

Military application of satellites

VICE ADMIRAL SARWAR JAHAN
NIZAM, ndu, psc

MAN'S curiosity about the 'heavens' dates back, perhaps, to the beginning of history. Initially he fulfilled a desire to see into the depths of space by using telescopes but the ultimate desire has been to launch himself into space. This required understanding of the laws governing the motions of bodies around the planets. Johannes Kepler and Isaac Newton worked out the mathematical laws that govern the motion of bodies in orbit around the heavenly bodies. The laws of motion and the basic notion of differential calculus opened the door to the technology of artificial earth satellites.

With the launch of the Soviet Sputnik in 1957, the space age dawned. Since then spacecraft have turned out to be more important as military tools than as a means of satisfying man's desire to explore our solar system. In fact space has become a crucial environment for the military. This is because artificial earth satellites are the essential eyes, ears and nerves of the fighting forces today. Nothing on ground, air or ocean can remain a secret for long as the world has discovered to man's dismay. This important technology has a force multiplier effect on the capability of military forces.

The tactical implications of military application of satellite on maritime warfare would be of interest to any seaman in whose case the sea can no longer be a hiding place far from the shore. With increased availability of satellite-derived command, control and scouting information, the limitations and capabilities of such platforms need attention of

planners/students of war.

Orbital characteristics

A satellite's orbit is usually elliptical with the center of the earth at one of the foci of the ellipse. The semi major axis and eccentricity of the orbit, the time of perigee passage, the right ascension of the ascending node, the orbital inclination and the argument of the perigee describe the size, shape and orientation of an orbit of a satellite in space.

Satellites in orbit

Satellite orbits are generally divided into three categories. There are:

Low Earth Orbit (LEO) from about 150 km to 1500 km.

Medium Altitude Orbits from 1500 to 35800 km.

High Altitude Orbits from geosynchronous altitude 35800 km and beyond.

Satellites in Military Functions

Of the several types of military satellites launched each year, three kinds are most important to the armed forces: i.e. reconnaissance, communication and navigation. Taken together they form part of complete information and warning system.

Surveillance

For performing the worldwide surveillance missions, space-based sensors are the only systems capable of providing continuous and complete coverage. Three surveillance missions are currently performed from the space. These are:

Early Warning. Early warning sensors located in geosynchronous orbit can provide warning of the intercontinental or submarine launched ballistic missile attack. By sensing the

missile height through the atmosphere, such systems add critical minutes to strategic warning and validate information by land-based early warning systems.

Nuclear Detonation. Sensors mounted on satellite can automatically sense nuclear explosions and determine where the detonation occurs, and information essential for strategic strike assessment.

Weather Monitoring. Satellite weather coverage has provided the ability to know about the weather of any point on earth's surface round the clock and forecast the same from weather photographs. Strategic weather information is usually obtained from geo-synchronous satellites while detailed tactical weather data (current information on cloud coverage) are best gathered from satellites in low sub-synchronous orbit (an orbit having 90 inclination). Wind and sea state can be invaluable to the tactical commanders in effectively employing his forces.

Reconnaissance

Military reconnaissance is similar to surveillance but focuses on obtaining detailed information of a specific nature. Strategically, space based sensors can observe enemy weapons development, verify compliance to arms limitations treaties and aid in strategic targeting. Tactically, satellites can determine deployments of land, sea and air forces prior to and during armed conflict. Intelligence information gathered from satellites can act as a force multiplier to the commanders. Knowing where the enemy is, how strong he is, and what he is doing will always be the most valuable information the commander can have, and often is

the decisive factor in battle.

Military reconnaissance

Military reconnaissance satellites can be divided into the following:

Photographic Reconnaissance Satellites. Satellites are used for photographic reconnaissance purposes from a low altitude orbit of about 200 km. There are two basic types of photographic reconnaissance mission. These are:

1. Area Surveillance. On area surveillance missions, a large area of interest is scanned for object of potential military interest using a wide-angle low-resolution camera.

2. Close-look Photographic Reconnaissance. For a close look Photographic Reconnaissance, the satellite houses a camera with a high resolution and relatively narrow field of view to rephotograph areas of particular interest during area surveillance mission.

Electronic Reconnaissance

Satellites. These are known as ears in the space and carry equipment designed to detect and monitor radio signals generated by the enemy's military activities. Signals originate from military communications between bases from early warning radars, air defence and missile defence radars or from those used from missile control are monitored by these satellites. These satellites help to locate systems producing electromagnetic signals and by analyzing characteristics of the signals, essential data may be found out for planning defence. For this, four receivers are used on four satellites to locate the position of an unknown transmitter on the earth surface. Such missions are suitable from and altitude of about 480-650 km.

Ocean Surveillance Satellites

Two types of satellites are used to monitor the oceans; one, the ocean surveillance satellites is used to detect and track military surface ships while the other, the oceanographic satellite, is used to determine various ocean properties. These satellites are normally placed at an altitude of about 500 km.

Early Warning Satellites. Warning time is a factor for defence against any attack. The use of artificial earth satellites can extend this warning time to a great extent by detecting the enemy missile as soon as they are launched. Most military satellites emit infrared radiation at varying degrees. Early warning satellites detect military targets by use of sensors sensitive to the infrared radiation.

Use of satellites for communication

Satellites are used extensively for military communication. Military satellites use UHF (9225-3400MHz) and SHF (7.2-8.4GHz) and share these with terrestrial systems and other satellites. The other bands which are used for military satellite communication are 14/11 GHz, 30/20 GHz and 40/60 GHz. The availability of higher frequency bands allow enhanced traffic, increase protection from jamming and lower probability of intercepting transmissions from covert terminals. Satellite communication system has a number of advantage which

are being extensively exploited for military applications. They include the following:

a. A single satellite can provide communication coverage over a large geographical area.

b. Satellite transponders have large transmission capacities that enable them to support high data rates.

c. The inherent flexibility has the advantage to control remotely and hence less vulnerable to direct attack.

d. They are physically remote and hence less vulnerable to direct attack.

Advantages offered by satellite borne terminals

In addition to above discussed general advantages, satellite borne tactical terminals offer following additional advantage which make communication through satellites more attractive to the military leaders:

a. They can provide communication in areas where coverage by terrestrial links is inadequate.

b. Mobile terminals allow communication to be rapidly established in areas where facilities are absent or destroyed.

c. They provide a service to mobile, shipboard and air borne terminals which are more reliable than HF terrestrial communications.

d. They surpass the conventional systems and simplify logistics for critical command and control network of serving forces deployed in a combat area.

Anti-jamming techniques

A satellite communication can be jammed on both up and down link.

Users by using spread spectrum modulation can suitably overcome jamming. Direct sequence and frequency hopping spread spectrum modulation anti-jamming techniques are suitable for military satellite application.

Satellite navigation

Use of satellite for Navigation has revolutionized the positioning anywhere on the globe. It offered the advantage of finding the position at any point on the global position at any time. Global Positioning System (GPS) has a significant impact on weapon delivery, accuracy and effectiveness of conventional and nuclear forces in missions.

Conclusion

Satellite technology, which has caused the earth to shrink to the size of a global village will make the ocean ponds. Nations are competing in space and many will join. Use of satellite for surveillance systems to detect, classify, track and target naval unit approaching a nation's sphere of influence politically or economically is becoming very common. Though we may not enter into this technology in the near future but it may well be used against us. Hence, its applications and limitations should be known to all of us in all their dimensions, both strategic and tactical.

This article has been approved by ISPR.

The author is Chief of the Naval Staff, Bangladesh Navy.



The Arab Summit and the US doctrine

KHALED KHALEFEH

THE Arab Summit, which was held on the 29th and 30th of March, 2008 in Damascus, Syria, faced serious regional challenges. This annual summit is usually held in a different Arab capital. The current Damascus Summit was defined by the failure to attend by Saudi Arabian, Egyptian, Jordanian and Lebanese leaders. These four countries made a tragic and strategic mistake by failing to attend the summit. They will become more vulnerable to Arab national voices, which will perceive them as collaborators with the United States.

During his last visit to the region, Dick Cheney insisted that friendly Arab regimes, such as Saudi Arabia and Egypt, do not participate in the Damascus Summit. According to American analysts, this summit, lead by Syria, would consolidate the Iranian influence in the Middle East and totally ignore the Lebanese agenda on the table.

The US policy, as one of the Iraq War aims, was to destroy any broad based consensus in the Arab political system. In this war, the Americans have not been able to achieve any of their goals. Nevertheless, they have been able to achieve one target, that of destroying this Arab consensus and of preventing the Arabs from working as one political unit, such as the European Union and the Latin American states.

The crucial question is why the so-called Arab moderate states are listening to the Americans. The answer is because these leaders perceive their national security interests as the same as American national security interests in the Middle East.

This situation has been continuing due to the Iranian hegemony in the Middle East. At the same time, the Saudis are not doing anything significant to deal with that hegemony. They rely on the American veto regarding any political solution in Lebanon.

The Saudis criticize the Harari government for not doing this or that, but at the same time they are not making any effort to be flexible or supporting the interests of their allies in Lebanon by encouraging dialogue with Hezbollah.

They are following the American doctrine of rejecting and containing an old policy that has reached bankruptcy since the 1980's.

Egypt's strategic vision also relies on the Americans because they receive civilian and military assistance. However, Mubarak regime is conducting a rigid policy toward the Palestinians, following American and Israeli influence. Mubarak is reacting to events and not making them, especially concerning the issues of entering Rafah and Hamas.

Eight Arab countries decided to send low profile Arab representatives to the summit. The Lebanese government did not even have a representative since they lost the lead on the initiative and on many Arab issues in this 20th summit. The Saudi initiative, which is now called the Arab Initiative, was proposed and adopted in 2002 and rejected by Israel, and was the first issue on the Arab table.

Nevertheless, as I tried to explain regarding Saudi Arabia and its boycott of the Damascus Summit, they are using the excuse of Syrian non-support of the Arab Initiative to solve the Lebanese constitution fiasco. The Saudis are using this Lebanese pretext in order to punish Syrian President Bashar al-Assad.

However, by monitoring the media's summit coverage, it seems that the Syrian camp has succeeded in ignoring both the Saudis and the Mubarak regimes. Kaddafi, in an outstanding speech that was broadcast in the Arab world, attacked Arab policies, especially concentrating on the Saudi monarchs. Other analysts argued that Saudi Arabia and the other Arab countries that boycotted the summit should appear and present their cases and their ideas in front of the Arab public.

The visits of Secretary of State Condoleezza Rice on the 29th of March 2008 and Dick Cheney in the middle of March were timed to communicate that their solution is preferable to the Syrian solution. Rice, by coming and meeting Olmert and Abu Mazen in Jordan, showed that the American solution is the only game in town, in contrast to the Arab Summit in Damascus.

Ms. Rice came to Israel, primarily

to spend time, although we can say that the US has succeeded in creating a split in the Arab camp.

However, US foreign policy looks very poor and without any purpose other than to neutralize any possibility of progress in the Middle East between the Arabs and the Jews.

Strategically, however, after this summit, the US actually has no real agenda to push the region forward and to convince the masses in the Middle East of the necessity of an American policy (see the harsh criticism of Amru Mousa, the Chairman of the Arab League, toward the US).

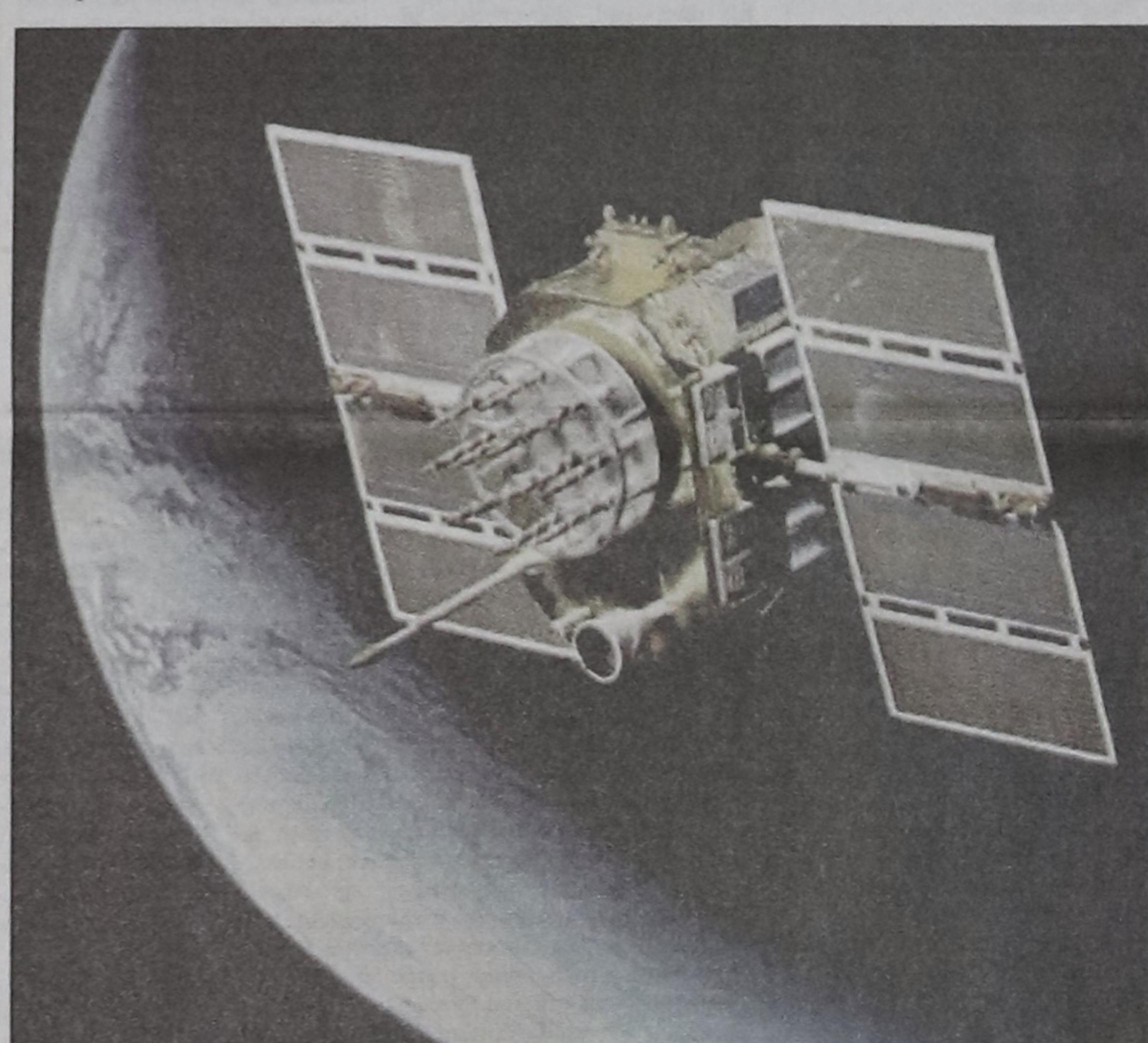
The current US administration will continue to give the impression that it is doing something until the end of its term. Rice met Abu Mazen on the 30th of March 2008 and talked about the political process. Abu Mazen received an invitation to come to the White House on 24th of April 2008 to discuss the process further.

Finally, on his visit to Israel on the 14th of May 2008, Bush will meet Abu Mazen again to talk about the process. The US, however, will continue to talk about the process forever. While this talking is going on, dangerous things are happening in Iraq and time is working against the interests of America.

Concerning Israel, the US is wasting time. The 14th Arab Summit in Beirut, which was held in 2002, adopted the Arab Initiative. This initiative has been on the table for the last six years without any response from Israel or the US. Currently in Damascus, this initiative might be ignored after it has been rejected by Israel.

All the files have been opened, but without any solution. The Lebanese file has not been solved and will be on the agenda with the possibility of escalation. The Palestinian file also has a great probability of escalation and polarization with the external support of Abu Mazen, the US and Israel. Finally, the Iraqi file is burning and escalating more and more after the decline of Maliki and the Bush Administration, and the starting of the spring offensive in Afghanistan.

The author is a journalist and member of The Arab Council for Foreign Relations.



Addressing political corruption is a new reality in Bangladesh

MOHAMMAD FARUK KHAN

POLITICAL Corruption" is in fact a matter of debate all over the world. In Bangladesh, the debate and discussion on political corruption is not anything new. I have had knowledge about this term since my boyhood during the Pakistan period. However, in view of the promulgation of emergency as per article 141A of the constitution on 11 January 2007 and various reform actions taken since then in Bangladesh, the topic has become a talk of the country and the people want a positive end to all kinds of corruption.

Political corruption is what I may define as misuse or inefficient handling of power by any person holding a public office, with a view to obtaining any illegal or extra legal gain and depriving people of their rightful gain, be it financial or otherwise. Like anywhere else in the world, political corruption in Bangladesh has many facets. The prominent ones are:

Taking financial or other benefits against award of projects, contracts for self or party fund.

Awarding projects to party men in exchange for favour during, before or after election.

Depriving lowest, experienced and efficient bidders from award of tender due to their political background, link or perceived link.

Forcing contractors to buy items/equipment from favoured company/persons at higher costs, forcing them to give subscriptions for political rally, forcing them to employ favoured but inexperienced persons, forcing them to join own political party or frontline organization, etc.

Changing project profile to suit own political requirements thus

causing losses to public fund.

Harassing genuine bidders with state machineries, i.e. police, NBR, ACC etc. for not listening to unlawful demands.

The basis for the struggle for independence of Bangladesh was a sense of deprivation that was caused due to wanton political corruption of Pakistanis. They not only looted away our share of national wealth but also deprived us of our rightful share in every aspect of national resource. However, it is a matter of shame that political corruption continued its legacy even after independence. Soon after Bangabandhu Sheikh Mujibur Rahman, the father of the Nation, was killed in August 1975, General Zia used political corruption to form his new political party "Bangladesh Nationalist Party" (BNP) primarily with the help of corrupt elements of different political parties, unscrupulous, corrupt and opportunist businessmen and anti-liberation forces. The next government of General Ershad and his political party "Jatiyo Party" (JP) was also formed in the same manner. In 1990, people's victory over autocratic government brought back parliamentary democracy; however, nothing significant happened during subsequent governments' rule to curb corruption in general and political corruption in particular.

In such a situation the opposition parties formed Combined Opposition Alliance, took vow to uproot all kinds of corruption and launched an all out movement. The positive result of the movement is 11 January change also known as "1/11 Reform". An analytical look into politics in Bangladesh and her corruption chain will clearly reveal the factors behind political corruption in our

country. The prominent ones are:

Autocratic Leadership: most of the major political parties do not practice a transparent democratic process in selecting leadership hierarchy. This is also partially applicable to selecting leadership at grass root levels and front organizations. The top leadership used to handpick leaders instead of party workers electing them. Thus the leadership chain is mostly maintained through a politically corrupt process which gave birth to all forms of corruption for the benefit of a handful. I hope common people and the political leaders together will choose honest, qualified and dedicated people to represent them in future.

actions against any corrupt practice. However much of this power had not been used, rather grossly misused.

Lack of anti-corruption awareness among people. It is unfortunate that the family, social, or religious values have changed for worse in Bangladesh over the years. Corrupt politicians are often viewed as smart, intelligent, efficient and on the contrary honest politicians as docile, simple and foolish. The civil society has also

countability and transparency' both being part of 'Good Governance'. I think the following measures are required to be taken to curb political corruption in Bangladesh:

- Ensure Good Governance at all levels.
- Honest and dedicated politicians are nominated for leadership through timely election to National Parliament. The following steps may be taken to bring effective leadership:
 - Posts of Chairman and General Secretary at all levels of political committees are filled by secret ballot through proper party council.
 - Nomination process is made more democratic. Grass root leaders of each political party in the constituency will forward to Central Parliamentary Committee 3/5 names of potential candidates chosen through secret ballot. Central parliamentary Committee will select one for party nomination.
 - Only honest, dedicated party men who have served the party and people for at least five years be chosen.
 - Real expenditure for election should be brought under limit.
 - Submission of wealth statement by all MPs, ministers and government officials up to Deputy Secretary be made compulsory every year.
 - Audit Report on political party fund is made public. Government may consider providing fund for election and running of the party on the basis of votes obtained in last general election.
 - Measures to