People's Liberation Army
Ground Forces Modernisation - An Assessment

GAURAV SHARMA

Introduction

In the last twenty years the People's Republic of China (PRC) has invested and matured on two fronts: the economic and the military front. The 'White Paper' series on Chinese National Defence have been issued every two years since 1998, but details about the Chinese military ground combat forces have been minimal. Also, China's total military-related expenditure for 2010 was estimated to be over $160 billion dollars[1] and in the past decade, China's military has benefitted from robust investment in modern hardware and technology.

The current Chinese capabilities and its intentions in the regional neighbourhood are unclear and viewed with scepticism. The study of Chinese Land based military capability is important to understand Chinese military modernisation, military posture, and China's role within its neighbourhood. As PLA attempts to integrate many new and complex platforms, and to adopt modern operational concepts, including joint operations and network-centric warfare, China's expanding military capabilities increase the risk of misunderstanding and miscalculation, in its regional neighbourhood. This paper seeks to provide an overview of China's current capabilities in five types of land based weapon systems – Tanks, Infantry Combat Vehicles, Air-Defence, Artillery and Infantry Layered Crew Served Weapons.

This article will focus on the Chinese ground forces weapon systems developed and in use by the PLAA (Army). The aim is to provide an overview of major advanced ground based weapon systems in use and assess the current strength (in numbers) of the PLAA ground forces weapon systems.

PLA's Military Doctrine and Command Structure

A RAND study asserts that

> *"…certain Chinese defence-industrial enterprises are designing and producing a wide range of increasingly advanced weapons that, in the short term, will enhance China's military capabilities.....and, in the long term, China's military position in Asia".*[2]

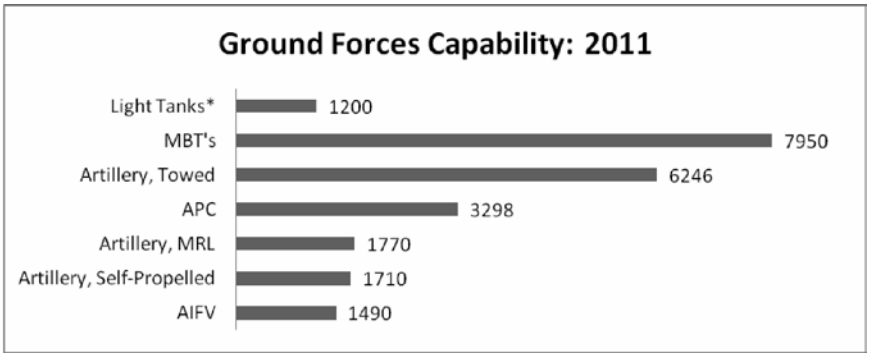
Beijing actively pursues the 'Core Interest'[3] which refers to China's long-term, comprehensive military modernisation, improvement in PLA's capacity to conduct high-intensity, regional military operations, including anti-access and area denial (A2AD) operations. The book '*Zhanyi Xue' or 'On Military Campaigns'* is used as a text instructing PLA officers on the new doctrine[4]. PLA's current general warfighting tenets are found in the ten 'Basic Principles of Military Campaigns' which inculcates integrated operations and key point strikes[5]. The General Armament Department (GAD) created in 1998, played a critical role in ensuring that military end-user requirements are served. The GAD looked abroad to acquire capabilities that best serve the PLA's requirements and played an important role in coordinating military strategy and doctrinal planning with weapons and technology developments.

Military Doctrine

Beijing is developing "*deep battle*" strike capabilities[6], making its forces highly mobile, agile and effective in the area of land warfare. PLA's operational doctrine emphasises on pre-emption, surprise and shock value[7]. PLA is engaged in an ambitious "generation leap" strategy – in a "double construction" transformation effort of simultaneously pursuing both the mechanisation and informatisation of its armed forces[8]. The current operational component of China's National Military Strategic Guidelines is known as "Active Defence" (jiji fangyu). The 11.2% increase in China's military budget[9] is a testament of PLA's continued investment in strengthening its 'Active Defence'.

China's defence white paper of 2004 had specifically acknowledged that priority has been given to the second artillery, navy and air force, to strengthen the "comprehensive deterrence and war fighting capabilities" of the PLA.[10] China continues to modernise its ground combat units indicating the evolution, sustenance and development of armoured brigades, air-defence brigades, and Short-Range Ballistic Missiles. Figure 1 provides an overall estimate of Chinese Ground Forces capability.

Figure1: *PLA Ground Forces Capability*[11]



Command Structure

The national level of command authority for PLA consists of three major organisations, divided further into three levels; mostly headquartered in Beijing as depicted in Figure 2. The Central Military Commission (CMC) is the supreme command and leadership organisation for the Chinese armed forces, headed by the PRC president and assisted by several vice-chairmans. CMC is inclusive of the four General Headquarters Departments and the Service Chiefs. The PLA is very much integrated with the CMC and sets a great example for civil-military co-operation, thus increasing 'jointness' in preparing for military options.

PLA Ground Forces are deployed in seven Military Regions (MR) across China that host a total of 18 Global Armies (GA), with each GA comprising of about 60,000 men[12]. Combat Ground Forces are comprised of four service branches – infantry, armour, artillery and air defence[13]. Four service arms helping the four combat arms are – aviation, engineering, chemical defence and communication and other specialised units, including Electronic Counter Measures (ECM), reconnaissance and mapping[14]. 10-20% of PLA combat forces across all the three services are combat ready called as 'Rapid

Reaction Forces (RRF)' at all times[15] maintaining a high level of readiness, better equipment and training. Figure 3 portrays the composition of a single Group Army.

Figure 2: *Chinese National Level Organisation*[16]

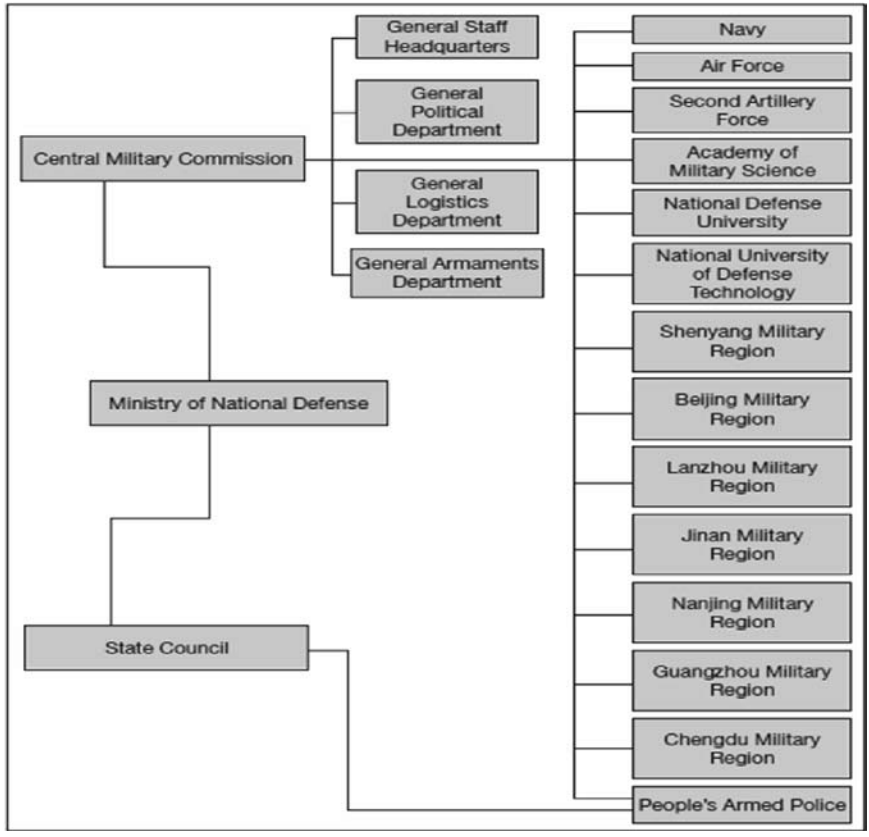
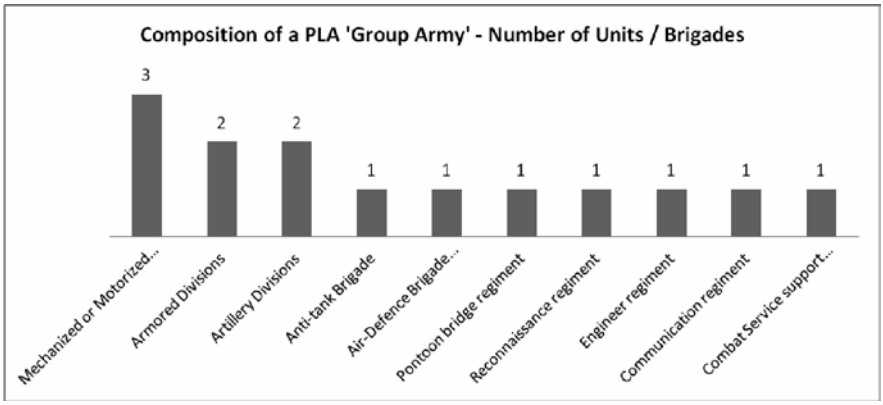


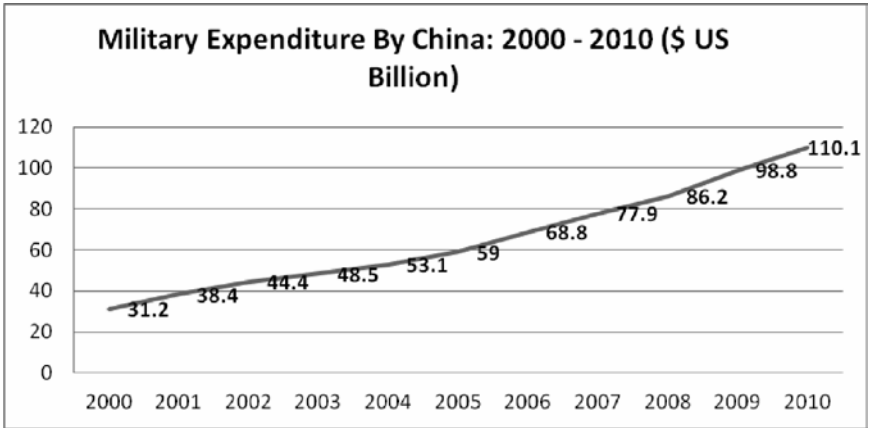
Figure 3: *Composition of PLA 'Group Army'*[17]



People's Liberation Army – Ground Forces Composition

The PRC's military expenditure from year 2000-2010 is depicted in Figure 4, which showcases China's vigorous and steady advances in its armed forces, thus strengthening PLA's planning and management efforts.

Figure 4: *China's Military Expenditure*[18]



The PLA has about 1.25 million ground force personnel. Under "Active Defence," ground forces are tasked with defending China's borders, ensuring domestic stability, and exercising regional power projection. PLA ground forces are transitioning from a static defensive force allocated across seven internal military regions (MRs) (oriented for positional, mobile, urban, and mountain offensive campaigns; coastal defence campaigns; and landing campaigns) to a more offensive and manoeuvre-

oriented force organized and equipped for operations along China's periphery. The 2010 Defence White Paper[19] asserts that the ground force has:

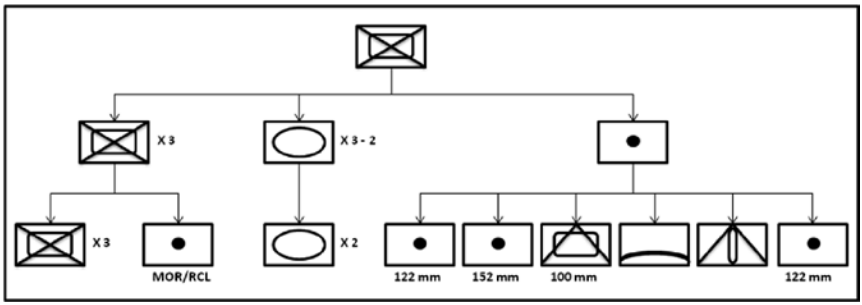
> *"emphasized the development of new types of combat forces, optimized its organization and structure, strengthened military training in conditions of informatization, accelerated the digitized upgrading and retrofitting of main battle weaponry, organically deployed new types of weapon platforms, and significantly boosted its capabilities in long-distance manoeuvres and integrated assaults".*

China's ground force modernisation programmes include production of new tanks, armoured personnel carriers, and artillery pieces. There have been advances in almost every area of PLA ground forces with new production capacity to accommodate surge requests. Examples of ground unit modernisation include the Type 99 third-generation main battle tank, a new-generation amphibious assault vehicle, and a series of multiple rocket launch systems. In October 2010, the PLA conducted its first Group Army-level exercise, which it called ~~M~~ISSION ACTION (SHIMING XINGDONG). The primary participants from the Beijing, Lanzhou, and Chengdu Military Regions practiced manoeuvre, ground-air coordination, and long-distance mobilisation via military and commercial assets as they transited between Military Regions. Given that these MRs are located along China's land borders, especially India, the exercise scenarios are based on border conflict scenarios and rules of engagement in case of a limited conflict.

PLAA now favours brigades in relation to divisions. There are currently seven mechanised brigades in the PLAA and five out of these seven are considered to be elite formations. The mechanised brigades are divided into light and heavy, with each heavy equipped with wheeled Armoured Personnel Carriers (APCs) such as Type 92/92A. The light consists of tracked Infantry Fighting Vehicles (IFVs)/ APCs such as Type 63/89. All mechanised brigades consist of at-least one or two battalions of tanks and three battalions of infantry. All Chinese battalions follow the 3+3 organisation of three companies with three platoons. The brigade commander has direct control over an artillery regiment. This consists of one battalion each of the 122mm and 152mm howitzers with one company of 122mm multiple rocket launchers (MRLs). In addition, each infantry battalion consists of one platoon of 82mm/100mm mortars and two platoons of 82mm/120mm recoilless rifles. There is also a mixed air-defence battalion and an anti-tank(AT) company with 100mm AT guns and two platoons of AT missiles (HJ-8/HJ-73 – discussed later).[20] Figure 5 shows the organisational chart of the PLA brigade formation.

PLA Brigade Formation

Figure 5: PLA – Army Brigade Formation*[21]

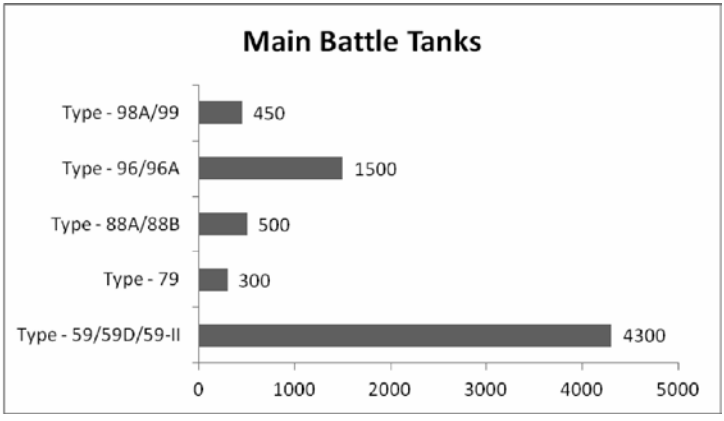


Tanks And Infantry Combat Vehicles (Icvs)

Tanks

Main battle tanks still serve a role as one of the main weapon systems for a high-intensity offensive or defensive land war. The PLA's total holdings of tanks are shown in Figure 6. China has very "tank heavy" forces, and its total holdings of main battle tanks of 7,580 tanks outweigh any regional power, except Russia. Ratios between modern and total main battle tanks with PLA has steadily increased and now stands at 40:100. Given the speed of force modernisation and continuing funds and research efforts provided, the increase of modern tanks as a share of the total inventory is likely to continue.

Figure 6: *PLAA Main Battle Tanks*[22]



The PLAA has combined the Russian and Chinese indigenous technologies and has produced some of the best in class of ICVs.

In 1999, China started a new 9958 Main Battle Tank (MBT) Project that took its elements from the earlier 9289 project under the leadership of the China North Industries Corporation (NORINCO). The new MBT is called the CSU 152 heavy combat vehicle and is understood to have commenced its trials programme in 2003. It is believed that Russia may have supplied China with some of the technology for CSU 152 in an effort to obtain valuable foreign exchange, in order to fund its own tank development programmes. No current information has been released by the Chinese on the current status of the CSU 152 MBT[23]. Also, specifications of CSU 152 remain unknown.

The most advanced tank currently in front line service with the PLAA is called the Type-98, with significant improvements in the key areas of armour, mobility and firepower. Further development of Type-98 has resulted in Type – 99. The Type – 99 is also known as WZ123. Type – 99 provides significant improvement in firepower, mobility and protection and is termed as a 'high end' tank.[24] The Type-99 is in quantity production for the PLA and was initially deployed by two elite armour regiments in Beijing and Shenyang military regions respectively.[25] The Type-99 is based on the Russian T-72 chassis and has modern features in every aspect of tank building. While other countries have experience with the laser dazzle device, the PLA is the first country to operationally deploy such a system on both, MBT's Type – 98 and Type – 99. The PLA also has Type 90-II MBT, Type 85-III, Type 85-II, the Type-80 – also called the 'Second Generation' MBT, Type -79, Type -69, and Type-59 – the earliest of the MBTs with China supplied by Russia in early 1950s[26].

PLA also has three variants of 'Light Tanks' in excess of 800, namely – Type 05 AAAV ZTD-05, 200 Type-62 and 400 Type-63A.

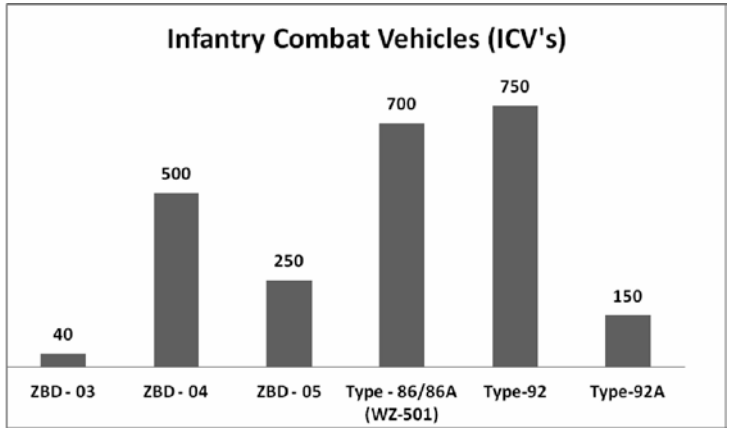
Infantry Combat Vehicles (ICVs)

The Infantry Combat Vehicles (ICVs) or infantry fighting vehicles as they are commonly known, have bridged the gap between the infantry and armour in the PLAA. The PLAA has combined the Russian and Chinese indigenous technologies and has produced some of the best in class of ICVs which are both, amphibious and have a good cross country capability. The 1997 China–Russia technology co-operation agreement yielded its first fruits in 1999 with the delivery of the first upgraded '*Boyevaya Mashina Pekhoty' (BMP)* (English Translation – Infantry

Fighting Vehicle) BMP-3 series fire control system, along with associated weapons and ammunition. Since then, PLA has made good investments and has produced some of the best in class ICVs.

The famous and modern families of the ICVs constitute ZTS-04 and ZBD-04 series. ZBD-04 is the most powerful vehicle of its type deployed by the PLAA. ZBD-04 is fully amphibious and made its first appearance during the major parade of 2009. The NORINCO VP1 is another marvel of PLA's armoured personnel carrier (APC), fitted with a Nuclear, Biological and Chemical Reconnaissance (NBC) system, and an automatic fire detection and suppression system. Some of the famous ICVs possessed by the PLA include the ZBD-97, ZBL-09 and ZTS/ZBD-04 series which are all amphibious in nature[27], and Type 90 ICV variant, Type WZ501 ICV which are supposed to be direct copies of Russian Kurgan BMP-2 and BMP-1 respectively[28]. In addition, there is the Type YW307 and Type YW309 which is essentially a variant of the Type – 89 and Type – 85 APCs. All the mentioned ICVs possess advanced fire control, satellite navigation, night vision and advanced communication systems[29]. The development of ICVs has been done with multiple variants and some of the more specialised ICV versions include ambulance, command post vehicle and self propelled mortar. The high mobility ICVs empower the motorised Infantry brigades in high altitude areas neighbouring India – the region of Ladakh and conflict area of Aksai Chin, and their deployment in the region will alter the security advantage in China's favour. Figure 7 provides a snapshot view of the current numbers of ICVs in service with the PLA.

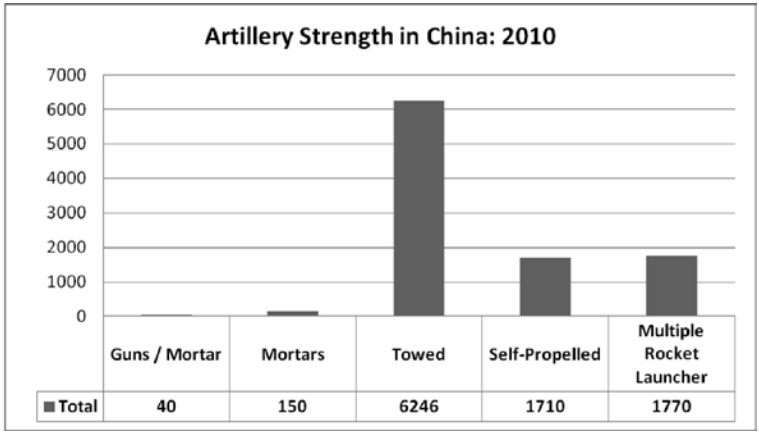
Figure7: *PLAA Infantry Combat Venhicles*[30]*



Artillery

PLAA maintains a large inventory of artillery pieces, including towed field artillery howitzers, self-propelled howitzers, and multiple rocket launchers. An estimated Artillery Strength in China for the year 2010 is shown in figure 8. The PLA ground forces artillery branch commands a small number of ballistic missiles too. Trends show that the total number of artillery is increasing slightly, with a greater share of self-propelled howitzers in service. The total number of towed howitzers in the year 2006 had increased by almost 17% in comparison to the year 2000.

Figure 8: *PLA – Artillery Strength 2010*[*31]



Guns and Howitzers:

- **Self-Propelled Guns and Howitzers (Tracked):** The 2009 parade commemorating the 60th anniversary of the formation of the People's Republic of China (PRC) showcased many new artillery weapons for the first time. This included a new 155mm self-propelled artillery system called the PLZ-05 and 122 mm self-propelled gun howitzer (SPGH) PLZ-07. It is believed that Chinese defence officials made a close study of the 2S19M1 155 mm/52 calibre prototype system developed by Russia and that the new PLZ-05 is based on this analysis. The new NORINCO 155mm PLZ-05 fires the standard North Atlantic Treaty Organisation (NATO) artillery ammunition. The PLZ-05 has a range of up to 50 km due to the development of new Extended Range Full Bore (ERFB) high explosive projectile ammunition.[32] PLZ45 is another of standard production 155 mm/45 calibre Self-Propelled Gun (SPG) that has

been exported to Kuwait and Saudi Arabia in significant numbers.[33] The PLZ-07 (122mm SPGH) has been developed to supplement and eventually replace some of the older 122 mm self-propelled howitzers like the 122 mm Type-89, 85, 70 and 70-1. The SH-3 is another 122 mm self-propelled howitzer (SPH), replacing the older 122 mm SPH systems. The Type-83, 152 mm is another SPGH in service with the PLA.[34]

- **Self-Propelled Guns and Howitzers (Wheeled & Towed):** In 2007, NORINCO revealed that they had completed the development of a new 155 mm/52 calibre self propelled (SP) (6*6) artillery system (SPAS) called the SH-1 and 122 mm SPAS called SH2. The SH1 can also fire the NATO 155 mm artillery and locally manufactured 155 mm laser homing projectile for pinpoint accuracy which is based on the Russian Krasnopol design. It is claimed that SH1 is very accurate and it is fitted with a computerised fire-control system and also a fibre optic north seeking positioning and navigation system. Other SPAS include the Type 96 122 mm which is a copy of the D-30 Russian Howitzer. PLA is now heavily investing in the development of fleet of 'Wheeled Armoured Fighting Vehicles' (WAFV) with the 122 mm (8*8) self-propelled artillery system being at the forefront of development.[35] Further development of the SH series has resulted in the SH5 105 mm SPAS with the major difference being the ordnance used.[36] NORINCO is also marketing three towed 155 mm artillery systems the AH1 155mm/45 calibre, AH2 155mm/52 calibre and the AH4 155mm/39 calibre. The AH4 is claimed to use advanced materials and is lightweight, similar in appearance to the BAE Systems Global Combat Systems 155 mm/39-calibre M777.[37] The other towed artillery guns include the 152 mm Type 83 equipping the reserve artillery units and the 152 mm Type 66 similar in appearance to the Russian D-20. The 130 mm Type – 59, the first of the towed arty guns manufactured by NORINCO is a virtual direct copy of the Russian 130 mm M-46.[38]
  - **Multiple Rocket Launchers:** China holds an inventory of about 2,400 multiple rocket launcher systems (MRLS). Longer-range artillery includes the Type-96 320mm MRLS, that can reach up to 200km with WS-2 rockets. Reports indicate that ongoing MRLS extensive development includes the Wei Shi series. The 400 mm WS-2 (Wei Shi 2) series has been developed by the Sichuan Aerospace Industry Corporation (SCAIC). The WS series is being developed to bridge the gap between conventional towed and self-propelled artillery systems and tactical missile systems. The WS-6

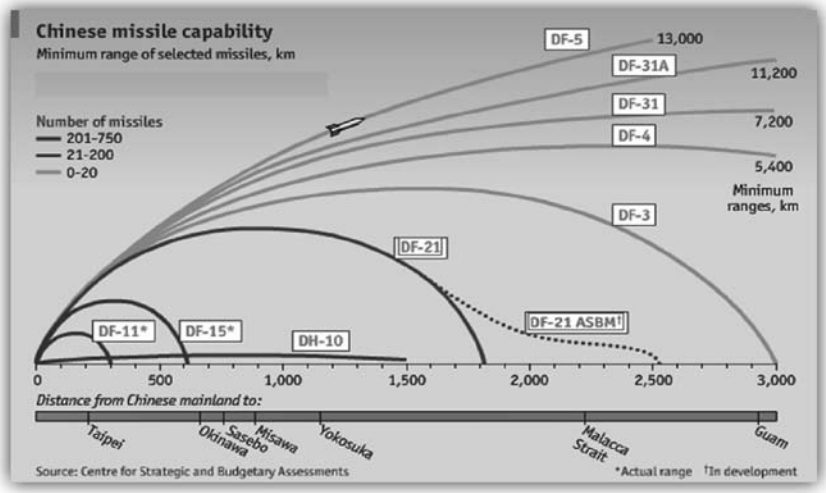
122 mm Multiple Launcher Rocket Weapon System (MLRWS) is the latest in the series. Beijing has also developed the 300 mm calibre (8-round) ANGEL-120 multiple rocket launchers with guided rockets. The lethal radius of one rocket round is stated to be 100 m while a full eight-round salvo can cover a 300 m radius.[39] The ANGEL-120 has high mobility, long range, high accuracy, great lethality and high volume of fire. Jane's Armour and Artillery reports that some PLA ground forces units are receiving the 300mm A-100 MRLS, which is based on the Russian Smerch. The A-100 is reported to have global positioning system, a fully computerised targeting, and potentially advanced ammunitions. Chinese sources indicated that the new A100 MRS has been developed to bolster the PLA's surface –to-surface firepower capability. Some of the other Multiple Launch Rocket System (MLRS) include the AR2 (12-round) and AR1A (10-round) 300 mm systems based on the Russian Spav 300 mm 9A52 – Smerch. Other prominent MRLS in service with the PLAA include the Type 90 (40-round), Type 81 (40 round), Type 83 (24-round) and Type 63 (12-round) – mostly belonging to the Soviet era of exports and re-engineered by NORINCO.[40]

- **Missiles - Short Range Ballistic Missiles (SRBMs):** The Pentagon has described China's missile programme as "the most active land-based ballistic and cruise-missile programme in the world".[41] It had been reported that in 1995, a complete Russian nuclear missile production facility had been transferred to China.[42] China has concentrated more on short and medium range missiles and the figure 9 provides their numbers and range. As of December 2010, the PLA had somewhere between 1,000-1,200 SRBMs. The PLA also continues to field advanced variants with improved ranges and more sophisticated payloads providing true *"precision strike"* capability.

The current account of Strategic SRBMs missile forces is speculated between 200 to 250 with DF-11/M-11A (CSS-7 Mod) around 120+ and 100+ DF-15/M-9 (CSS-6).[43] The HY or the CSS series of SRBMs have simpler S based nomenclature, for example the CSS-2 is called the *'Silkworm'* and the CSS-3 is termed as *'Seersucker'* and lastly the CSS-6 is called the *'SeaHorse'*.[44] The WS – 2 or the Wei Shi-2 is reported to be a low-cost guided SRBM, having variants like the WS-2C and WS-2D possesing a range of 300 km and 400 km respectively. It also has the short range guided ballistic missile – the Guided Guardian 2 or the WM-80, with a range of 80 km. All the SRBMs deployed by the PLA have

the capability of launching from both, ground and ship based platforms and mostly use solid propellant as fuel. Even going by liberal estimates, it is likely that this strategic missile strike force is going to increase at about 100 missiles year on year.

Figure 9: China's Missile Capability*[45]



The 600 km range CSS-6 and the 300 km range CSS-7 add a new dimension to the land based attack cruise missile system.[46] Many of these missile systems are fitted with satellite-navigation guidance for improved accuracy and have a potential to strike within a radius of 50 meters. Many new types of warheads such as cluster ammunition and fuel-air explosives are being fitted on these missiles for higher lethality. The DF-11 and DF-15 are the best in the world and even the anti-missile systems, like the Patriot are rendered ineffective against the DF class of SRBM missiles. Thus, the SRBMs provide a great strategic advantage to the PLA against India, especially in the Chengdu military region bordering the conflict north-east state of Arunachal Pradesh.

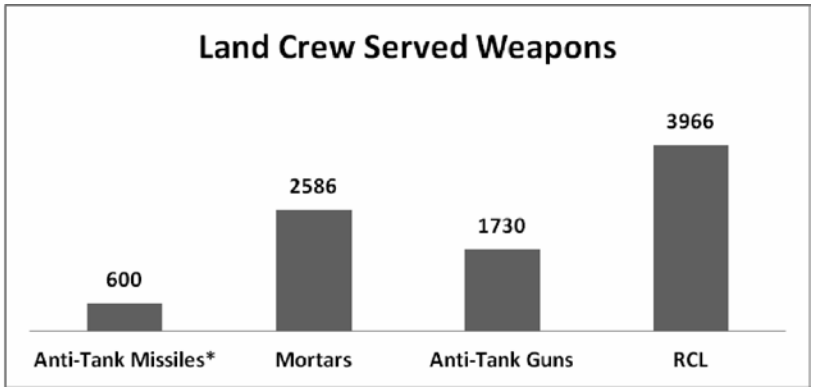
Air Defence

When the Soviet Union collapsed in 1991, China's air defence capabilities were of debatable effectiveness, built around indigenous clones of the Soviet S-75 Dvina and SA-2 guideline. In the last two decade, three Surface to Air Missile (SAM) divisions, one mixed SAM/Anti-Aircraft Artillery (AAA) division, and ten other air

defence brigades have been raised as part of PLAAF's air defence forces.[47] Figure 10 illustrates some known numbers for SAM systems.

The PLAA's air defence capabilities are transforming from a legacy force with static and un-deployable systems to a state of the art force, which is highly deployable in-country and demonstrably expeditionary as it matures. The scale of growth in the PLAA's capabilities is revealed in the full gamut of area and point defence SAM systems being deployed and developed.

Figure 10: *PLAA Air Defence Surface to Air Missile Systems*[48]*



Anti-Aircraft Guns & Missile System: The inventory of about 7,700+ air defence guns is phenomenal. Air defence divisions make up for large calibre weapons (37mm and higher) and the PLA is currently in stage of replacing its legacy air defence cannons with air defence missiles.[49] NORINCO has developed a Ground-Based Close In Weapon System (GB-CIWS) called LuDun (Land Shield) and referred to as LD2000 – the self-propelled anti-aircraft gun. The system could also be complemented with the 'Yitian' (described below) self-propelled surface-to-air-missile system (SPSAM) providing an integrated multi-layer gun-missile air-defence system.[50] Two of the new anti-aircraft guns in service by the PLA are:

- Type 80 (twin 57 mm) and Type 95 (quadruple 25 mm)

PLA still maintains a high inventory of Towed-Anti Aircraft guns which hail from the Russian era. These towed anti-aircraft guns vary in calibre from 12.7 mm to 57 mm. Some of the prominent examples of towed anti-aircraft guns in service by the PLA are as follows:

- 23 mm Type 80 – The famous double barrel light anti-aircraft gun and a reverse engineered copy of Soviet ZU-23-2.

- 25 mm Type 85.
- 35 mm Type 90 – This is a licensed copy of the then Swiss Oerlikon Contraves GDF series.[51]
- 37 mm Types 55, 65, 74, 74SD and P793 – 37 mm series is a direct copy of the Soviet 37 mm M1939, with multiple advances incorporated in each advance versions to include radar fire control, high rate of fire and is suited to Chinese manufacturing methods. Type 74, 74SD are capable of engaging targets above clouds and at night and work in multiple configurations to include two guns and a PL-9C missile launcher.[52]
- 57 mm Type 59 – is a close copy of Soviet 57 mm S-60.[53]

The China Aerospace Science and Industry Corporation (CASIC) has developed a new family of Ground-Based Air-Defence (GBAD) systems with the export title of FL – (Flying Leopard).[54] FL class weapon systems are small vehicular highly mobile SAM systems having both, radar and electro-optical target tracking facilities.[55] China has also developed self-propelled anti-aircraft gun and missile systems (SPAAGM) called the FB-6A, FLG-1 and Type - 95. The FB-6A is a missile launching vehicle (MLV) which is almost identical to the US Boeing Avenger air defence system.[56] FLG-1 is another one of the FL based Air-Defence gun/missile system.

Surface-to-Air Missiles (SAMs): The air defence missile component of China's regional strategy includes long-range, advanced SAMs, such as the Russian SA-10 and SA-20 PMU1/PMU2, as well as the indigenously made HQ-16 and HQ-9. HQ-16 SAM is the newest of these weapons and have been designed to be modular and possess all-weather, all-direction and multidirectional interception capabilities, as well as resistent to electronic counter-measures (ECM).[57] The S-300 PMU-2 is widely used as part of a theatre missile defence system.[58]

The HQ programme is an indigenous SAM programme. HQ stands for 'Hongqi', which translates into '*Red Flag*' and the series consists of multiple indigenous versions inclusive of HQ-2A, HQ-2B, HQ-61A and currently HQ-16 and HQ-17 – all in service with the PLA. The HQ-7 also called FM (Feiming = Flying Midge)-80 is a shelter and container based surface-to-air missile system. The HQ-7 resembles the French Crotale SAM system and similar in physical and technical characteristics.[59] A newer SAM series called as Lieying-60, translated to '*Falcon*' has been deployed by PLA since 1994 and is similar to the Italian Alenia Aspide.[60]

China has developed several newly designed self-propelled surface-to-air-missile (SPSAM) systems with the help of China Aviation Industries Corporation (AVIC I), and its subsidiaries like the China Air-to-Air Missile Research Institute (AAMRI). The China National Precision Machinery Import and Export Corporation (CNPMIEC) developed the FT-2000, a Chinese enhancement to the Russian S-300PMU/PMU1 missile system.

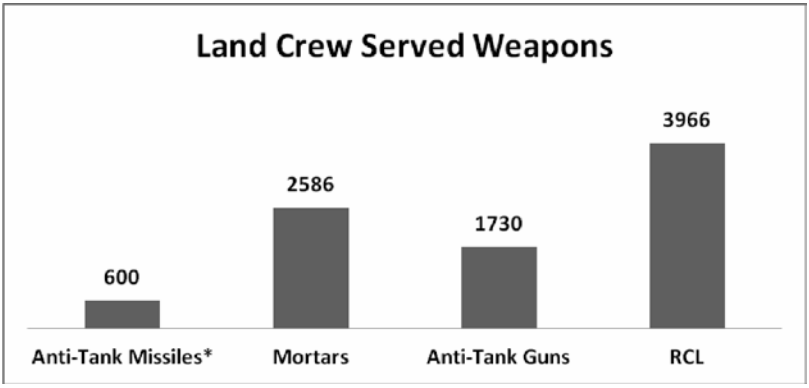
The SA-2 remains numerically significant and it has been further upgraded. In addition, the Patriot class S-300PMU, SA-10 Grumble and SA-20 Gargoyle long range SAMs have been acquired in strategically significant numbers. The Tor M1/SA-15 have been deployed and a range of indigenous short range SAMs has been developed, by the PLAA. While most of the PLA's investment in SAMs has been focused on expanding and enhancing the long range area defence coverage, much effort has been put into the modernisation of point defence SAM capabilities also China is also offering the sale of the FM-90 SAM and the HQ9 (Chinese in country name)/FT-2000 to the international market with the suspicion that either Pakistan or Iran may have already acquired these systems. FT-2000 and FT-2000A are supposed to be highly developed SAM systems comparable to the US Patriot system and the Russian S-300P family.

China is also promoting low altitude SAM systems. PL-9C/D and Yitian are the preferred SAM systems that the PLAA has in service. The Chinese call PL-9C either 'Pili', meaning 'Thunderbolt' or 'Pen Lung' meaning 'Air-Dragon'. The PL –9C is similar in appearance to the Israeli Python 3, which is a single missile launch platform possessing the single-shot kill probability (SSKP) of 0.8 for an approaching target. Yitian is a new modular design SPSAM, first promoted in 2004/05 by NORINCO. Yatian provides mobile air-defence capability for mechanised units against Unmanned Aerial Vehicle (UAVs), helicopters and cruise missiles in addition to providing close-in protection against high value targets like command centres.[61] There are 8 missile bases in Tibet, inclusive of 80-100 medium range and short range missiles.[62] With increased accessibility to the Tibet heartland, these missile bases translate into a direct threat to mainland India.

Infantry – Layered Crew Served Weapons

The Infantry Layered Crew Served Weapons (LCSW) with the Chinese military are mostly identical copies of Russian, American or French manufacturers with minor dimensional differences. Figure 11 provides an estimate of the Layered Crew Served Weapon systems with the PLA.

Figure 11: PLAA Land Crew Served Weapons*[63]



Mortars: China has a diverse variety of mortars both in calibre and range. Most of these mortars are offered for export sales to the international market. The following varieties of Mortars with Chinese state arsenals are listed as under.

- Jerboa 50 mm silent grenade launcher – much of its concept and design appear to be French. It is intended to be light and simple portable weapon that produces no flash, sound or smoke as a grenade is launched.
- Type 55 120 mm mortar.
- Type 63-1 60 mm mortar.
- Type 67 82 mm mortar.
- Type 71 100 mm mortar.
- Type M-83A 60 mm mortar.
- Xinshidai Type W86 120 mm, Type W87 81 mm, Type W84 82 mm, Type W91 81 mm and Type W99 81 mm rapid-firing mortars – These mortars are part of a recent series of Chinese mortars which have been given a 'W' prefix to the Model number.

Anti-Tank Weapons: PLA possesses a large number of Anti-tank weapons both in form of guns and missiles. In total, an approximate 2006 weapons are possessed by the PLAA.[64] HJ-73 and HJ-8 are primary anti-tank guided missiles in service by the PLAA. Both these series have been modified, improved and made effective to be fired from tripods, vehicle mounts and from helicopters.[65]

- Red Arrow 8 guided weapon system is a second generation guided missile system intended to be used against tanks and other armoured targets.

Examples of the Red Arrow 8 were encountered during the internal conflicts in former Yugoslavia.[66]

- Queen Bee 120 mm anti-tank rocket launcher
- Type 56 40 mm, Type 69-1 40 mm and Type 70-I 62 mm are all examples of anti-tank grenade launchers known to be in service with the Chinese armed forces.
- Type 2004 portable rocket launcher
- PF89A 80 mm and PF89-1 80 mm are two variants of anti-structure and light anti-armour weapon

The build-up of military regions in Tibet and Chengdu would help mobilize the PLA strike force to conduct fast paced operations and military exercises close to the borders.

Automatic Grenade Launcher and Cannon: Most of the AGLs are inspired by Russian designs. The QLZ87 enlisted below was first shown in International Defence Exhibition and Conference (IDEX) March 2003 and is supposed to be an improvement over the design W87 35 mm (also mentioned below).

- NORINCO 30 mm automatic grenade launcher.
- Type QLZ87 35 mm automatic grenade launcher.
- Type W87 35 mm automatic grenade launcher.
- Type LG3 40 mm automatic grenade launcher.

China has NORINCO 23 mm chain gun, whose existence was discovered in March 2001, which is reportedly based on a former US chain gun design, which was exported to China in early 1990s. Very few details of the gun have so far been released and the exact nature of the ammunition is also uncertain[67].

Why the PLA's Ground Combat Forces matter?

China's between the countries assertiveness towards India and the long-standing border dispute have always been critical in the regional security context. China's bolstered military presence in Tibet and its involvement in infrastructure projects in South Asia is suspicious due to the potential for dual civil-military use. The concerns are genuine as China is heavily developing the 4000 km line of actual control (LAC), and building road, rail lines and airports, thus providing enhanced and quick access to the PLA into the region. The extension of world's highest railway line from Lhasa (the capital of Tibet) to a city called Xigaze, near the Nepalese border, the extension of the railways in the east towards Nyingchi,[68] less than 50 km from the LAC in Arunachal Pradesh and the fifth functional airport in

Tibet in Xigaze are all signs of China's continued assertive stand along the LAC.

The build-up of military regions in Tibet and Chengdu would help mobilize the PLA strike force to conduct fast paced operations and military exercises close to the borders. There are 17 secret radar stations, 8 missile bases, 14 military airfields, more than 100 short and medium range missiles and troop deployment in excess of 2, 00,000 only in Tibet[69]. This transcends into a direct ground based military threat to the Indian sub-continent. The Tibetan and Xinjiang MD units are manoeuvre formations under the direct control of MR's and are independent of Group Armies, thus providing better operational flexibility and changing assertive postures for PLAA, against any possible aggression into India. Also, the primary military posture of both Tibetan and Chengdu Group Armies is *'Defensive, Offensive CT'*[70] which is a dangerous position, bearing in context the unresolved border disputes between India and China.

In addition, the Short Range Ballistic Missile (SRBM) program and cruise missile program is a cause of concern and projects serious security implications for India.[71] The PLAA's continued development of new types of combat forces, retrofitting of main battle weaponry, deployment of new types of weapon platforms, boosted capabilities in long-distance manoeuvres and integrated assaults with improvements in combat system (combining heavy, light, amphibious and air borne assault) will prove effective in carrying out precision operations and tactical in-depth strikes.[72] The PLA has intensified joint operations, advances in development of high-tech weaponry and equipment; and developing new types of combat forces in order to win 'local wars' swiftly.[73] This evolution in capabilities has been sufficient to elicit alarm for India and India needs to prepare credible deterrence against any such eventuality.

Conclusion

The PLA has moved towards smaller and more mobile forces. It has disbanded dozens of heavy divisions and created smaller brigades – producing a core of mobile mechanised forces and motorised functions. PLA has also inducted 'special mission battalions' for quick-reaction missions and rapid deployment. The formation of 'combined battalions' from a company-sized unit to a dozen different branches of the armed forces, has significantly improved the operational flexibility of the PLA. The integration of the civilian transport network into PLA's logistical infrastructure has provided efficient troop transport and dramatically increased the mobility of PLA ground formations, especially in Southern Tibet and along the disputed Sino-Indian border. The civil-military cooperation has

allowed PLA to deploy its key formations faster, thus enhancing its military might along the borders and consolidating more effective control in remote regions.

The Chinese Central Military Commission and the PLA headquarters visited 14 neighbouring countries in 2011, and had profound cooperation in military exercises. This is indicative of military diplomacy projecting PLA's military might in the region. As China continues to focus on developing its military operations within Asia and invest in long-range power projection by investing in aircraft carriers, heavy bombers, strategic transport, amphibious assault vehicles; by 2025 PLA will definitely be a formidable force to reckon in both Asian and global context. People's Republic of China will gain a formidable regional power-projection capabilities and PLAA ground forces would be at the forefront of this hard-power projection wherewithal.

Gaurav Sharma is a Research Assistant at CLAWS.

Notes

1. Recent Trends in Military Expenditure, http://www.sipri.org/research/armaments/milex/resultoutput/trends , accessed on 10-Jan-2012
2. Evan S. Medeiros, Roger Cliff, Keith Crane, James C. Mulvenon, "A new direction for China's Defense Industry", RAND Project Air Force, Santa Monica 2005, pp. xv –xvi
3. Yoshihara Toshi, James R. Holmes, Can China Defend a "Core Interest" in the South China Sea? http://project2049.net/documents/pla_third_department_sigint_cyber_stokes_lin_hsiao.pdf , accessed on 31-Jan-12
4. Dennis J. Blasko, The Chinese Army Today: Tradition and transformation for the 21st century, p - 98
5. Ibid
6. Annual Report to Congress, Department of Defence, United States of America, '*Military Power of People's Republic of China'*, 2006, p-15
7. Richard A. Bitzinger, S. Rajaratnam School of International Studies Singapore, The China Syndrome: Chinese Military Modernization and the Rearming of Southeast Asia, http://www.rsis.edu.sg/publications/WorkingPapers/WP126.pdf , p - 4
8. You Ji, "China's Emerging National Defence Strategy" in China Brief, 24 November 2004
9. China military budget tops $100bn, http://www.bbc.co.uk/news/world-asia-china-17249476, accessed on 06-Mar-2012
10. Information Office of the State Council of the People's Republic of China, China's National Defense in 2004 (Beijing, December 27, 2004), http://www.fas.org/nuke/guide/china/doctrine/natdef2004.html , accessed on 26-Jan-2012
11. Based primarily on material in International Institute for Strategic Studies, the Military Balance 2011 (London: Routledge, 2011). Figures do not include equipment used for training purposes. Some equipment figures are estimates. All equipment figures represent equipment

in active service. *Light Tank numbers are taken from 'Chinese Military Modernization and Force Development' Report by Centre for Strategic and International Studies
12. Cordesman H. Anthony, Martin Kleiber, Main Report, "Chinese Military Modernization and Force Development", Centre for Strategic and International Studies, August 11, 2006, p - 29
13. Military Balance 2011, Asia, China, p - 230
14. Ibid
15. Cordesman H. Anthony, Martin Kleiber, Main Report, "Chinese Military Modernization and Force Development", Centre for Strategic and International Studies, August 11, 2006, p - 29
16. Dennis J. Blasko, The Chinese Army Today: Tradition and transformation for the 21st century, p - 25
17. Based primarily on content taken from http://sinodefence.com/army/orbat/grouparmy.asp , Jane's Sentinel Security Assessment and the Military Balance 2011 (London: Routledge, 2011). Figures might not be exact.
18. Based on data provided by SIPRI Military Expenditure Database, Stockholm International Peace Research. Institute: http://www.sipri.org/databases/milex
19. Chinese 2010 Defense White Paper, http://www.china.org.cn/government/whitepaper/node_7114675.htm , accessed on 20-Jan-2012
20. The Military Balance 2011, Asia, p - 199
21. 'Military Balance 2011' (London: Routledge, 2011)
22. Based primarily on content taken from 'Military Balance 2011' (London: Routledge, 2011). Figures are approximate
23. Jane's Armour and Artillery 2010-2011, CHINA, p - 4
24. ZTZ99 Main Battle Tank, http://www.sinodefence.com/army/tank/type99.asp , accessed on 19-Jan-2012
25. Ibid
26. Jane's Armour and Artillery 2011-2012, China/MBT's, p 11-14
27. Chinese Military Might on Display, http://www.iiss.org/publications/strategic-comments/past-issues/volume-15-2009/volume-15-issue-8/chinas-military-might-on-display/ , Volume 15, Issue 8 – October 2009, accessed on 25-Jan-2012
28. Jane's Armour and Artillery 2011-2012, China, p 310 - 311
29. Ibid
30. Based primarily on content taken from 'Military Balance 2011' (London: Routledge, 2011). Figures are approximate.
31. Based primarily on material in International Institute for Strategic Studies, The Military Balance 2011 (London: Routledge, 2011). Figures do not include equipment used for training purposes. Some equipment figures are estimates. All equipment figures represent equipment in active service.
32. Jane's Armour and Artillery 2011-2012, China, Self-Propelled Guns & Howitzers (Tracked), p – 795 - 800
33. Ibid.
34. Ibid, p - 796
35. Ibid, p - 798
36. Ibid, p - 799
37. Jane's Armour and Artillery 2011-2012, China, Towed Anti-Tank Guns, Guns & Howitzers, p –

931 - 940
38. Ibid
39. Jane's Armour and Artillery 2011-2012, China, Multiple Rocket Launchers, p – 1030 - 1052
40. Ibid
41. China's missiles – The Economist, 06-Dec-2010, http://www.economist.com/blogs/dailychart/2010/12/chinese_missile_ranges, accessed on 17-Jan-2012
42. Jane's Strategic Weapon Systems, Issue Fifty Five, Offensive Weapons, China, p - 33
43. The Military Balance 2011, Asia, China, p - 230
44. Jane's Strategic Weapon Systems, Issue Fifty-five, China, Offensive Weapons, p - 34
45. The Economist online, Dec 6th 2010, 13:46 http://www.economist.com/blogs/dailychart/2010/12/chinese_missile_ranges, accessed on 12-Feb-2012
46. Richard A. Bitzinger, S. Rajaratnam School of International Studies Singapore, The China Syndrome: Chinese Military Modernization and the Rearming of Southeast Asia, http://www.rsis.edu.sg/publications/WorkingPapers/WP126.pdf , p - 3
47. Jane's Sentinel Security Assessment, China and Northeast Asia, Air Force, 7 November 2005, p. 8.
48. Military Balance 2011, p - 231 (London: Routledge, 2011). Figures might not be exact
49. Dennis J. Blasko, 'The Chinese Arms Today, tradition and transformation for the 21st century', Routledge 2006, p - 135
50. Jane's Land-Based Air Defence 2011-2012, China, Self-Propelled Anti-Aircraft Guns/Surface-to-Air Missiles Systems, pg - 109
51. Jane's Land-Based Air Defence: 2011-2012, Towed Anti-Aircraft Guns, China, p - 290
52. Ibid
53. Ibid, p - 290
54. Jane's Land-Based Air Defence 2011-2012, China, Self-Propelled Anti-Aircraft Guns/Surface to Air Missile Systems, p - 110
55. Ibid
56. Jane's Land-Based Air Defence 2011-2012, China, Self-Propelled Anti-Aircraft Guns/Surface-to-Air Missiles Systems, pg - 109
57. Chinese Military Might on Display, http://www.iiss.org/publications/strategic-comments/past-issues/volume-15-2009/volume-15-issue-8/chinas-military-might-on-display/ , Volume 15, Issue 8 – October 2009, accessed on 25-Jan-2012
58. Jane's Land Based Air Defence 2011-2012, Inventory, China, p - 518
59. Jane's Land-Based Air Defence 2011-2012, China, Shelter and Container based Surface to Air Missile System, p - 458
60. Jane's Land Based Air Defence 2011-2012, China, Static and Towed Surface to Air Missile Systems, p – 365-372
61. Jane's Land-Based Air Defence 2011-2012, China, Self-Propelled Surface-to-Air Missiles, p - 137
62. The Chinese Effect, http://www.friendsoftibet.org/main/eco.html, accessed on 20-Mar-2012
63. Military Balance 2011, (London: Routledge, 2011). Figures might not be exact
64. The Military Balance in Asia: 1990 – 2011, A Quantitative Analysis, Centre for Strategic and International Studies, http://csis.org/files/publication/110516_South_Asia-

AsiaMilitaryBalance2011.pdf , accessed on 26-Jan-2012
65. Anti-Tank Guided Missiles, Chinese ATGM, http://www.pmulcahy.com/PDFs/heavy_weapons/atgms.pdf , accessed on 27-Jan-2012
66. Jane's Infantry Weapons 2010 – 2011, Anti-Tank Weapons, China, p - 400
67. Jane's Infantry Weapons 2010 – 2011, Cannon – China, p - 437
68. 'A railway will be connecting Lhasa and Nyingchi', http://www.tibettravel.org/tibettravel/Html/201041411831-1.html, accessed on 17-Mar-2012
69. The Chinese Effect, http://www.friendsoftibet.org/main/eco.html, accessed on 20-Mar-2012
70. Chinese Ministry of National Defense, http://z9.invisionfree.com/21c/ar/t10025.htm, accessed on 20-Mar-2012
71. Ian Easton, The Assassin Under the Radar, http://project2049.net/documents/assassin_under_radar_china_cruise_missile.pdf , accessed on 02-Feb-2012
72. China's National Defense in 2010, http://www.china.org.cn/government/whitepaper/node_7114675.htm , accessed on 22-Jan-2012
73. Ibid