led to a spike in crude oil prices.

The political unrest in Libya that finally led to a change of the government also resulted in oil production cut in this country and highly affected the global energy market to an extent that the IEA members had to release their strategic reserves in order to control the prices.

The obvious geopolitical unrest, combined with the region's huge energy resources, underscore the importance of these countries' role in the global security of energy supplies. In the end, their supplies contribute disproportionately to global energy security. If we look at the historical events that led to political instability in the MENA region and its implications on the global energy supply, we realize how crucial this region is for global energy security. Thus, 2012 looks to greatly shape global energy markets and secure supplies.

The recent energy outlook released by Exxon Mobil demonstrates that oil, gas and coal will continue to be the most widely used fuel about 80 percent of total energy use by 2040. Oil and gas will demand 60 percent of the global demand by that time. Persian Gulf resources have a key role in supplying the mentioned amount of oil and gas.

The Fukushima Daiichi nuclear power plants



disaster in Japan in March 2011, for our purposes here, greatly changed the dynamics of energy demand. After that incident nuclear energy had higher consequences and risks and this resulted to an increase of demand for natural gas as a substitute of nuclear energy for generating electricity in power plants. Demand for natural gas is expected to rise by more than 60 percent through 2040. Therefore stability and security are the main requirements to guarantee supplies from the MENA region.

Although the decision of OPEC members to increase their production (to cover the production

cuts in Libya) and to maintain OPEC's production of 30 million barrels per day in December 2011 were both pieces of good news for oil market, there are still many unsolved, significant issues that loom for 2012. The political turmoil in Syria, continued pressure from the international community on Iranian nuclear ambitions, unrest in Egypt, Libya, and the future of Iraq without a US military presence all present real worries and concerns for energy markets.

[This article was published in the Jan-Feb 2012 issue of Oil & Gas Review and is printed with the permission of the Author]



## Residential Solar Electricity In Delhi

A case study



**Chudamani Ratnam** after completing his studies in London, joined the erstwhile Assam Oil Co., which after nationalisation became Oil India Limited. During his career he served in various parts of India, both onshore and offshore, as well as internationally in Pakistan, Bangladesh, Myanmar and U.K. He has written and lectured extensively on energy related matters.

Having spent all my working life in producing fossil energy, viz. crude oil and natural gas, I have after 20 years of my retirement moved from what started as a mental exercise in renewable energy to a practical venture in producing Solar Photo Voltaic (PV) electricity at my residence in Delhi. Of the different forms of energy I consume, viz. petrol, LPG and electricity, it is the last which forms a major part of my household budget. Of this 80% is used by air-conditioning, and of this again one unit represents 50% of my annual electricity bill. It was this one application which I targeted in considering a solar PV package and eventually installed on my terrace.

Perceived wisdom has it that PV is not economic for air-conditioning but this logic has a flaw in that most PV techno-economic analyses are based on annual averages. The energy from the sun referred to as "solar insolation" as we all know is a highly variable commodity. It starts from zero at sunrise, rises to a peak at noon and falls to zero again at sunset. Furthermore the sun is at its highest and hence delivers most energy on 21<sup>st</sup> June and least on December 21<sup>st</sup>. Typically most solar PV systems are optimized to be effective throughout the year by appropriate orientation, but this comes at a cost. It is important to know that PV panels react to incident light and not to ambient heat

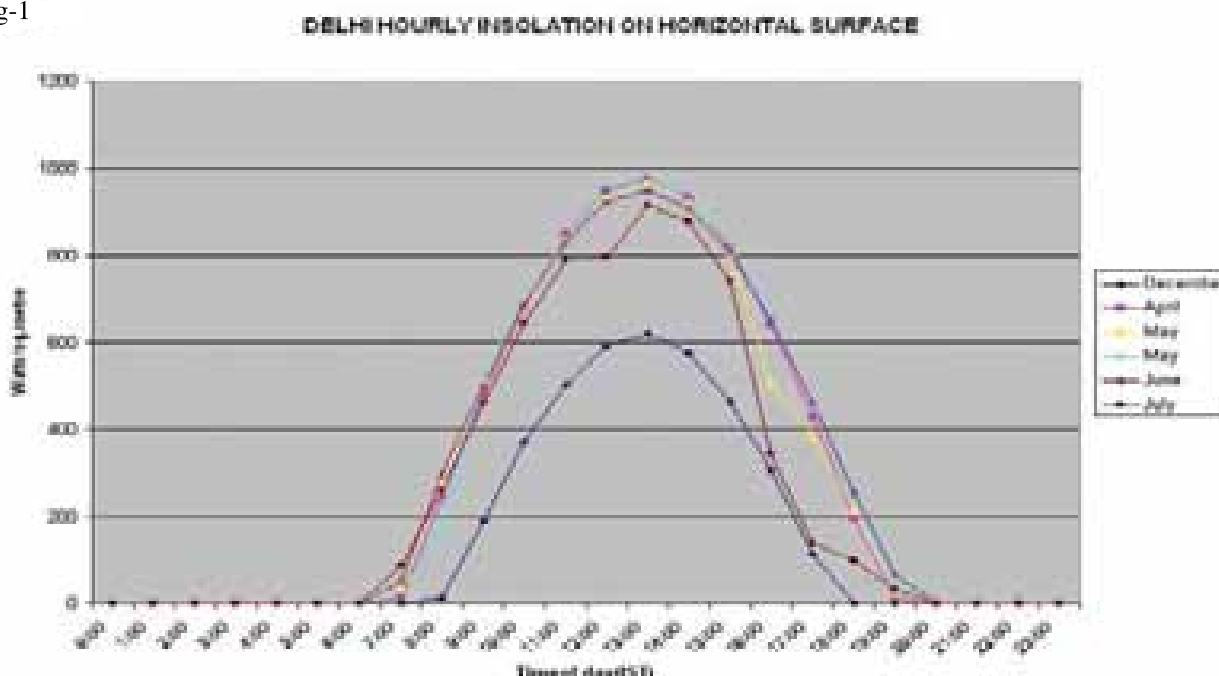
Air-conditioning is a rare application where the demand coincides with peak insolation and the PV system can be optimized to produce maximum electricity when needed most i.e April to June in Delhi. PV output decreases on cloudy days but then so does the demand on air-conditioning which considerably reduces the required system specifications and while still not competitive with the grid, solar electricity is cost effective when compared with a generator. The benefits would be particularly dramatic in areas where daytime load shedding of many hours is common during summer months and as a wise man once said "no electricity is as expensive as no electricity."

For a layman it is useful to know some basics of electricity. Watts=Volts x Amperes. Watt hours=Watts x Hours. Kilowatt (kw)= 1000watts and one unit of electricity is 1 kwh. A PV panel, when exposed to sunlight, outputs DC (direct current) which has to be converted to AC (alternating current of 230V at a frequency of 50 cycles per second) to run various domestic appliances.

Modern appliances are certified as “energy efficient” by the Bureau of Energy Efficiency (BEE)

in the form of hourly readings for major cities in India and elsewhere. On a horizontal shade free surface and for planning purposes it is possible to estimate fairly accurately the total insolation per day as well as variation during the day. Fig1 is a representative hourly plot in watts/sq. metre for randomly selected cloud free days in different months/years in Delhi and the area under each curve is the total insolation for that day. Table 1 lists the total insolation in watt hours for these days.

Fig-1



of the Government which issues star ratings for various energy consuming items. A modern 2 ton air-conditioner consumes 2KW(kilowatts) as against 3KW for older grey market products. and I found it worthwhile to replace my old units. The reduced electricity consumption has made it cost effective to install a PV system and also replace my old 10KW inverter with a 5KW model with a concurrent saving of ₹ 6000/- per annum in maintenance contract.

Historic data of solar insolation is available on the Internet for all days for a number of years

Table 1

Date of Observation	Daily Horizontal Insolation in Watt Hours/ sq.metre	Equivalent Sun Hours	Output of 3KWP Horizontal Panel In Watt Hours
19/12/2006	3749	3.749	11247
18/04/2007	7224	7.224	21672
6/05/2002	7113	7.113	21339
28/05/2002	7358	7.358	22074
18/06/2002	7392	7.392	22176
10/07/2005	6179	6.179	18537



The radiation from the sun has two components, direct and diffuse. One is the direct light from the sun even if partially shaded by cloud and the other is the light scattered from nearby clouds, buildings, dust and water vapour in the atmosphere, etc. which can be a significant proportion. The sum of the two is referred to as global radiation and is what the solar panel reacts to. Even on cloudy days as long as it is not very dark the solar panel will produce some electricity. The plot in Fig.1 is of global radiation as impinging on a horizontal surface but by appropriately orienting the panel to the sun the production of electricity can be increased.

In PV terminology a “peak sun” is defined as having a peak insolation i.e. at mid-day of 1000watts/square metre. Now from Table 1 above for example, on 18/06/2002 the total insolation for the day was 7392watt.hours/sq. metre. This is the amount of energy impinging on 1 sq. metre under a peak sun shining for 7.392 hours and hence the insolation on this date in Delhi can also be defined as 7.392 equivalent sun hours, which is useful for assessing the performance of a PV panel.

The sun moves from an elevation of 23°30' North of the equator on June 21<sup>st</sup>, when the days are longest to 23°30' South of the Equator on December, 21<sup>st</sup> when the days are shortest. Delhi has a latitude of 28° 40' North i.e about 5 degrees north of the highest point of the sun and hence to keep the array pointing at the sun during the hottest months it should be tilted by about 10° sloping southwards. The high point of the sun in Delhi is about 12h20m IST (Indian Standard Time) because Delhi has a longitude of 77° 2' East whereas IST is set to 82° 30' East, roughly at Allahabad and 360° of longitude corresponds to 24 hours.

From April to June the air-conditioner under study runs for 11hours per day, from 11am to 10 pm and hence consumes 22KWH per day. The demand reduces during other months and is

zero from mid-October to mid-March. It can be seen from the table that this load can be met by a 3KWP solar array, Though there will be some systems losses which could reduce performance by about 15%.

The heart of the PV system consists of a set of PV panels forming an array. In my system each panel size is 2'x5' and is rated at “0.125 watts peak.” This rating means that under a peak sun described above the panel will generate 0.125 watts of DC. I have a total of 24 panels generating in all, 3000 watts under peak conditions, amounting to  $3000 \times 7.392 = 22176$  watt hours for the day of 18/06/2002. To distribute this amount over 11 hours of air-conditioner use, the electricity has to be stored in batteries and drawn at a uniform rate of 2KW. At present the orientation of my PV array is fixed but there are more advanced/expensive systems where the array is motor driven to face the sun continuously.

The brain of the PV system is commonly referred to as the inverter, but it actually performs two functions. Firstly it is a charge controller which conditions the DC output of the solar panels and feeds it into the batteries for charging and at the same time ensures that the batteries are not overcharged. The inverter takes the output from the batteries which is DC and converts it to 230V AC for supplying the load and also ensures that the batteries are not over discharged. The capacity of my solar inverter is 5KW to allow for start and stop fluctuations of the load. The inverter which is on the terrace has a display of various operating parameters such as charging and output current, battery voltage etc but I have installed a duplicate display of battery voltage at a convenient location within my residence so as to be able to monitor the functioning of the PV system more frequently.

A top class inverter will produce a true sine wave output unlike cheaper models and all the sophisticated functions of the charger/inverter

are performed by integrated circuits (chips) which are imported. In a common household inverter charging only takes place when the mains power is on and output only when the power is off whereas in a solar inverter both charging and discharging take place simultaneously. Most solar inverters automatically switch over to mains when solar power is not available, e.g. at night but when the sun is playing hide and seek among the clouds the load, i.e. the air-conditioner will kick on and off frequently which is very annoying. I have therefore disabled this function and installed a manual change-over switch

In the long run, batteries are the most expensive, the most troublesome and perhaps the least understood. At least by me, item in the PV system, I use a bank of ten 12V(nominal) batteries in series giving a total voltage of 127. These are sealed maintenance free (smf) inverter batteries and the capacity of each battery is 135AH(Ampere Hour) which is equivalent to 17145 watt hours i.e.  $127V \times 135 \text{ amperes}$  for ten batteries in series. The AH figure will vary depending on the rate of discharge and is typically quoted at 20 hour discharge. The inverter is usually set to cut out at 50% discharge which corresponds to about 8.5 KWH. Because higher discharge will shorten battery life. A good battery should last 1000 charge/discharge cycles and assuming 300 cycles per year this corresponds to about three years, but luck is an important factor. Even if one battery fails the recommendation is to replace all at a cost of around ₹ 8500/- each. Different brands of batteries have variations in their performance which also decline with use and it is not considered advisable to mix brands, models or age.

Battery voltage is an approximate but convenient indicator of the state of charge (SOC) of the battery bank and the display will be around 112V when nearing

full (50%) discharge under load to around 140V at near full charge with no load. On disconnecting or connecting the load these numbers jump to 116V and 127V respectively. This is because there is a variable internal resistance in the batteries which the controller has to overcome. The upper limit of charging current is set to around 1/8th of the AH rating of the battery which works out to  $135/8=17 \text{ AMPS}$ . Battery management is crucial and the various operating parameters should not be compromised, but this is easier said than done as we are at the mercy of the inverter and battery suppliers know how. Batteries can be prematurely and permanently damaged, partially or wholly, by improper handling. Unfortunately the voltage figures given above will still be shown even when the batteries, either the whole bank or individual batteries are partially damaged.

My own experience is that the air-conditioner runs for nearly 4 hours after sunset on fully charged batteries, i.e. the batteries supplies about 8KWH before being cut out by the inverter, which is about 50% of the rated capacity, as expected. However the performance is inconsistent and there seems to be a mismatch between insolation, inverter and battery. To illustrate the problem, around 7th October, 2011, during a totally cloud free week,







when I switched on the AC at 1PM with battery showing 140V it ran for about 3 hours whereas if I switched on at 11AM, 130V, it ran for nearly 6 hours. A disconcerting explanation is that the battery bank has lost a big part of its capacity in less than 7 months. In retrospect I should have installed 200AH batteries but there can be situations in which it is more cost effective to add additional solar panels rather than batteries, mainly because a PV panel's life is more than 20 years. To optimize performance the load should ideally not remain unconnected beyond 140V because then on sunlight would only be wasted.

There are some performance efficiency issues to be considered. Firstly batteries do not give out as much as put in and a loss of about 10% occurs, getting worse with age. Next the inverter also loses about 5% in converting battery DC output to 230V AC. Unfortunately manufacturers do not publish these data and I can't help feeling that they may not even know, except in a cursory way and losses could be worse, especially at the lower end of the market. PV panels are however supposed to perform according to their ratings, less some temperature effects. Panel temperatures in the summer in warm climates can easily reach 50°C resulting in a 12% reduction in output compared to the rated output at 25°C. The BEE should take solar items under their purview as this will also put pressure on the manufacturers/suppliers to learn more about what they are selling.

Indian suppliers/manufacturers of PV systems range from big industrial houses to roadside mechanics. However one thing is clear; they are not advisers or designers and basically can only respond to a tender invitation where the customer lays down detailed, item wise, performance



specifications. They have limited knowledge of insolation, battery characteristics, weather, etc. and I have had to do my own homework. I have used a mid-level supplier because he could offer a price within my budget. The rough break up of my systems cost is;

- 3KW solar array - ₹ 3lakhs.
- 5KW inverter - ₹ 1.2 lakhs.
- Batteries - ₹ 85000.
- Installation including frames etc. - ₹ 75000.
- Miscellaneous electrical works - ₹ 15000.

My residence is a top floor flat and is unliveably hot for a major part of the year. I look upon the PV system as a protection of my investment in the flat

It would be useful to know every morning how sunny the day is likely to be especially during the monsoon period and hence how the PV system is going to perform. The India Meteorological Dept (IMD) puts out on its website ([http://www.imd.gov.in/section/satmet/dynamic/insatnwdist\\_ir.htm](http://www.imd.gov.in/section/satmet/dynamic/insatnwdist_ir.htm))



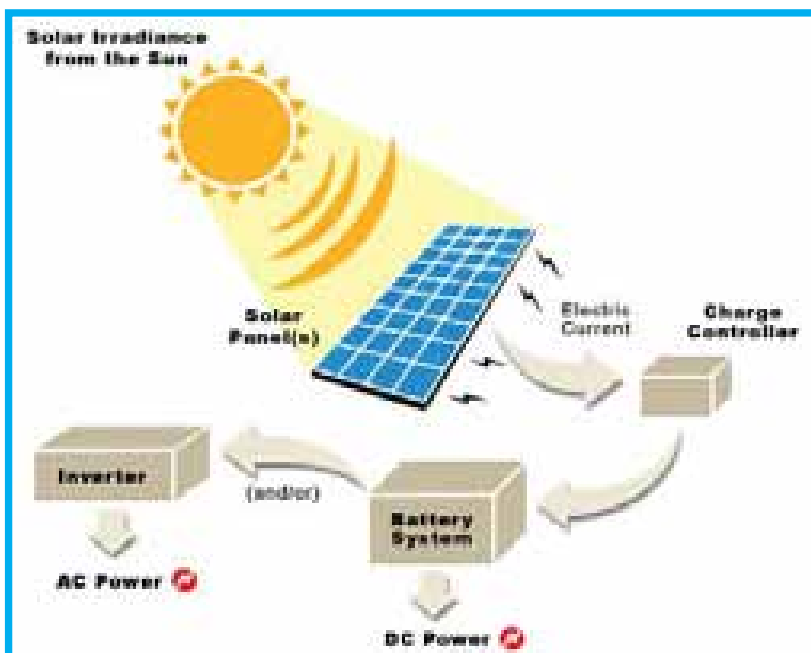
satellite) images of the cloud cover which are updated every hour or so, If the time of the image is given for example as 4.30Z this means 10.00 am IST. (Z is short for GMT also known as UTC). The images to be viewed are visible, infra-red and water vapour from which I have learnt through experience to get a very rough but unreliable idea of the expected insolation. Hopefully IMD will get around to forecasting the expected solar insolation every morning with periodic updates during the day together with the actual for the previous day as it does for temperature and rainfall data.

The above write up focuses on what has been actually implemented and does not do justice to nearly 5 years of mental effort I have put in to study solar energy in all its aspects. This covered electricity, electro-chemistry, light, heat, meteorology and even some astronomy. Among the interesting possibilities was DC air-conditioners which like DC traction are more efficient than AC and such air-conditioners were used by the Indian Railways. This would have also avoided using inverters, and lower powered PV panels would have sufficed but unfortunately DC air-conditioners are not commonly available.

There is a proposal in Delhi to have an arrangement, as in some progressive countries, for the grid to buy back any surplus electricity produced on a real time basis, but this will not work during load shedding which usually coincides with peak solar generation. If successfully implemented it would save on battery costs. Further more, the base electricity load in Delhi is around 3500 megawatts(MW) rising to nearly 5000MW in summer, obviously due to air-conditioning. The built up area in Delhi is around 70000 hectares and about 30% of this is probably available for roof top

PV packages, which would result in a generation of 150000MW (220V A/C). The target population for PV would be the spoilt middle class for whom a Zen or Santro is a second car and would not hesitate to splurge to assure their comfort without any subsidy. However as the sales of solar packages picks up the cost will come down for all. Meanwhile the electricity price in Delhi has recently gone up to ₹ 6 per KWH(kilowatt hour), at the highest slab and we may shortly see time of the day billing.

In concluding one should be aware that the solar industry , especially in India , has not been in existence long enough to assess extended performance or give the practitioners adequate experience. After overcoming various glitches including some personal health problems, I have yet to complete one full annual cycle and I am still rising on the learning curve. It has not helped that this year,2011, has had the rainiest and cloudiest weather in May and June during the last 10 years. Lastly the above guidelines should not be used for mission critical applications such as medical equipment, without additional safeguards.





## Quality Of Life: A Study Of Work -Life Factors



**Dr. Shruti Tripathi**, Assistant Professor,  
HR, AMITY UNIVERSITY, Noida.

**Professor A. K. Mukherjee**, Motilal  
Nehru Institute of Research and Business  
Administration, University of Allahabad.  
[A Central University]

“One cannot do right in one area of life whilst he is occupied in doing wrong in another. Life is one invisible whole” – Mahatma Gandhi.

### Abstract

Today, the repercussions of economic and technological globalization have changed the focus of policy debates towards Human development, as these globalization processes are accelerating changes in geo-political alignments; social and industrial re-structuring ; in our life styles, life-supporting eco-systems and our day to day functioning, locally and globally. The theory of human development is dependent on the contention that economic growth and improved productivity can be achieved only through development of human resources and creation of a conducive environment where people can make use of their capabilities optimally. Our present ailments are those arising from the skewed distribution of resources rather than their availability. In such a position it is imperative for the policy makers to reschedule the fixed and safe approaches of survival and thereby improve upon the Quality of life. The researchers are doing research on ‘Quality of life – A Study of Working Class’, which will make a humble effort to suggest improvements in quality of Life of the working class. The affect of improvement will be multi dimensional viz. the society, the organization and the worker. The present paper is the first conceptual paper in the series which focuses on reflection of different ideas about quality of life. The paper also discusses about the relationship of life satisfaction on the job performance.

### Introduction

Think if God makes us immortal and the richest person on this earth, what will we do for eternity? What difference will it make to us? What makes a place where people want to live and find a satisfying life? How a society can progress despite different individual interests of its members? How can we maintain the dignity of a person while giving



adequate recognition to the preferences of all the other members of the society? Does being rich solve all the problems? Today, being rich doesn't mean a good peaceful life but instead means a stressful job giving the finances but keeping the earner away from the family and thereby making the life more vulnerable. Such questions help us to put into perspective just what is satisfying about life and what we should rather abandon. If we analyze these questions we can understand what factors contribute towards quality of life and the complexities involved in achieving all-round development of the society.

Today, the repercussions of economic and technological globalization have changed the focus of policy debates towards Human Development, as these globalization processes are accelerating changes in geo-political alignments; social and industrial re-structuring and thus our life styles, life-supporting eco-systems and our day to day functioning, locally and globally. The theory of human development is dependent on the contention that economic growth and improved productivity can be achieved through development of human resources and creation of a conducive environment where people can make use of their capabilities optimally. Our present ailments are those arising from the skewed distribution of resources rather than their availability. In such a position it is imperative for the policymakers to reschedule the fixed and safe approaches of survival and thereby improve upon the quality of life.

The notion of Quality of Life has received great attention these days but quest of it is not new and a debate is going on about how an individual and society together can enhance their Quality of Life. The race is not about the survival of the fittest, the theory of Darwin –which doesn't differentiate between virus, bacteria or a human being; instead the concept of quality of life is multi dimensional which is unique to each organism, person, the environment and the social system.

The Quality of Life is not simply an appraisal of social reality but it is a perspective on life. For this, we need to understand, what quality of life is and what it denotes. It has varying manifestations for different groups and classes.

S. McCall<sup>1</sup> has identified quality of life with happiness. His approach to quality of life is the extent to which people's 'happiness requirements' are met - i.e. those requirements which are a necessary (although not sufficient) condition of anyone's happiness - those 'without which no member of the human race can be happy'.

The Utilitarians have posited the basic value or goal that society should strive for is "the greatest happiness for the greatest number". However, how to create such happiness remains one of the eternal philosophical questions.

### Indicators of Quality Of Life

The expression "quality of life" at the first glance gives rise to a reaction in the minds of the intelligent and the lay alike, and its appealing and tasteful. Thus beneath the vast expanse of appealing and tasteful are hidden the rare elements of gentility and grace. Thus appealing and tasteful are the most visible signs of civilization whereas gentility and grace are its ideational foundations. Thus gentility and grace determine the nature of bonds between the members of the family, between the family unit and the relatives and finally between the individual, his family and rest of the society in its various shades. These qualities of human existence and human personality itself develop on two mutually interlinked planes-the subjective and the objective one.

The objective indicators are like: health, poverty, unemployment rates, gender ratio, crime rate etc. which 'represent social facts independent of personal assessments' in contrast to subjective indicators which emphasize on the individual perception and evaluation of social conditions.



The table 1.1 shows the frequently used objective and subjective indicators:

**Table 1.1**

**Objective Social Indicators:**

Life expectancy	Crime rate
Unemployment rate	GDP
Poverty rate	School attendance
Working hours /week	Prenatal mortality rate

**Suicide rate**

**Subjective Social Indicators:**

Sense of community	Material possessions
Sense of safety	Happiness
Relationship with family	Satisfaction with life as a whole
Job satisfaction	Sex life
Class identification	Hobbies and club membership

**Perception of distributional justice**

*Source: Items drawn from Cummins (1996b); Hagerty et al. (2001) and Noll (2000).*

The subjective is derived from the values we hold dear to our heart and mind and the objective is satisfaction of worldly wants like hunger, sleep, protection from adversaries, ailment and alike. From the personal problems of “roti, kapda aur makan”, much confined to our personal sphere we also remain directly concerned with the problems of pollution free atmosphere. The quality life demands from the various organizations, local self governments and even the state and central authorities to come forward with vigorous plans of thought and action together in the matter.

The subjective consists of our sense of values, our way of thinking and our existence in all its form-political, social and economic. Here we are

pursuing a problem in the Indian context, the first question that arises here is how Indians with their sense of values rooted in their respective cultures, sub-cultures look to this issue of quality of life. Still closely attached to the material aspect of life and living there is another important area of human existence that is hunger and thirst of the soul which is quenched by spiritual domain of life.

**Relating Life and Work Life Factors-**

**Fig. 1**



**Figure 1: Spheres of well-being**

*Source: Felce, D. & Perry, J. (1997) Quality of life : the scope of the term and its breadth of measurement in Roy I*

According to the UNDP<sup>2</sup>, human development may be defined as “a process of enlarging people’s choices.” At all levels of development, the three essential choices for people are, to live a long and healthy life, to acquire better knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not met, many other opportunities to improve the quality of life will not be fulfilled. If we closely see all these things primarily get affected by the finances in hand. The work we do and the rewards we get. The functionings of a person refer to the valuable things that the person can do or be (such as being well nourished, living long and taking part in community life). Without adequate income, many health and education services may not be accessible; and without a good education rewarding jobs and income opportunities may



not be available to an individual. Therefore all these components of human development are interrelated to each other.

Difference between economic development and human development is that the former focuses on the extension of one option (income or product), while the latter broadens all the human options for which economic development is one of them.

The importance of work is reflected in an extensive literature that concentrates on “quality of working life”, a rapidly growing literature on the ability of people to “balance” work and family life and analyses of the impact of work deprivation or unemployment on mental health and wellbeing. It seems clear that happiness in one’s working life does “spill over” into one’s non-work life. Tait, Padgett and Baldwin’s<sup>3</sup> (1989) review of studies of job and life satisfaction across 34 countries finds an average correlation coefficient of 0.44 between measures of the two. However, there remains much contention about the direction of causality and the role of other factors.

In another significant research, as part of an Australian QOL panel survey (using the same group of respondents over a series of four survey administrations), Headey et al.<sup>4</sup> (1991) tested a model which evaluated the causal direction between six domain satisfactions (marriage, work, leisure, standard of living, friendship and health) and subjective well-being. Results from the analysis revealed that work, leisure, and standard of living domains illustrated top down causation (i.e., subjective well-being/life satisfaction had an effect on work, leisure, and standard of living). Thus, the study of Headey et al. (1991) gives some credence to the top-down effect of life satisfaction on domain satisfaction as opposed to the generally held bottom-up effect.

### Work and Non-Work

The directional relationship of work and non-work has been inconclusive (Loscocco & Roschelle<sup>5</sup>,

1991). According to Near et al.<sup>6</sup> (1980) two assumptions have predominantly characterized the work non-work relationship:

1. *Compensatory Hypothesis* - human disappointments in one area of life (e.g., work) are made up (compensated) by another sphere in life (e.g., non-work) and
2. *Spillover Hypothesis* - attitudes or behaviors from one domain generalize to another (e.g., work attitude carries over to home). Little empirical data, however, have verified those two hypotheses.

Studying the vast domain that the work and non-work construct, Near et al. (1980) reviewed the literature that deals with (1) how workplace structures (e.g., pay, physical conditions, nature of the job, etc.) affect attitudes toward life and behaviors in extra-work (i.e., non-work) roles and (2) the degree to which structures associated with life outside the workplace (e.g., demographic variables like age, family size/type, community variables etc.) affect work attitudes and behaviors. In reviewing the effects of work structure on extra-work reactions, Near et al. (1980) noted a clear relationship between workplace structures and individual attitudes and behaviors outside the workplace, although the causal nature of the relationship is not clear.

### Quality Of Life and Performance

The research work done in this area is mostly unidirectional. There is an influence of bottom-up approach where the effects of work on QOL related factors (e.g., family responsibilities) have been focused upon rather than the converse direction. Especially lacking has been research identifying the effects of QOL factors on job performance. There has been a lack of research detailing the QOL-performance relationship.

When examining family-related variables, Schultz and Henderson<sup>7</sup> (1985), pointed out that the non-





work influence on performance has been deficient because of the overriding assumption of many researchers that work affects family, rather than the reverse relationship and there is an on-going difficulty of measuring job performance.

### **Income Satisfaction**

Income is a key determiner of individual, family and community wellbeing and is the single most important modifiable determinant related to health and quality of life in general. Income levels indicate the ability of citizens to meet their needs and directly correlate with their conditions of health, education, social interaction, housing, leisure and general life style. Income satisfaction is yet another feature where public sector seemed to be at advantage. The income satisfaction is not a financial aspect only instead it has non-financial facet too. It comes from the holistic view of job which includes quality as well as quantity of job.

### **Turnover and Life Satisfaction**

In a multivariate analysis of the determinants of job turnover, Arnold and Feldman (1982), found that age, tenure in the organization, overall job satisfaction, organizational commitment, perceived job security, and intention to search for an alternative position were the most projecting variables—each of which was negatively related to turnover, with the exception of intention to search for an alternative position which was positively associated with turnover. It was also noted that turnover was more strongly related to intentions to search for alternatives than intentions to change job positions. In a subsequent review of the literature, Mobley, Griffeth, Hand, and Meglino<sup>9</sup> (1979), also found support for the negative relationship of age, tenure, overall job satisfaction, and reaction to job content with turnover.

Muchinsky and Tuttle<sup>10</sup> (1979), reviewed four personal factors that may influence turnover: (1) age, (2) tenure, (3) family size, and (4) family

responsibility. They found that age and length of employment were consistently and negatively related to turnover. Family responsibility has also been consistently and positively associated with turnover. They also observed that family size/turnover association appears to be positive for the primary wage earners but negative for the secondary wage earners.

Porter and Steers<sup>11</sup> (1973) also pointed out that family size and responsibilities were positively related to turnover among women, while the impact on men was mixed. In a study of attrition of female managers by Rosin and Korabik<sup>12</sup> (1990), the results for the turnover/gender relationship have been mixed, sex has been more predictive in managerial than non-managerial populations, implying a particularly high rate of attrition among women MBAs. It was also pointed out that financial burdens associated with marriage may reduce the attrition rate for males whereas the heavier domestic burdens associated with marriage may increase the turnover rate for females.

### **Conclusion**

Paid employment serves an important social function also. It gives a sense of purpose, self-worth and status, as well as providing a basis for interaction with other people. Employment contributes to people's sense of belonging and to feeling part of a community and society. It is a key factor especially for marginalized members of society, in improving their situation.

The organizations which provide genuine and meaningful participation in the decision-making process, recognition and appreciation of individual talents, inclusivity, gender sensitivity, effective dispute-resolution mechanisms and relief from excessive work pressure can ensure a better management of talent in this era of global competition.

Thus, the concept of human development, in line





with its focus on enabling people to enjoy a better life as the ultimate goal of human endeavor, highlights that this goal cannot be achieved solely through improvements in income or material well-being and while their parameters by people may change over time and differ between countries and even groups within the same country, the basic components of human development - income, education and health are nevertheless considered essential at all levels of development because these basic capabilities becomes basis for more advance capabilities.

For a better quality of life a balance of one's commitment is required to being the best one at work and an equal commitment to being a great family person and a loving friend. Understand that without a balance in every core area of your life, one will never find lasting happiness and a sense that one has lived well.

The broad scope of the prerequisites for human development as outlined above raises an important issue as to their applicability to individual countries. Their policy implications are certain to vary from one country to another as what constitutes appropriate some of the human development policy is likely to be unique to each individual country and will be influenced by its religious, cultural, social, political and economic values.

The work atmosphere also affects the people, the kind of holidays they spend, the amount and very important the quality of work and rest they take, it all compounds to the quality of life of the working class. Similarly the quality of life employees lead has an important and lasting impact on what they do in the organization. It would not be out of context to mention that every employer should first ensure, and if not, provide immense opportunity to the employees to improve Quality of Life of the persons who are deeply and directly associated with the routine activities of the organisation. Employees are the first customers of the services and opportunities of the organization they serve. Let them enjoy and actualize the jobs assigned

to them otherwise how can they make other stakeholders reach to the ultimate goal of the organization-ACTUALISATION.

## References-

- [1] McCall, S.: 1975, 'Quality of Life', Social Indicators Research 2, pp 229-248. <http://www.gdrc.org/uem/qol-define.html>
- [2] Human Development Reports (1990) – UNDP
- [3] Tait, M., Badget, M. Y. and Baldwin, T. T. (1989), "Job and life satisfaction: a reevaluation of the strength of the relationship and gender effects as a function of the date of the study", Journal of Applied Psychology, 74,502-507.
- [4] Headey, B., Veenhoven, R., & Wearing, A. (1991). Top-down versus bottom-up theories of subjective well-being. Social Indicators Research, 24, 81-100.
- [5] Loscocco, K. A, & Roschelle, A. R. (1991). Influences on the quality of work and nonwork life:Two decades in review. Journal of Vocational Behavior, 39, 182-225.
- [6] Near, J. P., Rice, R. W., & Hunt, R. G. (1980). The relationship between work and non-work domains: A review of empirical research. Academy of Management Review, 5(3), 415-429.
- [7] Schultz, J. B., & Henderson, C. (1985). Family satisfaction and job performance: Implications for career development. Journal of Career Development, 72(1), 33-47.
- [8] Arnold, H. I, & Feldman, D. C. (1982). A multivariate analysis of determinants of job turnover. Journal of Applied Psychology, 67(3), 350-360.
- [9] Mobley, W. H., Griffeth, R. W., Hand, H. H., & Meglino, B. M. (1979). Review and conceptual analysis of the employee turnover process. Psychological Bulletin, 86(3), 493-522.
- [10] Muchinsky, P. M., & Tuttle, M. L. (1979). Employee turnover: An empirical and methodological assessment. Journal of Vocational Behavior, 14, 43-77.
- [11] Porter, L. W, & Steers, R. M. (1973). Organizational work, and personal factors in employee turnover and absenteeism. Psychological Bulletin, 80(2), 151-176.
- [12] Rosin, H. M., & Korabik, K. (1990). Marital and family correlates of women managers' attrition from organizations. Journal of Vocational Behavior, 37, 104-120.

# The seed that never grew - **Honesty**

A successful business man was growing old and knew it was time to choose a successor to take over the business.

Instead of choosing one of his Directors or his children, he decided to do something different. He called all the young executives in his company together.

He said, "It is time for me to step down and choose the next CEO. I have decided to choose one of you." The young executives were shocked, but the boss continued. "I am going to give each one of you a seed today - one very special seed. I want you to plant the seed, water it, and come back here one year from today with what you have grown from the seed I have given you. I will then judge the plants that you bring, and the one I choose will be the next CEO."

One man, named Jim, was there that day and he, like the others, received a seed. He went home and excitedly, told his wife the story. She helped him get a pot, soil and compost and he planted the seed. Everyday, he would water it and watch to see if it had grown. After about three weeks, some of the other executives began to talk about their seeds and the plants that were beginning to grow.

Jim kept checking his seed, but nothing ever grew. Three weeks, four weeks, five weeks went

by, still nothing. By now, others were talking about their plants, but Jim didn't have a plant and he felt like a failure.

Six months went by, still nothing in Jim's pot. He just knew he had killed his seed. Everyone else had trees and tall plants, but he had nothing. Jim didn't say anything to his colleagues, however, he just kept watering and fertilizing the soil. He wanted the seed to grow.

A year finally went by and all the young executives of the company brought their plants to the CEO for inspection. Jim told his wife that he wasn't going to take an empty pot. But she asked him to be honest about what happened. Jim felt sick to his stomach, it was going to be the most embarrassing moment of his life, but he knew his wife was right.

He took his empty pot to the board room. When Jim arrived, he was amazed at the variety of plants grown by the other executives. They were beautiful, in all shapes and sizes.

Jim put his empty pot on the floor and many of his colleagues laughed, a few felt sorry for him!

When the CEO arrived, he surveyed the room and greeted his young executives.

**Whatever You Give To Life, Life Gives You Back.**



Jim just tried to hide in the back. "My, what great plants, trees, and flowers you have grown," said the CEO. "Today one of you will be appointed the next CEO!"

All of a sudden, the CEO spotted Jim at the back of the room with his empty pot. He ordered the Financial Director to bring him to the front. Jim was terrified. He thought, "The CEO knows I'm a failure! Maybe he will have me fired!"

When Jim got to the front, the CEO asked him what had happened to his seed - Jim told him the story.

The CEO asked everyone to sit down except Jim. He looked at Jim, and then announced to the young executives, "Behold your next Chief Executive Officer! His name is Jim!"

Jim couldn't believe it. Jim couldn't even grow his seed. "How could he be the new CEO?" the others said.

Then the CEO said, "One year ago today, I gave everyone in this room a seed. I told you to take the seed, plant it, water it, and bring it back to me today. But I gave you all boiled seeds; they were dead - it was not possible for them to grow.

All of you, except Jim, have brought me trees and plants and flowers. When you found that the seed would not grow, you substituted another seed for the one I gave you. Jim was the only one with the courage and honesty to bring me a pot with my seed in it. Therefore, he is the one who will be the new Chief Executive Officer!"

If you plant honesty, you will reap trust; if you plant goodness, you will reap friends; if you plant humility, you will reap greatness; if you plant perseverance, you will reap contentment; if you plant consideration, you will reap perspective; if you plant hard work, you will reap success; if you plant forgiveness, you will reap reconciliation; if you plant faith in God, you will reap a harvest. So, be careful what you plant now; it will determine what you will reap later.



## Undrained Oil Production From A 55 Years Old Field -

Another milestone in the Nahorkatiya oil field.



**Sasanka Sekhar Dev**, Joined Oil India Limited, Duliajan in the year 1991 as an Executive trainee in Geology and Reservoir Department. Last twenty years have been working in different sections/capacities in fields and project as Geoscientist. Additionally, working as alternate Operating Committee members of two non-operative NELP Exploration blocks in Assam and West Bengal.

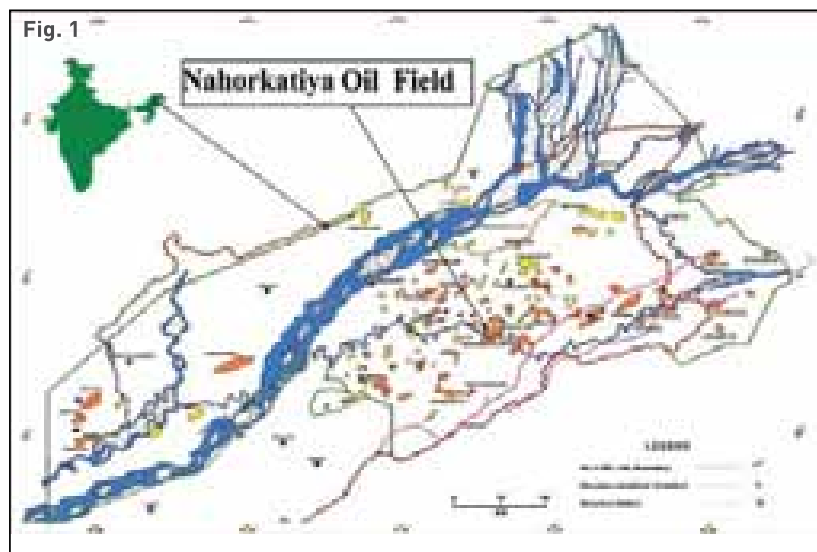
The Nahorkatiya oil field is well known to all Oil Indians cutting across generations, to all the old timers of the Indian petroleum Industry and a large section of petroleum explorationists of the world. This was the first oil field discovered in the independent India. The Nahorkatiya oilfield with its myriad geology has contributed to the Indian petroleum industry and the country more than what anyone could have expected. With new ideas, concepts, technology and initialization, the contribution from this field has been immense and can be compared to the Kamdhenu of Indian Mythology.

Discovered in 1953 this field has had many achievements in terms of longevity, recovery and cost of production etc, during its long life of production history of oil and gas. Different oil field infrastructure/installations associated with this field have become obsolete/unusable but the field is still on production. Even after around 60 years of uninterrupted service to nation in particular, in terms of crude oil production, this field is still a major contributor towards the production of liquid hydrocarbons & feedstock for gas in the latest scenario of industrial development of NE India.

Recently, the Nahorkatiya field has achieved yet another milestone in its glorious history when significant production has been added to the company's total oil production following drilling of two new wells in the field. In this article I would like to highlight few salient points on this particular milestone.

The Nahorkatiya oilfield was discovered in 1953 and is located at a distance of around 30 km towards the west of the historic Digboi oil field, the first oil field in Asia (Figure-1). So far, a total of around 205 wells have been drilled in this field mainly for Oligocene (Barail) hydrocarbon prospects. The field has produced a significant amount of oil (305 MMBBL) out of an in place volume of 950 MMBBL and gas of 29774 MMSCM during the last five and half decades and is still

on production. The field also has a large gas cap and the initial GIIP is estimated to be around 73060.20 MMSCM.



**Figure 1 : Location Map of Nahorkatiya Oil Field**

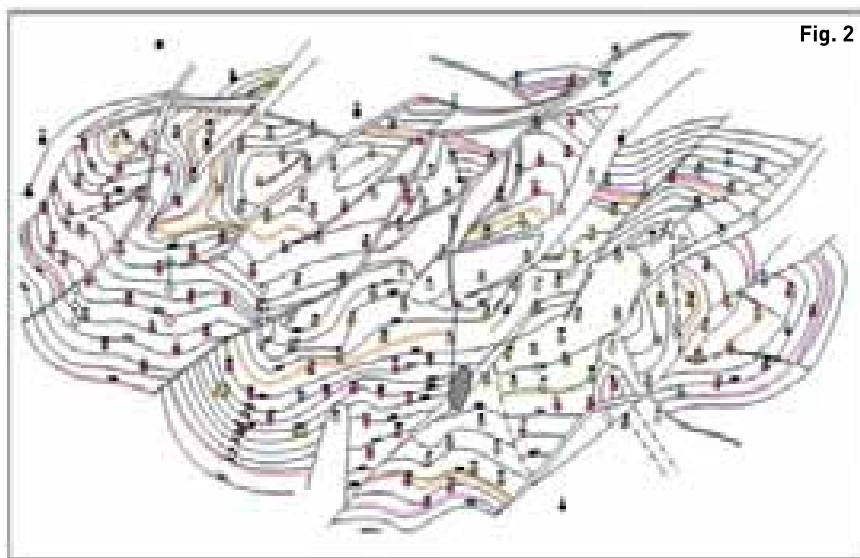
If we consider the contribution in financial terms it amounts to around Rs.1.2 lakh crores at the present international crude oil price. No doubt it is an astronomical figure. Conversion of the recoverable gas reserve at the present market value translates to around a few lakh crores value. It is estimated that with systematic production, gas from this field can be supplied to BCPL/BVFC/NEEPCO for the next 10-15 years. It's really an unbelievable contribution from a single oil /gas field.

The subsurface Nahorkatiya structure, on which the Nahorkatiya oilfield is located, is a faulted anticline with the major axis trending in E-W direction. The field is compartmentalized into different fault blocks by a number of NE-SW trending normal faults

(Figure-2). Initial pressure of the reservoir was around 260 KG/CM<sup>2</sup> but with subsequent withdrawal, the reservoir pressure has declined at places to around 85 KG/CM<sup>2</sup> (175 KG/CM<sup>2</sup> below hydrostatic pressure). To arrest the pressure drop, water injection and gas injection were initiated in the reservoir at different periods since the early eighties.

Till the mid part of the first decade of the new millennium, recovery from this field was in the range 30-50%. Reservoir pressure was on a downhill trend. Of over two hundred wells drilled in the field, only around 30 wells were on production. Production from the field had gone down from the peak around 44030 BBL to 3775 BBL. It was in this

milieu that initiation of a geological review of a discrete fault block within the Nahorkatiya was started in the year 2007 (Figure 3). Based on the in-house review, proposal for drilling of infill and extension locations in the 55 years old field for bypassed/undrained hydrocarbons was put



**Figure 2 : Depth structure map of Nahorkatiya Main Field**





forward in Field Development Note (DGN 960). The reviewer had a nightmare with old vintage logs, scarcity of vital data and poor productivity of old wells/high watercut wells/ high GOR wells. But use of basic petroleum geological concepts and guidance from seniors helped in deciphering the geology and subsequently identifying of the sweet spots for drilling was possible.



**Figure 3 : Depth structure map of study area within Nahorkatiya Main field**

Backing the project to the hilt, Mr. P.N.Baruah, the then General Manager (Geology & Reservoir), whose geological work in analogous fields has been path breaking, took the bold step to forward the review to the releasing authority in spite of huge risk that involved the investment of around Rs. 40 crores for drilling and completion. In addition, for proper drainage of the undrained hydrocarbon Mr.Baruah suggested two more locations to be proposed in the nearby area. But, the reviewing group during the subsequent deliberation was more in favour of a phase wise implementation of the plan due to the risk involved and ultimately it was agreed to keep the latter locations in the future category (Figure-3). It needs to be mentioned here that in the early 1990s, Mr. Baruah had reviewed the area and his observations had been presented in an internal Note (DGN 381) but his concepts was not accepted at that point of time.

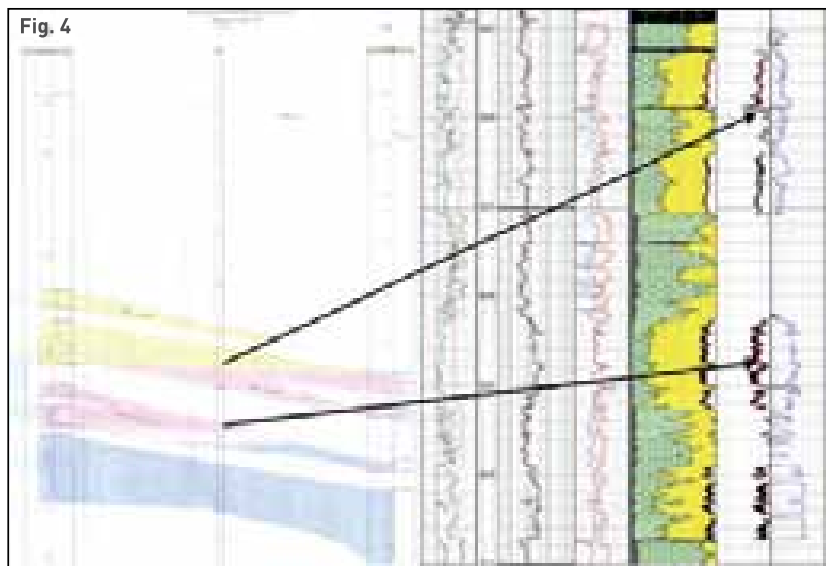
Based on the review, three locations were proposed in category A(Loc. X, Y, Z) and two locations were proposed as future locations (Loc. P, Q) from the G&R Department , Duliajan (Figure 3), and subsequently released after detailed review by Director (E&D)'s office.

The infill location X had been released as Loc NKW and subsequently drilled as NHK 587 .The well was completed at a total depth of 3282 meters in July 2010. Wireline log evidence indicated around 50m (expected 54m) of hydrocarbon pay to be present in this well (Figure 4). Despite the evidence, apprehension still lurked about the flow of oil to the surface considering the low reservoir pressures. The final result astonished every body when the well produced clean oil @350 BBL per day, similar to production from any other new/virgin reservoir with flat GOR and around 1-2% water.

Detailed work and application of basic petroleum geological work had paid off and in a business where uncertainty is invariably an integral part, the flow of oil in well NHK 587 saved us from embracement from our peers.

Subsequently, Loc.Z (released as Loc. NKY) had been taken up for drilling during Aug 2010. This well was considered to be even more critical than the earlier well NHK 587 (Loc. NKW), as it was an extension location placed in structurally the most down dip part of that particular fault block. A number of structurally updip wells were shut in due to water cut or had been converted to injection wells. The well was completed as NHK 589 in Oct/Nov 2010 with total depth of 3297 m. Log evidence indicated around 30 meters of hydrocarbon pay (expected pay 35m) in this well (Figure-5). However worries persisted on the actual production from the well despite positive log interpretation results because of the low pressure in the reservoir and the well being





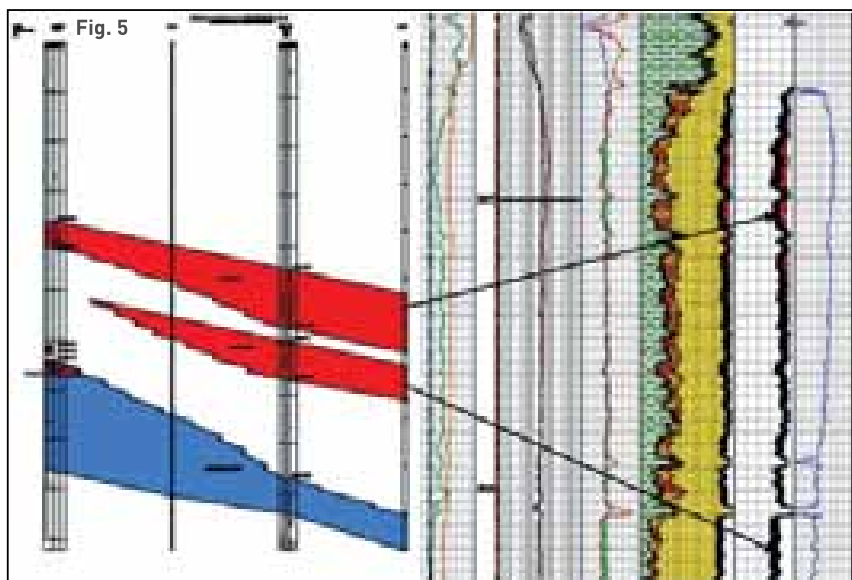
**Figure 4 : Geological cross-section and log interpretation showing expected and actual hydrocarbon pay in NHK 587 (NKW)**

structurally the most down dip well. The final result brought a big smile on everybody's face when the well produced clean oil @ 520 BBL per day rate. The success of the above encouraged us the take risks, and we were ready to accept the responsibility of failure as well. We are ready to accept the responsibility for failure in exploration for greater interest of our company.

Currently the well NHK 587 is producing @ 460 BBL and the cumulative production from this well is 159530 BBL, while the well NHK 589 is producing @ 1040 BBL and cumulative production is 218050 BBL (as on 31.07.2011). Production behavior of these wells can be compared with a new reservoir. For a greenhorn it is hard to believe that 55 years field old can produce like any other virgin reservoir.

If we convert the total crude oil production of last few months from these wells in fiscal terms it comes to a gross of around Rs. 165 crores at current international crude oil prices. It can be seen that less than one year earnings from the production of crude oil from these two wells is probably more than one year's PRP of all Oil Indians or OIL can pay the review team's (4 members) entire service life payment from less than a month's production from these wells. Is this not a commendable contribution from these wells?

Many more such discoveries are possible in our mature fields. Greater challenges and opportunities are lying ahead for the younger generation. The need is to face the challenges with hard work, dedication and translate opportunities to success which would lead our company to even greater heights.



**Figure 5 : Geological cross-section and log interpretation showing expected and actual hydrocarbon pay in NHK 589 (NKY)**



These discoveries have opened up new avenues for the petroleum explorationist to look for more opportunities also in those areas which have had a prolific production history. Success may not be easy but one single success like the one in Nahorkatiya Oilfield, can compensate for numerous failures. In hydrocarbon exploration success and failure go hand in hand but the fear of failure should not deter our mission. History has proved that such a spirit has spurred the petroleum industry to find hydrocarbon below ocean water depths of 3 KM.

Many members of OIL's family may not have been aware of this real life example of finding new oil in an old field right at our home turf and the author's intention is to share the experience through this article. It is yet another cause to celebrate the

success of our beloved company and cheer for this great oilfield which brings us pride over and over again. A word of caution in future beware of prefixing the word 'old' when referring to the Nahorkatiya oilfield, it may boomerang on you.

#### Acknowledgement:

Author like to acknowledged Shri P.N.Baruah Group General Manager (E&D) and Shri R. Borgohain, General Manager (G&R) for their technical input in preparing the paper. Author also is indebted to Shri I.Barua, Chief Geologist (Dev) for his valuable input. Support from Shri Pradyut Bora, Senior Geologist & Shri Kanak Sharma of E&P Development Center are thankfully acknowledged.





# Importance Of Crude Oil Price

(in relation to Gold Price  
& US \$)



**Kishalay Bhattacharjee**, Chief Manager (Materials) (I/C) Oil India Limited. A first class mechanical engineering graduate from the University of Kolkatta, has a long 26 years of creditable professional and managerial experience. During his service carrier, he had exposures in various seminars, industrial programmes, workshops etc. in the premier management schools/ institutions in India

## Introduction

The fate of the traditional financial assets is linked with the vulnerability of the oil price (ceteris paribus). After the Russian crisis & fall of the Asian Tigers, the price of oil touched \$12 per barrel (1998) & hit as high as \$147 per barrel (2008). The range is unbelievable, almost 1125% growth in a short span of ten years!

The mysterious relationship among Oil Prices, Dollar & Gold Prices has always attracted numerous individuals. Many bright minds attempted to solve the puzzle formed by these apparently unrelated variables. The said relationship & its nature are analysed in the subsequent sections.

At the outset, please find below some graphical representation of historical data available from different data sources which reveals the relationship. In the next section, the statistical results are interpreted following standard & fundamental economic theories ["Base"] & geopolitics ["Superstructure"]. Finally, few strategies have been recommended which may help investors to take a call on their investment portfolio.

## A Graphical Analysis

The graphical chart representation also indicates the more commonly used gold price in \$/ounce. The data is derived amongst others from the U.S. Geological Survey Minerals information. The high Gold price in 1980 coincided with allowing short selling of Gold. The US Government decided to let go of the Gold window in 1971. Weakness in the US Dollar tends to be offset by strengthening of gold prices. Gold remains a principal financial asset of almost all central banks alongside foreign currencies and government bonds.



**Figure 1 : Gold Price Chart from 1833-2008**

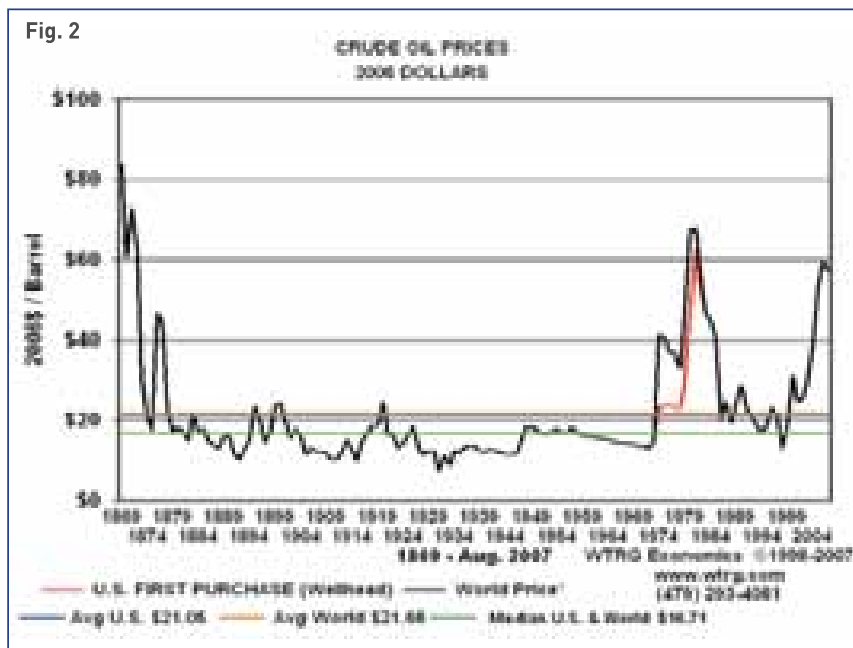
Crude oil prices behave much as any other commodity with wide price swings in times of shortage or oversupply. The crude oil price cycle may extend over several years responding to changes in demand as well as OPEC and non-OPEC supply.

The U.S. petroleum industry's price has been heavily regulated through production or price controls throughout much of the twentieth century. In the post World War II era, U.S. oil prices at the wellhead averaged \$24.98 per barrel adjusted for inflation to 2007 dollars. In the absence of price controls, the U.S. price would have tracked the world price averaging \$27.00. Over the same post war period the median for the domestic and the adjusted world price of crude oil was \$19.04 in 2007 prices. That means that only fifty percent of the time from 1947 to 2007 have oil prices exceeded \$19.04 per barrel. Until the

March 28, 2000 adoption of the \$22-\$28 price band for the OPEC basket of crude, oil prices only exceeded \$24.00 per barrel in response to war or conflict in the Middle East. With limited spare production capacity, OPEC abandoned its price band in 2005 and was powerless to stem a surge in oil prices which was reminiscent of the late 1970s.

The very long term view is much the same. Since 1869, US crude oil prices adjusted for inflation have averaged \$21.05 per barrel in 2006 dollars compared to \$21.66 for world oil prices. Fifty percent of the

time U.S. prices and world prices were below the median oil price of \$16.71 per barrel.



**Figure 2 : Crude Oil Price Chart from 1869-2006**

If long term history is a guide, those in the upstream segment of the crude oil industry should structure their business to be able to operate with a profit, below \$16.71 per barrel



half of the time. The very long term data and the post World War II data suggest a "normal" price far below the current price.

With or without the stabilisation policies, rise in oil prices, generally augments inflation.

Stabilisation policy [as adopted by India] suggests subsidising the Oil prices to prevent rise in oil prices following the global price signals. However, to make up the huge loss of the oil importing trade channels, compensation is provided in the form of long term Government bonds. The oil companies sell those bonds in the market to obtain cash. Thus money supply increases inevitably, resulting in inflation. Without the stabilising policy, market price of oil is adopted. The higher transportation costs eventually pushes up the prices of all the necessary as well as luxury goods.

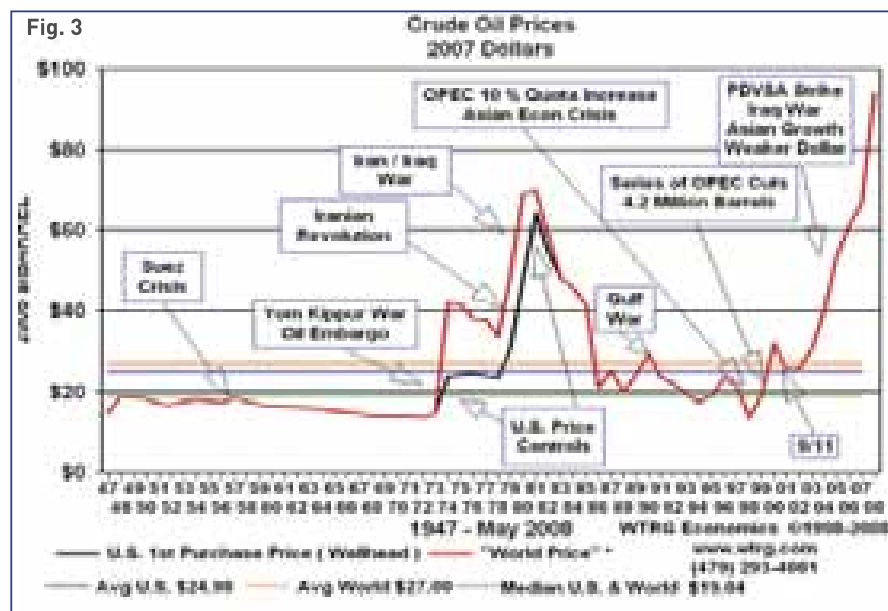


Figure 3 : Crude Oil Price Chart from 1947-2007

The results are dramatically different if only post-1970 data are used. In that case U.S. crude oil prices average \$29.06 per barrel and the more relevant world oil price averages \$32.23 per barrel. The median oil price for that time period is \$26.50 per barrel. If oil prices revert to the mean, this period is likely the most appropriate for today's analyst. It follows the peak in U.S. oil production eliminating the effects of the Texas Railroad Commission and is a period when the Seven Sisters were no longer able to dominate oil production and prices. It is an era of far more influence by OPEC oil producers than they had in the past.

## The Economic Interpretation

### Oil Prices & Inflation

The economies of the oil importing countries always feel pressure due to rise in oil prices.

## Why Dollar & Oil Prices are inversely related?

United States accounts for only 5 percent of the world's population; it consumes 25 percent of the world's fossil fuel-based energy. It imports about 75 percent of its oil, but owns only 2 percent of world reserves. Because of this dependency on both oil and foreign suppliers, any increase in price or supply disruptions will negatively impact the US economy to a greater degree than any other nation. However, one of fundamentals of International finance says that if the relative inflation in the home country is higher compared to foreign country, the exchange rate weakens. This predicts an inverse relationship between dollar & oil prices.

## Why Oil & Gold prices are directly related?

The association between the prices of the king of commodities (Oil) & the king of metals



(Gold) is rather mysterious at the surface. The connection seems a little weak between these “unrelated” variables. To introspect & probe this relationship, let us turn back the pages of the history. Arab producers historically preferred to receive gold in exchange of oil. This dates back to 1933 when King Ibn Saud demanded payment in gold for the original oil concession in Saudi Arabia. In addition, Islamic law forbids the use of a promise of payment, such as the US dollar, as a medium of exchange. There is growing dissention among religious fundamentalists in Saudi Arabia regarding the exchange of oil for US dollars.

Oil, gold and commodities have all been priced in US dollars since 1975 when OPEC officially agreed to sell its oil exclusively for US dollars. From 1944 until 1971, US dollars were convertible into gold by central banks in order to adjust for any trade imbalances between countries. Up to that point, the price of gold was fixed at US\$35 per ounce, and the price of oil was relatively stable at about US\$3.00 per barrel. Once the US ceased gold convertibility in 1971, OPEC producers were forced to convert their excess US dollars by purchasing gold in the marketplace.

The economic intuition from demand side is now clearly visible. Gold has been the ultimate form of money through six millennia of human history, utterly immune to the inevitable debasement and inflation that all paper currencies eventually suffer. This is the reason that increase in oil prices increases demand for gold. As the demand rises, price of gold increases. So, there exist a strong direct relationship between oil & gold.

From the supply side, it is evident that oil is used in the process of excavating and refining the gold. Hence, whenever the oil prices go up, cost of supplying gold goes up. Eventually, gold prices increase following the shift in marginal cost curve.

### Why Dollar & Gold Prices are inversely related?

Current monetary system of the world is called “Flat Currency”. This means that the usefulness of paper currency does not result from any intrinsic value or guarantee that it can be converted into gold or another currency, but from a government's order (fiat) that it must be accepted as a means of payment.

However, unlike Dollar (or any paper currency), Gold stores an intrinsic value. Gold is inflation immune. At present, most of the countries have got Foreign Reserves & these reserves are in the



Figure 4 : Gold Oil Ratio: A study for the period 1965-2004





form of Dollars. For example, India boasts more than 120 Billion Dollars of reserves. If the dollar loses value, the entire basket loses value. So, countries will look for safe haven i.e. Gold. If Dollar loses value, the demand for Gold by the governments of the rest of the world goes up. This increases the gold prices worldwide.

Let us think of a situation where Dollar is no longer the medium of exchange. As the classical economists used to say, "Money acts as a veil... all transactions take place under the veil". In the very long run, 1 ounce of gold can buy is around 15 barrels of oil.

It is a long run equilibrium ratio that was historically maintained. Whenever there was a significant difference, one of the variants moved more than proportionate to maintain that ratio. To explain the statement let us consider the next chart where the movement of Oil Price & Gold

price is considered simultaneously for the period 1965-2000.

The first significant deviation is observed during 1975-77 when the gold prices & oil prices moved in opposite direction. The price of gold was decreased more than proportionate compared to the rise of the price of Oil. The Gold Oil ratio fell to mere 8.1. During 1982-1983 there was a sharp fall in the price of gold again & it was decreased more than proportionate compared to the fall of the price of Oil. As a result, the ratio was 9.0. However, every time the ratio fell (or rose), a strange force pulled it back (or pushed it down) to maintain the equilibrium!

The beauty of this Gold-Oil ratio lies in the underlying facts:

- All markets dislike extremes.
- All valuations revert to its mean

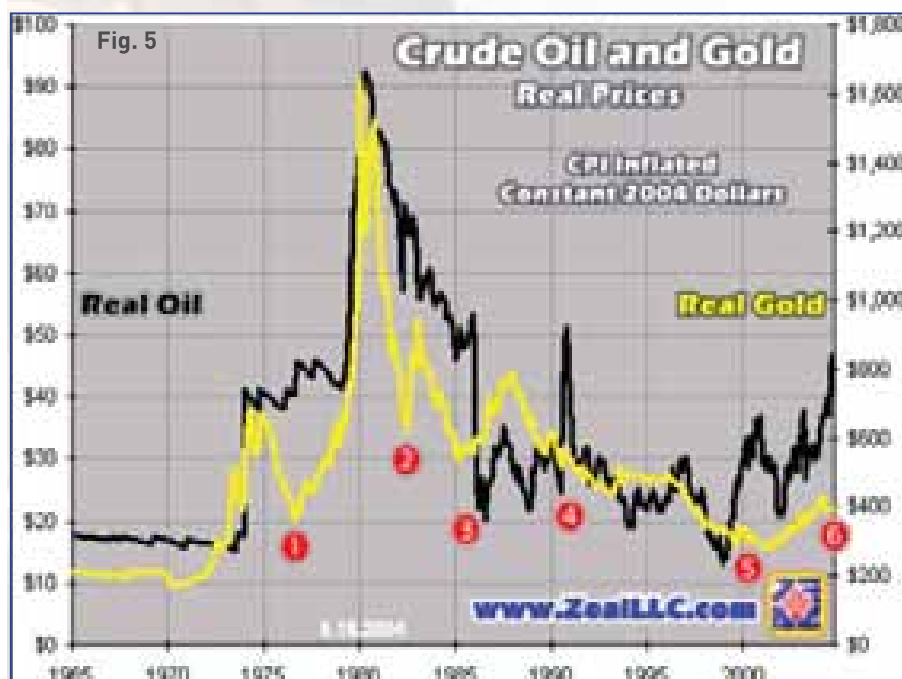


Figure 5 : Gold Oil Price Movement: A study for the period 1965-2004

To better understand the probabilities of where the GOR tends to trade within its long range, standard deviation bands are overlaid on this chart. Statistically the GOR should be within +/-1 standard deviation from its average 68.3% of the time, +/-2 SDs, 95.4% of the time, and +/- 3 SDs, 99.7% of the time.

The ratio between 1 ounce of Gold [\$ 856.30 /ounce] & Crude Oil (\$40.1/barrel) as on 10th of January, 2008 is 21.35. This is just above +1 standard deviation.



## A preview of future

This has a serious implication as far as investment strategies are concerned. Though in the short run, oil is bearish but in the very long run, the strong fundamentals will revive the dormant bull.

It is a historical & economic fact that cartel can't control the price forever. Whenever the price of a commodity goes above the long term average (inflation adjusted) price, it will inevitably fall back. This happens due to the fact that high prices will bring new supplies and thus drive down costs.

However, Oil is a non renewable commodity. According to Dr. Colin Campbell, one of the world's leading geologists, the world consumes four barrels of oil for every one it discovers. We are now depleting global reserves at an annual rate of 6 percent, while demand is growing at an annual rate of 2 percent (and that growth rate is expected to triple over the next 20 years). This means we must increase world reserves by 8 percent per annum simply to maintain the status quo, and we are nowhere near achieving that

goal. This implies higher oil prices in the very long run.

Similarly, Gold is also a non renewable commodity. Earlier we have established that oil prices & gold prices move in tandem. However, while annual gold production is approximately US\$35 billion, annual oil production is US\$1.5 trillion. As oil prices will increase and demand for US dollar diversification increases, there will be an ever-expanding number of petro dollars and other offshore dollar holders chasing a relatively small amount of bullion ounces. Too much currency will chase too few Gold. Price of Gold will certainly increase.

In the present scenario the dollar is going very strong, the dollar shall weaken over time. With an ever-increasing US money supply, growing triple deficits and mounting debt at all levels, the US dollar is likely to continue the decline. It is very unlikely that oil exporters will continue to hold \$ as their reserve currency. At some point, they may decide to abandon the US dollar in favour of Euros, Islamic gold and Silver Dinars.



# Navigating The Turbulent "Economic" Weather -

The HR way



**Rituparna Sharma**, Manager (A), Kolkata Branch, A B.Sc [Geology] graduate and a post Graduate in Personnel Management from Pune University and PG diploma holder in Labour Laws and Labour welfare from symbiosis (Pune). A Certified Petroleum Manager (CPM) from Indian School of Petroleum, Dehradun. He had the opportunity to represent India in 62nd Annual Global Convention of SHRM held at San Diego, USA as part of Indian delegation in 2010.

## Introduction

The recent global economic crisis has wrecked financial havoc on businesses, industry, commerce and trade alike. This downturn in the form of economic tsunami (as collousal and devastating as the one we recently witnessed unleashed by nature) has completely wiped out many businesses out of trace and left others severely battered and bruised. Financially, companies are still reeling under it's blows and are finding it difficult to make way out. Almost all business across the entire spectrum of industry have been affected as the meltdown took pandemic proportions. The consequence was that, most companies found it difficult to rely on time tested methods to fight the difficult times which have otherwise stood them in good stead in boom time.

There was volatility and unpredictability which lead to panic and desperation. The fall out of the economic slump was such that companies started loosing self-belief and the entire focus was shifted to short-term survivalist thinking. Not that this was not the need of the hour, however it mostly happened at the expense of long term competitive viability and success orientation views. Surprisingly though, some organizations not only survived this economic onslaught, they delivered better result in terms of bottom line and thrived in that critical environment. Viz. IBM, Sasken, Schlumberger, Lenevo and our own TISCO to name a few. So how did they do that ? These companies did something that others did not. The winning mantra for these companies was that they explored new opportunities by responding immediately, decisively and strategically during that crisis phase. They brought transformational changes across their value chain and succeeded. Nevertheless, here was a question again, How did they managed the turnaround?

On a closer look, it was revealed that behind the success story of all these organizations lay



the pivotal role played by HR. Now the remark itself could raise a few eyebrows, isn't it? More so, when general hackneyed view regarding HR is that, it is more of a backend staff support service. How could someone possibly envision HR being in the forefront of some remarkable turnaround success story? However, that is exactly what the fact is. Along with other factors, here a responsive and proactive HR with a strong intent has done the trick. As a need of the hour, it aligned itself in line with the business strategies and needs of the organization and managed to provide much needed impetus. Most common criterion to have come out on further closer look is that, these organizations during such tumultuous period found ways and means to optimize cost, increase productivity, enhance operational efficiency and execute balance on key focus areas. Here it is HRM, which enabled the aforesaid by maneuvering itself strategically with the business needs.

### **HR –The New Outlook**

In the words of Mr. Kumaramangalam Birla, the owner and CEO of \$20 billion worldwide conglomerate, ABG group, "HR is never been so visible as it is now, and that HR Head of any organization is never so close to its CEO. The new mandate in business environment is that HR is right where the heart of the business is."

As they say, when the going gets tough, the tough gets going. So when chips are down, especially during downturns, with economic recession all over, there was no better opportunity for a Human Resource setup to showcase its ability. In this kind of scenario, HR needed to take concrete steps in taking up the challenges and compulsions and restore stability in the organization.

During downturn as companies shifted their focus towards creating more value by implementing cost effective means, HR acted as a prime driver and played a pronounced role. In such difficult

circumstances, it was felt that it would be almost suicidal on the part of HRM to continue operating on traditional platform without resorting to innovative means of managing things. The need was to orient itself strategically as per business requirements. However, during recession each focus area for business possessed distinct HR challenges and managing it became more difficult than in boom time. During slowdown, it requires better understanding of external factors and anticipation of events. Here in case of the winning companies, HR came into fore, as it had requisite competency to guide and navigate the organization -like a pilot in bad turbulence.

### **HR Challenges in Face of Adversity**

"Difficulties shape character. How you deal with challenges today helps define who you will be tomorrow". Financial Meltdown was such a phase where HR needed to show and shine at the same time and prove its mettle. With a downturn of such magnitude, the maximum efforts companies zero in are on implementation of cost cutting measures. Unfortunately, the first on the list has always been streamlining human resource. The dilemma in these circumstances for HR was not only to manage this crucial resource in the most cost effective manner but also to look into avenues to eliminate extra luggage off its back. HR managers had to look at how best they could drive utilization, exercise control over discretionary spending and HR budgets, improve employee productivity, tighten the linkage between performance and pay, retain key talent and still maintain right equilibrium in the business hierarchy. With the above challenges to deal, only by following rule of thumb, "unprecedented changes demand unprecedented prudence." HR drove home the point, Creative thinking and Innovative HRM is good in time of business growth, but the recession is not good for innovative HRM initiatives if they are not cost effective and result oriented.





To tackle the aforesaid challenges the focus of the HR was on the followings:

**(a) Re-formulation of HR Policy and Strategy:**

As the demand of all the functions of business to respond proactively grows within the organization to show positive impact on bottom line, HR function included, the need was to develop a HR strategy that reflects cost focussed business strategy, clearly prioritizing high impact HR interventions, which in turn allowed management to focus, control and ensure better utilization of energy and resources.

*Develop a cost focussed HR policy.*

**(b) Organizational Assessment or Audit:** Even though labour cost or cost of people is the largest single element of operating costs of many businesses, it may not always necessarily be prudent to reduce personnel as the first option of cost cutting. On the contrary, assessment of organization or audit may reveal other areas where cost cutting measures be made viz. improvement of processes, reduction in cycle time, capacity utilization, decrease inventory to name a few. Here HRM with its competency played an important role in carrying out such assessment. However, lay-off or retrenchment was still an option when inevitable.

*Revisit your workplace planning structure.*

**(c) Organizational Restructuring:** This initiative bear fruit if implemented effectively. However, it could still act as a double edge sword and spoil the game. It has to be implemented with a focus on driving clear accountability which will ensure better utilization of existing resources which otherwise may have been left neglected or underutilized. Restructuring ensured that the hierarchy was stable within the organisation with clear-cut role

assignment and accountability thereby enabling focussed attention to the key tasks.

*Set Clear cut levels of authority and accountability*

**(d) Information Sharing/Dissemination:** People in organizations do not like surprises—particularly so if they are unpleasant ones. During downturn, confidence could be low as employees frequently get what is called bad communication. In such situations, implementation of confidence building measures in form of correct and timely communication could help immensely. To allay fear and to instill a sense of confidence, HR generated well-planned strategy to dissipate information. Clear, unified, consistent and continuous communication was key to manage employee morale. It was also imperative to let the people know what the company is doing in such difficult phase and why. With anxiety prevailing everywhere, communication to employees regarding company's plans including what could be their employment fate was realistically and honestly spelled out, so that in case the company has to implement tough decisions they are already prepared to handle the storm.

*Walk the talk*

**(e) Performance, Reward and Compensation Structure:**

It is necessary to conserve the value within the organization. Downturn offers new avenues for your talent pool that could be anxious to venture out as competitors could entice them out. In such cases, it is prudent to identify, nurture and maximize potential of your valued assets, which in the long run is likely to provide competitive advantage. A sharp focus mechanism thus, was on performance and rewarding high performers and taking remedial measures against the non-performers. Talent rewarding





and differentiation in pay on account of performance was instituted. Non-monetary recognition mechanism and other innovative means was adopted to reward talent and continuously reinforce their commitment to the business. A survey conducted by Mercer and AIMA in India where more than 80% respondents were CEOs, CFOs and CHROs, it revealed that then single most important strategy adopted by most of these companies during recession is to focus on investing in talent for the long term. Intellectual capital is not added overnight, and efforts to nurture have to be valued as an investment, not just as expenditure. We must ensure that the human capital advantage is sustained, irrespective of good or bad times.

*Harness intellectual capital, empower the deserving employees.*

- (f) Human Resource Development Functions/ Training Initiatives:** Cutting back on training could prove counter-productive for organization that looks to have long term success orientation plans. It may not necessarily mean that these companies are not responsive to short term remedial strategies. What it required was re-designing training programs to suit immediate requirement as well as to serve long term purpose. HR looked into some low cost options viz. strengthening the mentoring programs, develop and introduce more in-house coaching interventions, work shadowing etc. Implementation of multi-skilling techniques, brainstorming sessions with experienced colleagues etc. proved another option.

*Enrich employee's jobs/tasks.*

- (g) Employee Productivity and Efficiency:** The name of the game is creative HR. What is required of HR is to create an environment and culture of innovation in the organization. HR assisted to review how works are being

done to suggest improvement in system, processes and lead times etc. in relation to managing and utilization of human capital in the most effective and efficient way. Ad hoc arrangement were given way to improved processes and practices. Looking positively, downturn was the opportunity to introduce best practices that were neglected in growth times.

*Optimize utilization of Human Resources*

- (h) Cherry Picking/Selective Hiring:** Even though hiring freeze is common mantra during downturn, it is not bad choice for companies to go for selective hiring to fill the gaps and bolster their talent pool. Similar to what traders call "value buying" i.e. buy when it is cheap, in stock market parlance. Winning companies increased campus hiring from best institutes, which otherwise could have proved costly proposition in boom time.

*Create a talent pool*

- (i) Organization Culture:** An organizational culture of mutual trust and faith is to be created where continuous learning is embraced. Efforts to improve human capital should be considered as investment rather than expenditure. The need is to develop a conducive and positive work culture. By constantly communicating and understanding the pulse of the employees in the current environment and fine tuning communication, the HR ultimately drove them to effectiveness. HR approached people issues with respect and dignity and worked out solutions which paid unbelievable dividends.

*Create feel good atmosphere*

### **Spirit of HR in Recession**

The HR Management has to have their priorities set in mind and strategic impact of the HRM innovations in the recession time.



The role of the HR management is not to minimize the costs for the time being, but to look into the bigger picture.

This economic turmoil has indeed taken its toll. Widespread lay-offs, crashing stock markets, bankruptcy of super giant corporates and overall insecurity. However, we have seen emerging economy like India did not wilt under this gigantic pressure. It could be because of multiple reasons. One striking reason could be that historically companies are anchored in India and wedded to traditional values and strong ethics. Overall the global economy is showing signs of ricochet. It would still be early days to believe that business is back on track and "all is well" again. The need of the hour for HR is not to loose its focus from the core purpose. The common thread all through is that one needs not to react but respond to the situation - with an analytical and pro-

active approach. So HR by taking control of the steering today can decide whether to use accelerator or brake when need arises. This would then ensure stability in the organization and also enhance credibility of HR as a valued partner in business operations. "It is not the most strongest of species that survives, or the most intelligent, but the one most responsive to change." It is with this motto that HR needs to redefine its core objective particularly in the time of economic crisis. It can be now safely concluded that HRM with right spirit could indeed play a decisive role in turbulent times as it normally does in robust times in not only preserving and nourishing the human capital assets of the organization but to make the organization stronger and ready for the future growth. In other words, for HR, the downturn, economic crisis offers a great opportunity to make most of the worst

**Difficulties Shape Character.  
How You Deal With Challenges Today  
Helps Define Who You Will Be Tomorrow.**





## Oil India

A responsible corporate citizen



**Tridiv Hazarika, Manager (PR), OIL,** A Post Graduate in Communication Studies as well as Business Administration with a background in Economics, Tridiv is presently working as Manager in OIL's Public Relations and Corporate Communication Department and has been recently appointed as additional Spokesperson of OIL.

### OIL's CSR Project Rupantar showcased in World Petroleum Congress

The 20th World Petroleum Congress was hosted by Qatar Petroleum and took place at the Qatar National Convention Centre (QNCC) in Doha, Qatar from 4th to 8th December, 2011. Since its establishment in 1933, this was the first time that the World Petroleum Congress was being hosted in the Middle East. It is the largest and most reputable oil and gas industry gathering in the world, with over 5000 delegates, 600 media and 550 presenters. Known as the "Olympian Event of the Oil and Gas Industry", the theme of this 20th Congress was 'Energy Solutions for all – Promoting Cooperation, Innovation and Investment'. In this Congress, a special initiative 'Social Responsibility Global village' was put up wherein the best CSR initiatives were showcased and presentations on successful case study were also made on the occasion. Between all the stands promoting the technology and services of the world's major oil and gas players, the Social Responsibility Village at the World Petroleum Congress (WPC) exhibition highlighted some of the most sustainable and effective charity and development programmes currently being conducted by oil and gas companies around the world.

World Petroleum Congress had called for case studies from across the world. 'Project Rupantar', an ongoing CSR Project of OIL, to develop and support Self Help Groups was selected as one of the 12 best case studies amongst corporate initiatives carried out in the global oil and gas industry. Manager- Public Relations & Secretary of the Project of OIL presented the case study on success of the Project Rupantar. The case study was the lone project from entire Asian sub-continent.

In the presentation it was showcased how successfully Oil India Limited has been operating this community development programme in

Assam in northeast India to help develop the local economy in a way that prevents dependence on the oil and gas business. It was also underlined how the programme started as a self-help group for women who were taught marketable and useful skills to help people earn money and run their own businesses. The presentation highlighted the significance of the project as a result of which Assam's female residents could now generate their own income by turning locally produced resources and materials into value added products.

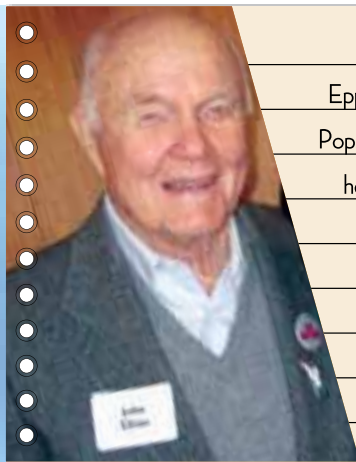
Project Rupantar addresses the huge challenge of growing unemployment in and around Oil India Limited's operational areas in India's north eastern state of Assam by creating avenues for sustainable livelihood through Self Help Groups (SHGs). The SHGs are provided structured trainings, grants, government subsidies and access to credit from financial institutions and markets, so as to enable them to take up various

economic activities like Farm Mechanization for multi cropping, production of diversified handloom products with special focus on eri and muga (world famous golden silk of Assam), poultry farming, pig breeding, duck rearing, fishery, sericulture, organic farming etc. The project is creating self employment avenues, promoting entrepreneurship in the region, generating sustainable sources of livelihood, alleviating poverty and empowering women. Over 4000 Self Help Groups encompassing 200 villages, covering 30000 families have been formed with the help of project implementation partner - the State Institute of Rural Development (SIRD), Assam and support from nationalized banks.

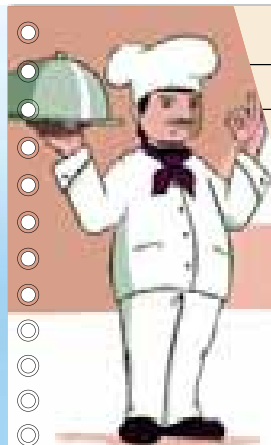
A Coffee Table Book on the Project was also published on the occasion of the World Petroleum Congress. The local Press covered Oil India's presentation and appreciated the work done by it for the upliftment of the people in its operational areas.



Mobile dispensary service in remote areas of Assam.



California's Frank Epperson invented the Popsicle in 1905 when he was 11 years old.



Haute cuisine or 'high cuisine' has its foundations in the 7th century with a chef named La Varenne. As author works such as Cuisinier françois, he is credited with publishing the first true French cookbook.

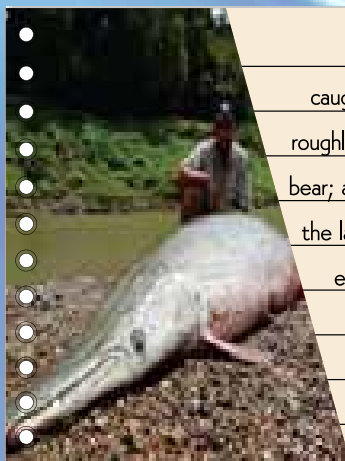
## Did You Know ?



An Indian restaurant in London celebrated the DVD release of 'Slumdog Millionaire' by making the most expensive curry in the world. It was called 'Samundari Khazana' (seafood treasure) and cost \$2,000.



ABOUT 27 MILLION Coca-Colas will be consumed worldwide during the next hour. That's over 600 million per day.



The largest fish ever caught is a catfish that is roughly the size of a grizzly bear; at 9 feet long, this is the largest freshwater fish ever to be caught and photographed. It was caught in the Chiang Khong, Thailand.



China's Beijing Duck Restaurant can seat 9,000 people at one time.





# Mind Benders

## Quiz 10

1. The origins of this song date back to a kindergarten class in the mid 19th century and the Warner Music Group (Time Warner) which owns its copyright earns approximately \$ 5000 per day (\$2million per annum) in royalties. Name the song.
2. Carl Linnaeus the famous Swedish taxonomist's most persistent attempts to grow this particular crop in Europe during the 1700s failed after 20 attempts. After ages the first commercial crop of this plant variety was harvested in 2005 in Cornwall, UK. Name it
3. Who is shutting down their high profile retail initiative Super Circle of Excellence?
4. Which brand claims to have launched the first tablet computer exclusively for women?
5. What has moved from a safe-deposit box at the SunTrust Bank, where it has resided for 86 years, into a vault at the Global HQ of the company that owns it?
6. What is common to the capture of Osama Bin Laden and the Leela Palaces and Hotels group?
7. What is Fear Index and name the person who coined the term?
8. The brand identified by the lines "Go Your Way" is making its way into India. Name it
9. Which famous founder CEO's words are these "I want to put a ding in the Universe"?

10. Identify this organisation founded by an Asian American that gets funding from the Bill and Melinda Gates foundation and Google.



11. Identify the company from its logo which was in the news recently



### Winners of Synergy Quiz No. 9

1. Mrs. N. Ratna
2. Mr. K. Radhakrishnan

### ANSWERS TO QUIZ IN SYNERGY QUIZ 09

1. You Tube
2. Organisation of the Petroleum Exporting Countries (OPEC)
3. Sherlock Holmes
4. J.Jayalalitha
5. Congress (I)'s candidate Roster Sangma and Independent candidate Chamberline Marak. The winner was selected by a toss of coin after which Marak was declared winner.
6. Stilleto Heels
7. Jyothy Laboratories
8. Barbara & Ken
9. Lego
10. Vimal Suitings

## Production of Crude Oil and Natural Gas

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
<b>1. Crude Oil Production ++ ('000' Tonnes)</b>						
<b>(a) Onshore:</b>						
Gujrat	6251	6212	6177	5946	5960	5905
Assam/Nagaland	4474	4400	4257	4674	4740	4719
Tamil Nadu	104	109	102	102	131	116
Andhra Pradesh@	385	353	298	265	239	234
Rajasthan		-	-	-	447	5149
<b>Total (a)(includes Andhra Pradesh offshore)</b>	<b>11430</b>	<b>11325</b>	<b>11213</b>	<b>11276</b>	<b>11821</b>	<b>16428</b>
of which						
OIL	3234	3107	3100	3468	3572	3582
ONGC	8095	8058	7921	7565	7515	7446
JVC/Private	101	161	192	243	734	5400
<b>(b) Offshore:</b>						
ONGC	16309	17993	18020	17801	17340	17002
JVC/Private	101	161	192	243	734	5400
<b>Total (b)</b>	<b>20760</b>	<b>22662</b>	<b>22905</b>	<b>22233</b>	<b>211869</b>	<b>21284</b>
<b>Grand Total (a+b)</b>	<b>32190</b>	<b>33988</b>	<b>34118</b>	<b>33508</b>	<b>33690</b>	<b>37712</b>
<b>2. Natural Gas Production</b>						
<b>(a) Onshore:</b>						
Gujrat	3831	3294	2931	2605	2444	2263
Assam/Nagaland	2408	2526	2598	2573	2703	2682
Arunachal Pradesh	48	35	30	30	40	44
Tripura	480	520	534	553	564	610
Tamil Nadu	906	1130	1169	1242	1178	1119
Andhra Pradesh@	1663	1525	1567	1524	1479	1384
Rajasthan	242	242	255	216	239	432
West Bengal\$ (CBM)	-	-	15	20	38	41
<b>Total (a) (includes Andhra Pradesh offshore)</b>	<b>9578</b>	<b>9272</b>	<b>9099</b>	<b>8763</b>	<b>8685</b>	<b>8577</b>
of which						
OIL	2270	2265	2340	2268	2416	2350
ONGC	5751	5876	5877	5753	5634	2350
JVC/Private	1557	1131	882	742	635	720
<b>(b) Offshore:</b>						
ONGC (Mumbai High)	16823	16567	16457	16733	17462	17591
JVC/Private	5801	5908	5861	7348	21350	26054
<b>Total (b)</b>	<b>22624</b>	<b>22475</b>	<b>23318</b>	<b>2408</b>	<b>38811</b>	<b>43645</b>
<b>Grand Total (a+b)</b>	<b>32202</b>	<b>31747</b>	<b>32417</b>	<b>32845</b>	<b>47496</b>	<b>52222</b>

Notes: Provisional  
Source: ONGC, OIL and DGH.

++Includes condensates  
\$: Coal Bed Methane Production



Printed on environment friendly paper that comes from responsibly managed forest. Please join us in the effort to conserve our forest resources by recycling paper.