

Defence Production and Defence Production Policies of India and China Post 1950

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Abstract: *After a neck to neck race in military hardware imports till 1990, India & China have tried to reverse the trend. However performance of Chinese defence production has been remarkably better than India. India set aside 1.65% of its GDP on defence touching. Rs. 2, 49,099 crore (USD 52.2 Billion) in 2016-17. Out of total outlay, Rs. 86,340 crore have been set aside as capital expenditure which includes procurement, upgrading and modernization of equipment. India currently procures approximately 70% of its equipment needs from abroad for its armed forces. India is slowly becoming the world's largest defense equipment importer (buying 12% of total global exports during 2008-12) which has led the government to evolve different ways to expand procurement from indigenous sources to 70% from the current 30%. People's Republic of China (PRC) on the other hand which imported 25% more than India from 2003-2007 reduced its imports to 50% than that of India during 2008-2012. Moreover Chinese defense equipment exports crossed \$14.0 billion as compared to India which was paltry USD 0.5 billion from 2011-14. Significant progress made by Chinese defence production industry vis a vis Indian counterpart is a subject of great interest and needs to be investigated. Policy reforms and grand strategies adopted by China from time to time have gone a long way in the success of Chinese defence production. Chinese success story offers numerous lessons for Indian policy makers more so in programmes like 'Make in India'. Energizing Defence Research and Development Organization (DRDO), DPSUs and OFs, transfer or import of technology, attracting FDI, restructuring production, easing procedures and effective networking of user organizations will help to achieve the goal of self-reliance for India.*

Keywords: *Defense Production, Make in India, regulatory regimes, FDI, Defense R&D, Defence Production Policy, Commercialization.*

I. Introduction

Indian sensitivities to its defence and security stem from its peculiar geopolitical and strategic location, internal strife and hostile neighborhood. Aggressive China and militant Pakistan remain two major factors for spurring defence and security requirements. A developing nation with the lowest per capita income (USD 1390) is constrained to allocate significant resources for maintaining territorial integrity and internal peace. India currently procures 70% (approximately) of its military equipment needs from abroad for its Army, Navy and Airforce (Satish Kulkarni, 2015). Self reliance index of India remains at a wobbly 30% despite spasmodic policy posturing to improve indigenization (Mishra, 2015). A country with limited resources spent Rs. 1.03 lakh crore from 2009-2014 on acquisitions. India is likely to spend Rs. 6.18 lakh crore (USD 130 Bn) by 2022 on buying new military equipment. Growing defense budget (5.31% year on year) and India becoming the world's largest defense equipment importer (buying 12% of total global exports during 2008-12) has led the government to evolve ways and means to expand procurement from indigenous sources to 70% from the current 30% of the total requirement. Defense equipment import constitutes 40% of total imports of India.

People Republic of China (PRC) with a whopping \$146 billion defence budget poses serious problems for India with 5% rise per year. Military imports of PRC declined to 50% than that of India during 2008-12. PRC boosted its military exports to more than USD 14.0 billion (Lokmat Times, 11 May 2015) while India stagnated at USD 0.5 billion (MoD, Annual Report) in the same period. PRC not only cut down defence imports from 12% to 6% of worldwide arms imports from 2008-12 but also attained 5th position in arms exports in the world. With a view to control defence imports and cut expenditure, Government of India (GoI) declared Defence Production Policy (DPP) 2011 as one of the measures. The defence equipment requirements are planned to be met through streamlining R&D, attracting FDI, renovating production facilities, public private partnerships and easing regulatory regime etc. Defence is also been included as one of the 25 sectors in 'Make in India' campaign. Nevertheless brilliant performance exhibited by the Chinese defence production becomes a subject of great importance for research.

Objectives of the Paper

Objectives of this paper are:

- a) Study the evolution of Chinese defence production industry and initiatives of PRC for boosting defense production subsequent to 1950.

- b) Compare the evolution of Indian Defence Production industry and policy frame work vis a vis the Chinese industry.

II. Research Methodology

The paper is based on secondary data collected from various sources like websites of ministries and departments of GoI, defence production industry, industrial organizations, print media, other websites and research articles.

Evolution of Chinese Defence Production Industry post Independence to 1970

In 1949, defence production industry of PRC was suffering on many accounts. PRC and Soviet Union had an old defence alliance and USSR gave significant assistance to PRC in production processes and in organizing production even after 1949. Due to Soviet Union's much broader industrial, scientific and technical base since 1920s, it performed much better in defence production. Secondly China did not do as well because till the end of World War II it was dependent on the U. S. for military equipment and some funding was also available to China to counter Japanese influence. Thirdly Mao's concept of people's war did not support the requirement of heavy defence industry and was responsible for the decline of defence industry. In 1949, China had 45 defence production industries employing about 1 lakh people. High corruption, cost, inefficiency, duplication of effort and low quality were rampant. This was partly due to the fact the state issued the projects, allocated materials of production, bought products and assumed sole responsibility for profit and losses. With government being the only buyer (monophony), the military enterprises could hardly be productive and profitable though economies of scale were available. Without any responsibility for profit, they made the defense industry least progressive. China had a large number of structural, organisational and cultural deficiencies that impeded design, R & D and manufacturing of advanced arms. Defense enterprises were targeting only military products and were lacking power. Failure of Chinese defense industry was also attributed to compartmentalized and vertically integrated defense industrial base which restricted diffusion of advance civilian technology to defense sector and resulted into limited communication between R & D, factories and the consumer i.e. People Liberation Army (PLA). It increased redundancy and duplication of effort within arms industry as each enterprise tried to do it all. Since there was no profit motive, the production for export was not allotted resources and/or efforts. Defense R & D and production was characterized by modest technological objectives. The focus was on quantity and not on quality. Seventy percent of Chinese state run factories were biggest loss makers and burdened state run banks. Fifty five percent defense industries were located in 3rd line, yet most of them were less productive than coastal units. Chinese Defense Industry complex worked under a centre which was highly centralized, hierarchical bureaucratic and risk averse. This stymied innovation, retarded R & D and added to programme delays. Production management was highly centralized and personality centric (Richard A Bitziner et. al., 2004 and Evan S. Medeiros et. al., 2005). PLA favored imported weapons over locally made ones. K class submarines, air to air missiles (AAMs), Airborne Warning and Control System (AWACS) and transport aircrafts had made China one of the largest arms importers. Defence related R & D in China did benefit from foreign input including technology transfer from USSR in 1950's but without inculcating long term agreements or collaborations. Political movements and developments from 1958 to 1962 and 1966 to 1976 devastated China's cadre of designers and technicians of military industry (Evan S. Medeiros, 2004). In 1952, less than 1/2 of 1 percent of adult population had a degree of higher education. Even after 1960, China continued to import technology but it was restricted to reverse engineering either by straightway copying or derivations of technical insights.

Developments from 1970 to 1990

The era of 70s saw a significant decline in inflow of technology capital and know-how to China. Emphasis was on diversification of defence production industry to production of civilian goods. Due to combined effect of four modernizations of Deng Xioping, arms control and non proliferation commitments, PRC imports declined against rising requirement of military hardware.

During this period, equipment which Chinese industry produced was unimpressive and it was reflected in technological backwardness of systems. Long R&D and production time lines and China's growing reliance on purchases of major weapon systems from abroad continued. R&D was carried out at organizationally separate institutes from the manufacturing. R&D institutes did not get information from manufactures. Institutes were funded through annually budgetary allocations from central government and received minimal input from production enterprises. Excessive production capacities, redundant personnel, inflexibility in hiring and firing, loss of quality personnel to private enterprises were a few other problems. Lack of incentives for efficiency and innovation (manufacturer was paid cost plus 5 percent incentives), ministerial bargaining in placing orders without competitive bids and no interest in improving quality. Improvements in time lines had no effect on

future orders. Relocation of defense industry units to third line (interior provinces) further increased the redundancy and inefficiency in Chinese Defense Industry complex (Evan S. Medeiros et. al, 2014).

After the mid 80s, China started to purchase technology selectively. However, the overall pace of development remained slow. For example in 1960, China produced J-6 fighter based on 1950 vintage MIG – 21. In two decades, i.e. by 1980, China advanced only to J-7 based on MIG 19 which was still based on design of 1950. By 1980s it started becoming evident that China cannot answer challenges thrown by modern conflicts as concept of people's had lost its viability. Due to the western arms embargo between the early 1950 and 1980, China attached a lot of importance to self reliance (*'zili-genesheng'*) and 'walking on two legs' (creating own capabilities) which was seen as indispensable part in Chinese security (Richard A Bitzinger et. al., 2004). It needed reorganization of Institutes for shuffling organizational responsibilities and implementation of measures needed to enhance efficiency and boost innovation. China reorganized existing (as in 1978) multi controlled/owned 8 Machine Building Industries (MBIs) and 2 ministries to five ministries and corporations under State Commission of Science Technology and Industry for National Defence (COSTIND) which was established in 1982. Aim was to reduce reliance on government support, and spur dynamism and innovation. When ministries were converted to cooperations, ministers were renamed as general managers. Thereafter, three revolutionary steps were implemented in Chinese Defense Industry after 3rd plenary session of 13th Central Committee (Sept 1988) which included restructuring, shifting military technologies to commercial uses and exports of commercial products. Despite this, China by late 1990, continued to possess one of the most technologically backward defense industries. It was 15-20 years behind west in technology especially in aeronautics, propulsion, microelectronics, computers, sensors, seekers, electronic warfare, advanced materials and system integration. Again it was realised that commercialization and exports would serve economic, strategic and political interests. Therefore Chinese defence industry firms diversified away from military production to producing civilian goods for domestic and international markets reducing defence industry's reliance on government support.

Chinese Defense Industry base was decentralized with increasing scope for local state owned enterprises (SOEs) and privately owned enterprises (POEs) to contribute to R & D and production. China realized that their defense, economic and administrative system needed to get in to the right path of socialist market economy. Therefore many new initiatives with respect to creating responsibility and accountability, R&D and technology upgradation were implemented. Since import of technology assumed more importance, advance technology was imported, evaluated, digested and assimilated for redesign as per state needs. Military enterprises were modified from production alone to develop new products, technology training, market forecasting and repair services. Alongwith its efforts to achieve technological breakthrough, China continued to rely heavily on direct foreign technological inputs in critical areas e.g. J-10 is based on abandoned Israel's Lavi fight-jet programme. China acquired British Spay engines in order to advance their JH-7 fighter bomber programme. Later J-10 was fitted with a Russian engine. For Song class submarines, Chinese used German engines and French SONAR and Combat system. They also acquired Ukrainian Gas Turbine Engines, French ATS, Italian torpedoes and Russian naval helicopters.

Weaknesses in Reforms Carried Out from 1980-1990s.

Despite commercialization, there was low attraction for foreign partners in technology area. Defence enterprises had no flexibility for absorbing technology, management practices, develop new skills and labour force. Since they were to remain capable of military production, they could not become technology giants. Technology backwardness, historically long R&D and production time, more reliance on imports, lack of incentives (5% profit), ministerial bargaining and central control of technology development were major problems.

Hierarchy, which was still prevailing, discouraged horizontal flow of information exacerbated by extreme secrecy. R&D was separate from manufacturing. Procurement was still decided by admin fiat/ministerial bargaining and not on competitive bids. There was very little relation between quality produced and order received/profit generation.

Redundant personnel, inflexible hiring and firing, loss of quality manpower to non state owners, incorrectly priced inputs, poor management practices and incorrect geographic location (Third line) increased redundancy and inefficiency in defence industry. Defense conversion (*'Junzhuanmin'*) was a troubled process. Because of low quality, it neither led to production/sale/profit nor production of quality military goods. Defence conversion had at best, mixed success in China.

Policy Reforms 1998 Onwards

In 1998, Jiang Zenin called for PLA to break all ties with all business enterprises. Hereafter, Chinese industry made remarkable progress from late 1990s. Government adopted four reforms beginning in spring 1998 during 9th meeting of National People's Congress as given in succeeding paras.

Firstly, Chinese government devoted more funds to weapon acquisition. From 1990-2003 the official defense budget allocation for weapons equipment (*Zhuagbei*) grew from 5 billion RMB to 64.8 RMB. Share of budget devoted to equipment increased from 16.3 to 34 percent during (1990-2003). This increase likely contributed to the pace at which new systems were inducted. But such measures would have limited benefits unless own capabilities were developed in R&D, design and production.

Secondly, defense enterprise had matured and commercialized gradually as China's economy had grown and modernized and provided spinoff and related benefits of providing international linkages, improved R&D and production capabilities.

Thirdly, Chinese defense industry benefitted in weapon technology and technical expertise from foreign vendors like Israel and Russia. This access provided opportunities for copy production and improvement in design & production capabilities.

Fourthly, organizational and policy reforms in defense industry created incentives for managers to enhance efficiency and improve their R&D & production capabilities and new measures for defense procurement riding corruption and inefficiency. China grew a pool of talent and efforts to reform both institutional framework and incentives under which defence industry operated. It was realised that problem of 'short arms and slow legs' can be overcome by R&D institutes and factories. Most important factor responsible for the extent to which the defense industry benefitted was a result of growing defense procurement, increased attention by PLA and genuine reform of defense enterprise operations. It was realised that breaking defense industry corporation in to semi autonomous enterprise able to participate in open bidding and taking tough line on cost overruns will lead to improvement in quality and innovation. By 1998, military influenced COSTIND was abolished and a new organization, General Armament Department (GAD) (*Zong Zhuangbai Bu*), was created which was strictly a civilian agency which took over the function of weapon procurement of COSTIND. GAD was under state control and had a new role in R&D wherein military was also involved. Chinese defense industry which filed 313 patents in 1998 went up to 11,000 and later 15,000 in 2008 and 2010 respectively (Ajay Shukla, 2015). COSTIND which reported both to government and military and was involved in decision on R&D and purchases now become regulatory and administrating agency only.

3 Step Grand Strategy of Beijing

Beijing's overall grand strategy for improving the technological capabilities of China had 3 broad elements namely i) selective modernization, ii) civil military integration in the form of revolution of military affairs (RMA) and iii) acquisition of equipment and technology which could be through purchase or by hook or crook i.e. reverse engineering, cloning or copying (Ajay Shukla, 2011).

Results of Reforms

China faced serious arms import restrictions till the visit of President Nixon in 1972 which were relaxed after Soviet intervention in Afghanistan in 1979 but later again imposed after Tienamin square incident in 1989. Despite all this, China developed military technologies based on imported components/subcomponents. Since 1990, acceleration in PLA's modernization benefitted enormously from procurement off the shelf. This was backed by considerable domestic R&D efforts (Olives Brauner et. al, 2015). China has integrated ToT from abroad as well as unauthorized reverse engineering of foreign weaponry. Chinese defense industry benefitted from influx of civilian technologies and foreign investment in China. Western companies are increasingly willing to transfer advance technologies to China in order to do business with it. Civilian technologies are used in Chinese defence avionics and in non lethal areas like Command and Control (C&C), Command, Surveillance and Recce (CSR) and Command, Control, Computers, Surveillance and Recce (C3SR) systems. China has adopted the approach of acquiring dual use technologies and focus on technology cooperation. As a result of these reforms, China reduced imports of defence equipment by 50 percent and dropped to 2nd position in the import of arms from abroad and became the fifth largest exporter of military wares. In addition it has developed its own military capabilities by PLA (Navy). Domination of South China Sea has triggered an Arms Race in Asia Pacific where defence spending will touch USD 533 billion by 2020 at a unprecedented 23 percent growth (ToI, 03June 2016).

III. Indian Defense Production Industry

Background: India imports 70 percent of its defense equipment requirements and 30% in-house production industry is dominated by 9 Defense Public Sector Undertakings (DPSUs) and 41 Ordnance Factors (OFs) both employing 2.035 lakh people. DPSUs and OFs contribute about 90% of the total domestic manufacturing output. Twenty five to thirty percent productions is outsourced to private companies. About 6000 SMEs are dependent on DPSUs. The OFs and DPSUs produce a wide range of equipment starting from weapons, ammunition, electrical and electronic equipment, aircrafts, ships, vehicles, clothing and even food items. Indian import export ratio of defence equipment is inferior to countries with a much smaller defense industrial base.

India imported 14% of total defense equipment exported worldwide during 2009-13 (SIPRI) from USA, (75%), Russia (7%) and Israel (6%) these three being the major suppliers to India (ASSOCHAM, India, 2014).

Over the years India has created a vast defense industrial base yet the economic load of imports of defense equipment is very heavy. Similarly, the OFBs, DPSUs in India have not been able to deliver and fulfill the requirement of Indian armed forces. Our present day situation is similar to the one which existed in China from 1950-1990. Technological backwardness, reliance on imported technology, weapon programmes and project delays which were rampant in China are ailing Indian defense production industry even today. MBT Arjun project which was started in 1970 saw its first trials in 1992-93 (after 22 years). 124 pieces of Arjun Mark I have been delivered to Army which are dogged by technical problems. IAF is not satisfied with Tejas LCA Mark I which has just become operational after two decades. Army does not want more Akash (SAM) Regiments after its order of Rs. 14,180 crore due to its stabilization, 360° coverage and reaction time problems. Navy is planning to procure similar equipment from France (ToI, 2016). Similarly Astra (Air to Air) and Nag Anti Task Guided Missile (ATGM) have been delayed by more than 20 years. There has been very little progress in the production of field howitzers/guns, night vision devices, attack hepters, long range submarine launched missiles, Airborne Warning and Control Systems (AWACS), Unarmed Aerial Vehicles (UAVs) and Autonomous Unmanned Research Aircrafts (AURA). Poor quality of research and development and inordinate delay in completion of defense production projects is largely attributed to poor work culture, less defense spending on R & D, dearth of scientists more so of quality scientists, ever increasing expectations and trust deficit with service HQs (Srinivas Bhogle, 2012).

Defense production needs long term and large investments, cutting edge technology with low economics of scale. The industry is peculiar as it is a monopoly in which the only market creator is the government. Similarly, this industry has to cater for unusual wastage rates during the war which has very limited predictability in terms of time and volumes. Export market and collaborative arrangements/partnerships are subjected to strict government approvals. Since there is fierce a race among various countries to achieve qualitative edge over the defense equipment of the other countries, rate of evolution of defense technology and consequent obsolescence are very fast. This necessitates strong R&D organizations to evolve new technologies and field new equipment. Defense Research and Development Organization (DRDO) is the prime organization for research in defense technologies in India. DRDO is more or less like pre 1982 COSTIND which was a failure and was reorganised. Interests of DPSUs, OFBs (SoEs) are kept above the openly bidding companies and competition does not emerge though it has been claimed that after implementation of Defence Procurement Policy (DPrP) 2013, level playing field with private sector has been created (Mishra, 2015).

Indian defense production is suffering from the same problems as PRC suffered pre 1998 (Ajay Shukla, 2011). A comparison of turnover vis a vis employment between the Indian DPSUs & OFs and some of the global defense production companies is given in Table I and II which further illustrates the weaknesses in productivity of the Indian DPSUs and OFs.

Table I: Turnover and Employment of Topmost Defence Industries in the World

Company	Annual Turnover (\$ Bn)	Profit (\$ Bn)	Employment (lakh)	Foreign Mil. Sales
1. USA 2014 (Share of World Exports – 30%) *				
Lockheed Martin	45.600	5.5	1.12	4.32%
Northrop Grummann Coop.	24.661	1.95	0.643	2.44%
Boeing	90.78	5.446	1.627	0.97%
2. Israel \$				
IMI	3.5	-	0.5	2.4
3. France #				
a) Dassault Aviation,	3.5	-	0.11	
b) DCNs,	3.4		0.13	
c) EADS,	61.0		-	
d) MBDA,	3.1		0.10	
e) SAFRAN	5.4		0.12	
	Total = 76.4		Total = 0.46	
4. Russia **				
Almaz-Antey, Armoured	13.5	-	--	
5. China \$\$				
a. Chinese AST Corporation	47.0	-	1.70	14
b. China's ASI Corporation	25.5	-	1.35	
	Total = 72.5		Total = 3.05	

Kumar Pardeep – Defence Production Industry India and China-Lessons for ‘Make in India’ National Conference Proceedings, Make in India – The Road Ahead, MGM Institute of Management, Aurangabad (M.S.) In comparison to the above, the performance of Indian DPSUs and OFs is given in Table II

Table II: Value of Sales of Indian Defense PSUs and OFs and their Profits

Entity	Value of Sales (Rs. Crore)			Average in USD Bn	Emp (Lakh)	Export Rs. Cr. 2906 * (USD 0.50 Bn) in 11-14
	11-12	12-13	13-14			
DPSUs (9)	41058	41440	41404	6.6	1.1	
OFs (39+2)	12390	11984	11234	1.8	0.935	
Total	53448	53424	52638	8.4		
Profit	4329	4842	4299	0.71		
Profit \$ Bn	0.66	0.74	0.66			

Source—Defense Public Sector Undertakings at [http://ddpmod.gov.in/printcort.php?lid=43 &lang=1 &level=0&linkid=31](http://ddpmod.gov.in/printcort.php?lid=43&lang=1&level=0&linkid=31)

Indian domestic defense production is about USD 8.4 Bn per year and the DPSUs and OFs register approximately USD 0.68 bn as profit per year.

IV. Research and Development for Indian Defence Production

Indian ambitions for defense production do not match with R & D capabilities and strength. India spent only 6% of its defense budget (0.90 percent of GDP) on R & D in comparison with 12 and 20 percent spent by the U. S. (2.66% of GDP) and China respectively. Private sector such as TATA, L&T and M&M invest less than one percent of their turnover on R&D unlike in countries like France where corporate organizations invest more than 10 percent (Mishra, 2015). If R&D is not boosted significantly, self reliance for India will be elusive (Laxman Kumar Behera, 2011).

Initiatives after 2011.

In order to give a boost to indigenous defence production, GoI declared Defence Production Policy DPP-2011 on 1 Jan 2011. The main objectives of the policy are a) to create self-reliance in designing, b) improving development and production, c) to create conducive environment for private participation and d) to broaden R & D base while maintaining an edge on adversaries in defense preparedness (DPP, 2011). Preference is to be given to Buy (Indian), Buy and Make (Indian) and make categories for acquisition over Buy (Global) category.

Under the DPP, preference is to be given to indigenous designs, development and manufacturing while adhering to time limits. As per Long Term Integrated Perspective Plan (LTIPP), equipment which will be required after 10 years or more will be made in the country. Systems/equipment which cannot be developed/integrated or made as per time line, can be imported. Establishment of a robust indigenous defense industrial base by involving private sector will be a priority and competitiveness of Indian industry would be maintained. R & D will be encouraged by forming consortia, joint ventures, PPP and involving academia, scientific organisations of repute and R & D institutes and by strengthening R & D wings of OFBs & DPSUs. Service HQs (SHQs) (Army, Navy, Airforce) will keep the general service requirements practical yet competitive with that of potential adversaries. Buy option will be followed by indigenization. DRDO, Department of Defence Production (DDP), HQ Integrated Defence Staff, (HQIDS) & SHQs will be involved in identification, evaluation and absorption of required technology. Upgrades will be carried out by Indian industries in close coordination with private sector. Reviews by Raksha Mantri will be carried out annually. The four page document of DPP has left many issues unaddressed and a few of them are as under:-

1. The DPP-2011 is silent on how to get investment in R&D and it does not give any roadmap or directions to encourage R&D. Technology perspective and capability roadmap for 15 years is not yet available. Similarly Kelkar Committee recommendation of creating funds for SMEs for technology development has not been implemented.
2. DPP-2011 lacks emphasis on exports abinitio.
3. The policy is silent on use of military technology for commercial (civil) use. LTIPP has also not been made public. The industry cannot plan for what will be required 10 years later.
4. There are ambiguities about entry of PSUs in defence production. Giving production to private sector is considered risky.
5. OFB is being patronized for producing new systems despite their limitations of quality and meeting general service requirements laid down by SHQs.
6. Licensing, FDI and tax related issues are still there. China and Korea have done well due to extremely liberal policies of FDI (Mishra, 2015) but the FDI cap of 49 percent has been kept in India.
7. Many delays and cancellations in defence procurement due to offset clause have taken place. Contracts of mid air refueller and M-777 howitzers have faced delays due to offset clause. Many foreign companies have been fined (total fine USD 35 million) due to offset violations. Offset policy needs drastic changes (P. D. Samanta, 2015). Moreover foreign firms have barely meet 50 percent offset obligations of USD 1.3 Bn

from 2008 – 14. Offset policy guidelines (2012) have allowed ToT through JV or through non equity route. It has allowed multiplier for critical technology areas such as FPAs, Nano technology based sensors, fibre and laser technology etc.

A comparison between Chinese defence production policies (1988) with those of India reveals the success factors of China and weaknesses of Indian policies. A comparison of the major policies of China and India is given in Table III below:

Table III: Comparison of Important Points of Chinese & Indian Defense Production Policies

Indian DPP 2011	China (3 rd Plenary Session of 13 th Central Committee 26 – 30 Sep 88)
49% FDI is allowed in automatic route and more on case to case basis. Beyond 49% approval of cabinet committee on security required. Offsets requirement of minimum 30% in case of imports in excess of Rs. 3 billion	No mention of limit on FDI No mention of 'Offset' clause
Emphasis on Self reliance in design/development & production	Emphasizes acquisitions, restructuring and reducing number of hierarchical levels.
To broaden defense R & D base of the country.	Import technology selectively on requirement basis alongwith stress on R&D.
Consider capability of R&D while making GSQR. Synergy between Academia of R&D promoting research.	Reverse engineering, stealing and cloning is acceptable (Ajay Shukla, 2011).
Creating conditions for private partnership	Shifting military technologies to commercial use
To enhance potential of SMEs in indigenization. Classical use of buy and make policy.	Export of commercial products

V. Recommendations

Chinese success came from reorganization/restructuring of existing defence production and by enhancing R&D by investment, import of technology with equipment and reverse engineering. India can adopt this model as well. Following recommendations are made:

1. DIPP suggestion to increase FDI to 74 percent in defence is progressive. Security considerations, increased dependency and wrong use of exported equipment should not deter India from 100 percent FDI.
2. Enhancing ease of doing business in India and lowering cost of capital for defence production will definitely attract collaborations and help to meet objectives.
3. R&D. Government should support private sector from R&D perspective so that reliance on foreign countries is reduced. Government should assist in developing design and manufacturing capabilities of private sector. Presently expenditure on R&D by private sectors is very low. Projects on ToT basis are required to be encouraged. Joint R&D projects with developed countries must be undertaken with transfer of technology and equipment import. DRDO and private sector must collaborate for R&D as was done in case of DARPA in the U. S. It can be done against long term orders. R&D cannot be kept separate from manufacturing. DRDO must be dovetailed and collocated with DPSUs and OFBs as done by China. There two entities must work together and in consonance with service HQs (users) by incorporating their representatives from inception stages. Project delays must be removed.
4. DRDO should concentrate on 8-10 critical technologies as was done by China (also recommended in Rama Rao Committee report). Create pockets of excellence as China did in missiles, aircrafts manufacturing, multi satellite launch/retrieval and cyber warfare. DRDO should focus on critical technologies like Gas Turbine Engine, aeronautics, super cavitating technology, nano material, carbon fiber, sensors, avionics, surveillance, Focal Plane Array (FPA), Active Electronically Scanned Array (AESA) and stealth technology.
5. Government should provide incentives for R&D through PPP mode by investing in technology intensive high risk defence industry. Funding of R&D by low interest rates, addressing exchange rate fluctuations, providing stable policies and encourage exports thereby achieving economies of scale.
6. It must be mentioned that indigenization has effected a substantial reduction in cost of systems due to India's labour arbitrage, good facilities and fairly well trained labour force (Mishra, 2015). Therefore enhancing the efficiency of OFs and DPSUs by incentives, automation, autonomisation and competitive bidding is essential. Open bidding system and creating a level playing field for private sector will help to improve DPSUs and OFs as it happened in China.
7. The OFB, DPSUs and DRDO need to be made more accountable and self sustaining on the lines of Chinese defence industry reorganization. Constitution of defence technology committee and commercial arm of the DRDO would help in this direction.
8. Developing strong supply chain linkages by involving MSMEs is essential and in green field areas increased outsourcing to MSMEs will help. MSMEs don't take risk due to long gestation periods for production, uncertainty in orders and heavy investment. MSMEs are bereft of skill levels, economies of

scale and capital. So let the production be with DPSUs but R&D can be combined in PPP mode. MSMEs need to be properly skilled, trained and networked.

9. Reducing defence import by 25 percent will create approximately 1.2 lakh jobs in India. Skill requirements have to be met to fasten technology absorption which will automatically lower dependence foreign collaborators.
10. Offset clause is required to be reframed. OEMs are finding it difficult to meet offset obligations. Offset approval committee is required to be set up with DEA, DIPP, DGFT and DRDO on the lines of FIPB.

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