ARMS TRADE WITHIN THE THIRD WORLD : ITS IMPLICATIONS

DISSERTATION SUBMITTED TO THE JAWAHARLAL NEHRU UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PHILOSOPHY

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1986

ACKNOWDEDGEMENT

I would like to thank foremost, my Supervisor, Professor T.T. Poulose, whose constant encouragement, inspiration and advice helped me to finish this dissertation.

No words are enough to express my gratefulness to my parents who only heard about my writing this dissertation in faraway Kabul one year ago. But today they are here in India, and it is to them that I owe much more than I can ever repay. Their quiet confidence and t rust in me helped me sustain the agony of not seeing them and still completing my work.

I would also like to thank my numerous friends who have helped me through my trying periods. I would like to thank in particular Anand, Aabha, Anuradha, Aswini, Biraj, Padma and Stoppie. Special mention must be made of Air Commodore Jasjit Singh, Deputy Director of the Institute for Defence Studies and Analyses, who not only gave me useful tips on how to approach the subject but also provided me with valuable books and articles. I would also like to thank the staff of IDSA and JNU libraries for their help in locating material.

Finally, a special thanks to Mr Shiv Sharma for typing the entire manuscript in a flawless manner.

Fahima Assifi

9 July 1986
New Delhi

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INTRODUCTION

Chapter I

INTRODUCTION

The end of World War II saw the destruction of Europe on a scale never before imagined. It also witnessed the emergence of the United States as the most powerful nation in the world. The destruction of Europe did not see a move towards disarmament, rather it saw a spurt in military activities that have absorbed resources on a scale that has no precedent in modern history. In 1984 the resources absorbed by the arms race were valued at $ 970 billion. Arms exports as a whole has become a very lucrative business amounting to almost $1743 billion, in the year 1983 (in constant 1982 prices). Of this huge volume of export turnover the Third World's share was paltry 11 per cent amounting to $477 billion. Since 1970 the quantum of arms sales by Third World countries has, however, shown a continuous upward trend which in the years to come is going to assume significant proportions.

Consequently, there has been an expansion of arms production in the Third World countries from $2.3 million (in 1975 constant prices) in 1950 to around $1200 million (in 1975 constant prices) in 1984. In 1984 the total value of arms production was 500 times larger than 1950.

It is this disturbing and important phenomenon that has been chosen as the main focus of this study. Armaments have their impact on relations between the rich and the poor,

between regional and sub-regional dominant states. They affect issues of development and dependency. Arms production has economic, political, and military/strategic implications which affect international relations as a whole.

Since 1950, major Third World countries like Brazil, Argentina, India, China and Israel have actively sought to enter the arms bazaar for a variety of reasons. Each one of these countries perceived the need to completely indigenize arms production and to export for reasons peculiar to their geographical locations, strategic relationships, historical enmities, and the very ethos of their nationhood. These major countries have, between the period 1950-84, accounted for almost 80 per cent of Third World arms production.[1] In the same period 54 countries have been engaged in production, of this total 42 countries produced ammunition, 27 small arms, 16 aircraft, 11 armoured vehicles, 8 missiles, and 33 ships.[2]

With this impressive growth of Third World arms production, certain questions crop up inevitably. First is the concern of world-wide diffusion of power in the international system and the effect of this distribution caused by

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1 Michael Brzoska and T. Ohlson, Arms Production in the Third World (London, 1986), p.10.

2 Ibid., p.16.

Third World arms production. Secondly, the nature of the relationship between the suppliers and recipients of military technology has to be examined. Thirdly, economic dimensions of arms production by the Third World are very important. Fourthly, the technological sophistication and complexity of arms production and its impact on the countries on the path of industrialisation cannot be ignored. Fifthly, the economic arguments for and against arms production and the various problems that are faced in arms production require serious analysis. Sixthly, the increase in exports and its impact on stability internationally, regionally and sub-regionally need to be studied. And finally, the ability of the Third World countries to overcome dependency on traditional suppliers for technology, raw materials and strategic alloys cannot be overlooked. These are the major questions that this study would try to analyse.

It has been observed that even half of the Third World arms production is in the nature of licenced production which means that dependency patterns on traditional suppliers have taken a new form. Arms production which began from 1930s onwards further propelled itself after 1950, when efforts were made for import substitution and self-reliance. These efforts were not successful as World War II had generated rapid developments in military technology in the industrialized

countries and this technological gap between them and Third World countries is firmly established. In the 1960s arms production in the Third World, though technologically of vintage quality, regained momentum and the decade saw a five fold increase in the value of arms produced and a ten fold increase in the number of countries joining the long list of arms producers.

As more and more countries joined the ranks, the decade 1970 to 1980 saw an almost continuous increase in all spheres of licenced and indigenous production. The early 1980s have seen a slump in Third World arms production due to certain causes including the global economic crisis which limited procurement budgets in most countries. Second, the technologies involved in the manufacture of armaments in Third World countries reached a saturation point. On the other hand, arms exports in the corresponding period have shown a steady increase. Brazil, Israel, Egypt, Argentina have all exported over 70 per cent of their total arms in the short period between 1980 and 1984.[3] The technological levels of arms production have diversified from ships and aircraft in the period 1950 to 1984 to an almost even share of aircraft, ships, armoured vehicles and missiles during the period 1980 to 1984. It shows that with the advancement of

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3 Ibid., p.34.

armament industries in developing countries, the technological capabilities to absorb relatively sophisticated technologies are significant. Another factor is the change in the pattern of ownership of major corporations/government bodies that is taking place. In the period 1950 to 1965 a majority of the countries relied on government agencies for arms production as it involved greater capital investment, use of the available skilled manpower in concentrated form and gave it a sense of urgency. All these three factors were not possible for Third World civilian industries. However, the following decades have seen a change in the patterns of ownership though in most countries government is the main promoter of armament industries. The civilian industries in many countries are taking over the role with or without collaboration, indicating a general upswing in the levels of industrialization and sophistication of the industrial base of these countries. Hence Third World countries pose serious threats to the traditional supplier's monopoly of exporting arms for economic and political reasons. This new development makes such a study imperative.

MAJOR ARMS EXPORTS OF THE THIRD WORLD: NATURE AND SCOPE

Chapter II

MAJOR ARMS EXPORTERS OF THE THIRD WORLD: NATURE AND SCOPE

This chapter deals with the nature and scope of major Third World arms producing countries and in this attempt four major countries are taken for detailed study. This has been done as Argentina, Brazil, China and India are representative of the Third World in terms of basic motives behind arms production and their exports. The levels of industrialization that these countries have acquired are among the highest in the Third World and they have shown enough skill in assimilating technology that they have acquired through licensed production. They also have shown the ability to develop armaments indigenously.

Before taking up the major countries for detailed discussion in the succeeding chapters a brief survey of the domestic arms production and export of other significant Third World countries is given below.

Egypt: The main reason for the establishment of domestic arms production in Egypt has been a political one. The basic motive was to achieve self-reliance and independence from traditional suppliers. In the recent years, Egypt has emerged as one of the major Third World arms exporters. Egypt's exports during the period 1970-76 was $4 million and by 1982

reached the staggering figure of $1 billion. A part of this significant amount has been due to the re-export of Soviet weapons that they had received during the heyday of Egypt-USSR relations.

Egypt was one of the first countries in the Third World to start technologically complex projects in the aircraft and missile sectors. However, this initial experiment was not a success, which led them to import military factories on a turnkey basis. This meant that the Egyptians were involved with supervision, installation and training of required personnel. Realising that such experiments do not reduce dependence, the Egyptians increased their quest for self-sufficiency in all sectors of the armament industry.

Over the years, Egypt has managed to manufacture a variety of weapons which include aircraft, armoured vehicles, artillery, missiles, ships, ammunition and anti-tank weapons. Egypt was the first country from the Third World to launch surface to surface missile (SSM) programme in the early 1960s. At present it is involved in the production of three guided missile systems; an improved version of the Soviet SA-7 surface to surface air missile (Sakr eye), the British swing fire anti-tank missile, and a modified version of the Soviet SA-2 (Early bird).

Armament production in Egypt dates back to the 1950s. HA-200 Saeta, basically a version of the French jet trainer was manufactured in Egypt under licence with the help of Spanish and West German technicians. Basically, the aircraft industry has not been greatly indigenised as Egypt is still dependent on foreign know-how. On the whole, arms production in this major Third World country has been slow. After the rift between the Egyptians and Soviets, the Egyptians have relied on western technology rather than developing any arms manufacture indigenously. But small arms production has expended rapidly in the period 1970-1984. Egypt has exported arms to Iraq, Oman, Somalia, Sudan, North Yemen and Zaire.

South Korea: Arms production in this East Asian peninsular country is motivated by its threat perceptions that it faces from its northern neighbour. Serious indigenous production began only in the late 1970s. Various ships of foreign and domestic design, like the US designed PS MK-5 type and CPIC type have been manufactured indigenously. The South Koreans are one of the newer entrants into the arms bazaar and have used their growing technological sophistication in the civilian industry to optimum effect in the arms industry. The ship building is one such example. South Korea also manufactures Model 500 helicopters and F5E/F fighter which are produced under licence from the United States. It also

produces armoured personnal carriers, tanks, missiles guns, ammunition and other small arms.

South Korea's military exports grew fast after their inception in 1975. From $15 million in 1975, exports have gone up to $110 million in 1977 to $250 million in 1979. There has been a concerted government supported effort to expand sales significantly, aiming at a $2 billion annual sale as a target.[1] South Korea has exported small arms and military supplies in recent years to Saudi Arabia, Burma, Bangladesh, Philippines, South Yemen, Indonesia and Cameroon. South Korea has always been on the look out for market outlets which are not dominated by major arms suppliers.

Israel: In analysing the history of the Israeli arms industry it becomes evident that certain factors like external security threat, national pride, employment potential in high technology, import substitution and export potential have played a role, but the most important reason has been the wars and embargoes that they have had to face since their emergence as a nation. Economic considerations too have played an important part in subsidizing their enormous arms expenditures.

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1 R.Halloran, "Weinberger says US will maintain curbs on Seoul's sale of arms", New York Times, 1 April 1982.

Indigenous arms industry is seen as providing Israel with basic industrial infrastructure important to both civilian and military sectors, though Israel's arms industry is closely connected with the US arms industry. All the same 96 per cent of the total production value is accounted for by indigenous production. Thirteen major firms in the Israeli arms industry employ some 60,000 people. Israel manufactures a wide range of small and big weapons systems including missiles, aircraft, tanks, anti-aircraft weapons and mortars.

The high growth rate in the early 1970s can be explained by its success in the aircraft projects (the NESHER, KFIR and ARAVA) and missile projects (Gabriel and Shafrir). Production in ships (DABUR, RESHEF CLASSES and DVORA) and armoured vehicles (the MERKAVA) in the late 1970s was very significant. Israel accounts for the highest percentage in the Third World for missile production, and basically its industry has been dominated by both aircraft and missile production.

Israeli arms exports amount to $750 million to $1 billion a year. In the early years, Burma, the Netherlands and West Germany purchased Israeli arms. In the 1960s a number of African States were recipients of Israeli arms. During the 1970s, Central and Latin Americans like Argentina, Chile, Venezuela, Gautemala, Honduras, El Salvador and Mexico became major markets for Israeli weapons. South Africa which faces

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a similar situation like Israel, is also a major recipient of Israeli arms. Iran under the Shah had expended trade in arms with Israel considerably. China of late has evinced a keen interest in Israeli arms.

Pakistan: Pakistan has been ruled for most of the time by the military and its internal politics has been influenced by the military involvements. Since independence, the sense of insecurity has been the most singular factor which has shaped Pakistan's defense and security policies. This sense of insecurity stems from the hostile relations it has with India.

Arms production, though late to take firm root, is motivated by the above factor and it has been geared towards what has been called as "basic needs - oriented self-reliant approach", meaning that infantry weapons and ammunitions have been manufactured and gradually efforts have been made to make this industry an integral part of the overall industrialization and economic development. This in Pakistan's view would enable them to achieve foreign policy goals.

Initially the arms industry went into production of small arms and some spare parts. It was only in the late 1960s that a systematic defence production programme was taken up. Many Western States and China have helped Pakistan in organizing its defence industry. Some of the major Pakistani defense establishments like the Fourteen Pakistan

Ordnance factories, the Pakistan Aeronautical Complex at Kamra which houses three major industrial projects, the Mirage Rebuild Factory, the F-6 rebuild factory and the Light Trainer Aircraft manufacturing factory are examples of Western and Chinese collaboration in the Pakistan defence industry. The Mushaak (light trainer aircraft) manufactured locally is of Swedish design. Pakistan's experience in aircraft production has been limited to assembly of Cessna Model 305 A-O-I Birddog light plane and the Alouette 3 Helicopters. Pakistan's ship building industry has been able to construct smaller ships, but is generally involved in the repair and maintainence of ships. Pakistan apart from loaning its airmen to fly the Abu Dhabi and Saudi Arabian aircraft, has been providing these countries with technical expertise and spare parts. Pakistan began exporting as a conscious policy in the early 1980s. The first two years showed a turnover in exports of $30-40 million. The Amrit Bazar Patrika, quoting State Department figures has revealed that in 1983 alone, Pakistan exported $300 million worth of military goods. This growth, according to the analysis has been sensational. In 1973 they exported goods worth only $5 million which remained more or less constant throughout the decade of the seventies. By 1982, $30 million had been exported. These sales have been made mostly to the Middle East countries and have included spare parts, various types

of ammunition, technical consultation fees, different types of personnel carriers and anti-tank missiles.[2]

Pakistan has had a major role to play in the growth of exports by developing countries which according to the same source has risen from 2 per cent of the total arms sales in 1973 to 11 per cent in 1983.[3] Thus with the implementation and completion of the projects for various aircraft and weapons, Pakistan has become a major exporter of arms in the Third World. It is an attempt not only to subsidise their own costs by competing abroad but by making inroads into the Middle East market, it is one more way of maintaining its influence with the not so stable Sheikhdoms.

Singapore: Its location at the entrance of the Malacca Straits, which is the main sea passage joining the Indian Ocean and the Pacific has made it a strategically important country.

Despite its complete dependency on raw materials and labour on external sources, the rapid development of the economy of Singapore to new heights has made it a prominent exporter in the region. Further the Government has always

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2 Amrit Bazar Patrika, 23 September 1985, quoted in Strategic Digest, New Delhi, November 1985, p.1434.

3 Ibid., p.1434.

supported the arms industry and made its development an integral part of the economic progress. The private sector, particularly the electronics, ship building and high technology fields have played a major role in the development of the defence industry. Many foreign companies, taking advantage of Singapore's easy access to cheap labour and availability of raw material (from nearby countries) have opened up production centres for military hardware. They include McDonnell-Douglas, Vosper Thornycroft, Lurssen and SIAI Marchetti. Singapore has succeeded in producing all kinds of weapon systems and ships which include TNC-45 fast attack craft, aircraft like A-4 Skyhawk fighter and Puma helicopters.

The production capacity of Singapore far exceeds its internal demand. Thus exports are considered vital for promotion of the arms industry in terms of providing high technology items, which have a rapid turn over rate. Sheng-Li Holding company which in turn is owned by the Defence Ministry is responsible for the bulk of Singapore's arms exports. Its exports consisting of spare parts, weapons and services were valued at $100-125 million in the early 1980s. Singapore has exported to Australia, New Zealand, Brunei, Oman, South Korea, Somalia, United Arab Emirates, Zimbabwe, Thailand and a number of Latin American countries.

Malaysia: Since 1977 Malaysia has undertaken the task of upgrading its armed forces in terms of both quality and quantity. However, as pointed out by Malaysian officials, in the foreseeable future, the threats to Malaysia, potential or real will be internal with external ramifications.

Arms production is limited and concentrated in the areas of ships and small arms. Though the Malaysian industrial base is not developed and the domestic requirements are small, the Government has given the local arms industry priority with the emphasis being on joint collaboration. This has led to intra ASEAN arms trade. The Malaysian ship yards have produced naval vessels which include six Jerong class patrol craft based on Lurssen design and 15PZ patrol craft survey ship, Mutiara (1900T) and RCP type landing craft.

The Government owns Syarikat Malaysia Explosive Limited with foreign collaboration which produces 9, 7.62 and 5.56 mm ammunition and assembles HK-33 and G-3 rifles. The armament industry is largely dependent on foreign expertise and imported material. An important feature of the Malaysian defence industry is the non-involvement of the military in arms production.

ARGENTINA

Argentina is one of the leading arms producers and exporters in Latin America. Argentina is a developing

country beset by many problems, though it is still rich in natural resources and has commanded as much as 3 per cent of the world's trade.[4]

Argentina has a long tradition of manufacturing arms indigenously. In fact among the Third World states it has the longest experiance in manufacturing military equipments. The Argentinian government has always believed that its survivability is quietly related to its military purchase, of arms from outside as well as drafting plans for indigenous production of armaments. Its industrial cooperation with Germany dates back to the 1890s. By the early 1920s, policies for acquisition of arms were formulated and an arms industry was started. In 1935, the first military steel plant (Fabrica Militor de Aceros) was set up and it was followed by many other arms factories. At first it focussed on light industries but subsequently, plans were drawn up for heavy industries. After the World War II, arms production was benefited to a great extent from the rapid industrial expansion and in 1940, the government set up a general Directorate of Military Manufactures or Direction de Fabricaciones Militars (DGFM). The responsibility of managing the existing arms industry facilities as well as the emerging or planned ones

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4 Jacquenlyn S. Porth, "Argentina", in J.E. Katz (ed.), Arms Production in the Developing Countries, (Massachusetts, 1984), p.953.

were given to it. Some eighty factories were set up under the auspices of DGFM within a year.

In 1944 the nascent defence industry operated on the theme of "arms made in Argentina, by Argentina". By using this theme, nationalism, industrialisation and the military were linked together in a common cause.

As Argentina remained neutral in the World War II, the US imposed an arms embargo which in effect led to the promotion of the indigenous arms production. The arms industry reached its peak in terms of activity by early 1950s. Due to the availability of cheap world War II surplus arms and a limited success in arms projects accompanied with a general change in the orientation of the economy away from State interference, there was a fall in the productivity of the arms industry in the early 1960s. Beginning in 1966, Argentine government turned to Europe for supply of arms. This "plan Europe" was intended to import weapons and also to utilize the existing arms production capacities through transfer of technology from abroad. This basically aimed at seeking agreements with those European defence firms which were ready to sign co-production or licence agreements with Argentina. Various contracts were signed with French firms for the construction of ships and tanks; with a Spanish-Swiss firm for the manufacture of machine guns, ammunition and air-to-surface missiles and with British and West German companies for work on war ships.

Again in 1976, with the coming back of the military regime, arms production activities increased sharply and military budget grew also. Between 1976, and 1983 some $10 billion were incurred for foreign procurement. The government intended in increasing investments in the State run arms industry. Strategic interests outweighed economic considerations and the military proceeded to develop an enormous military industrial complex including further development of its nuclear programme.[5]

The future of the Argentine arms industry is quite uncertain as a result of the Falklands/Malvinas war. The structure and set up of the arms industry has also been changed. More and more of civilians have been inducted, for example the Defence Minister is a civilian; similarly more military officers have been replaced by civilian technicians.

It is well known that the Argentine Army had a major role in the domestic arms production via DGFM until the end of 1983. DGFM runs fourteen military factories scattered all over the country which include arms production, communication equipment, chemicals and steel. DGFM takes pride in the general supervision of the aircraft industry managed by the Air Force and the Shipyards run by the Navy.

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5 J.Goldblat and Millan, "Militarization and Arms Control in L. America", SIPRI, World Armament & Disarmament, Year Book 1982 (London, 1982).

DGFM is reported to have provided employment to a large number of people (40,000) and another 16000 indirectly in its associated companies.

While looking into the tradition of its military R&D, one factor which emerges is the inconsistency in policy planning and its implementation. The general level of dependence on foreign technology and licence production agreement due to manifold economic and other problems have not decreased.

In 1980 Argentina devoted about $530 million to R&D as a whole. This dropped to about $350 million in 1983. The share of funds for military, scientific and technological research is unknown. The identifiable portion of R&D has varied sharply. In 1978, 17.94 per cent of total R&D officially was for the Ministry of Defence, 0.20 per cent for the Navy and 1.72 per cent for the air force. In 1983 the official share of the Ministry of Defence was 4 per cent.[6]

The Argentinian military is well aware that technological advancement can be achieved only through constant research and development or by transfer of technology from outside.

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6 V. Millan, "Argentina: Schemes for Glory" in M. Brzoska and T. Ohlson (eds.), Arms Production in the Third World (London, 1986), p.37.

Considering the above two scenarios, financial burdens would be enormous. To bring about a solid defence industrial infrastructure requires substantial financial investment. To be able to ensure good returns on these investments firstly identification of potential markets becomes essential. Taking off from this point, Argentina has sought to use various methods to generate export market for its goods.

Products

The aircraft industry is one that the Argentina government is proud of. It is an important arms production sector, from the point of view of the military technology and industry. The State-run production of military aircraft — the oldest of its kind in Latin America — has dominated the Argentine aircraft industry. It was established in Cordoba in 1927 as the central organization for aeronautical research and production. Now known as Fabrica Militar de Aviones (FMA), the facilities are run by the Argentine Air Force within the DGFM framework.[7]

FMA employs a large number of technicians and engineers, the majority of them are engaged in aircraft manufacture.

Since its inception FMA is associated with designs of 56 types of aircraft out of which 24 have actually entered production. This includes both military aircraft as well as

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7 Ibid., p.40.

the civilian types. For the production of aircraft, Argentina has entered into agreement for licence production and of course some are indigenously designed.

In 1928 licenced production at FMA began with Avro 504R Gosport Trainees (UK), followed by production of the Dewoitine D.21-C1 fighter (France) and the Bristol F.28 MK 3 observation aircraft with England again. In the pre-World War II period, it was reported to have manufactured 180 aircraft of each of these types. In 1937 FMA with the acquisition of licences went into production of 500 Focke-Wulf FW 44 J Steiglitz Primary trainers of German origin and 200 Curtos Hawk 75 of USA.

The Argentine government after the World War II (1945-55) basically aimed towards indigenous production. By the end of 1950s FMA has resumed the production of foreign aircraft among which MS-760 Paris twin — jet trainer — laison aircraft (Morane Saulnier) France) and 23 Beachcraft T-34 trainers are very important. An agreement for the production of 500 Cessna aircraft in 1964 was signed. The first round of production of Cessna (A-182) began in 1966 and all production finally came to halt in 1980 after the completion of the production of 230 aircraft for civilian purposes.

Highly ambitious, indigenous aeronautical programmes started during Peron era.

Many foreign designers of the Italian, French, and West German origins headed the production projects for the manufacture of jet fighters and transport aircraft.

The designs and plans for the first jet fighter that is IA-27 Pulqui were drafted by a French designer and was flown in many of the Third World countries. The IA-33 Pulqui-2 was designed by Dr Kurt Tank which was a swept-wing jet fighter and closely resembled an old model of Fork Wulf. The various parts and components of this particular aircraft were European. As its designer left for India in 1955, the production of this aircraft was stopped after six of them were built.

With the overthrow of Peron, the government intended to manufacture a transport and smaller aircraft. The production of IA-58 Pucara counter insurgency aircraft started in the early 60s but due to political reasons the production was delayed. Pucara is supposed to be an indigenously produced aircraft but design is similar to that of US Rock well-Ov-10 Bronco and its components are provided by various countries namely, USA, England, France, West Germany, Belgium, Switzerland, Australia and Sweden. Pucara aircraft has proved its place in the Argentine Air Force as its performance during the Falkland war is commanded.

In response to the government's desire for the manufacture of a new generation of jet trainers in the 1970s, the IA-63 advanced trainer was being produced in conjunction with the West German Dornier and to meet this requirement a budget of $200 million is being allocated for it. The new trainer aircraft (100, IA-634) are to be inducted into service, some time in 1986.

Though fixed wing-aircraft is its prime product, work for the production of helicopters has been taken up seriously.

Most of the aircraft manufacture is backed by US, British or French engines which are either imported or locally assembled. The Argentine aircraft industry has over the years managed to produce some indigenous engines despite shortcomings in terms of large metal castings or specific types of turbine blades for jet engine.

The private sector in the production of aircraft in the Argentinien set up is important and dates back to the beginning of the 20th century. Currently there are about thirty privately owned factories which provide services, spare parts, overhaul and manufacture parts for the Argentine aircraft industry.[8]

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8 Ibid., p.42.

A large number of companies are engaged in the production of armoured vehicles and heavy artillery within the framework of DGFM. The most active and productive company is Fabrica Militar de Rio Tercero.

The first armoured vehicle indigenously designed and produced by Argentina was in June 1944. The 35 Ton Nahuel DL-43 tank was manufactured by the Argentine military-owned industries. A limited number of these vehicles were produced and the main armament of the Nahuel DL-43 was a German 75-mm cannon. Consequently with the increase in the supply of cheaper war surplus (US M-41 Sherman) the production came to a halt.

With the adoption of "Plan Europa" in mid-1960s the AMX-13 light tank (armed with a 105 mm cannon) and the infantry combat vehicle AMX-VCI were assembled. The French helped Argentina with the production of AMX-13 light tank and later in the 70s it was modernized by a private engineering company (Talleres Metalurgicos Norte).

In order to replace the obsolete M-41 Sherman tanks, the Army called upon the West German company Thyssen Heuschel to design and develop a new medium tank for production in Argentina under the designation TAM. This was to hold time for an infantry combat vehicle called VCTP. The prototypes of TAM

tanks for trials were released in 1977, and two years later the first TAM tanks were produced and completed at San Martin.

Under the guidance, supervision and jurisdiction of DGFM in 1980 a new military State company was founded mainly for the production of TAM, VCTP and the TAMSE (Tanque Argentino Mediano Sociedad del Estado).

Indiganisation upto 70 per cent of the various components of TAM tanks have been successfully achieved by Argentina. The various components manufactured locally include armament, consisting of a 105-mm cannon and a 7.62-mm machine gun. Federal Republic of Germany provides the engine for this tank along with the gear box, parts of the optical system and the fire control system.

Also the Italian-designed Model 56 Lowitzer was assembled in FM. Besides this CITEFA (the Armed Forces Technical Research Centre) developed a 155-mm Lowitzer an improved version of the French MKF-3 155-mm gun.

The history of Missile Technology is not very old and its development difficult to measure. Hence, CITEFA started to work on missiles in the early 1970s. As Argentina had some experience in manufacturing rocket artillery by 1974 it succeeded in completing the missile related projects. Mathogo anti-tank missile ATM was the first major break-through. It supposed to

have incorporated the German technology as it bears a close resemblance to the German-designed Cobra missile which is also being produced in Brazil under licence. Especially after the Falklands/Malvinas War, the Argentine government has shown great interest in the design of more sophisticated air-to-surface (ASM) and surface-to-surface missiles.

Argentina has a long history of naval ship-building dating to the 1930s. This tradition relates not only to repair and maintenance but of course to the indigenous construction of vessels. The two major warship giants are the State company AFNE (Astilleras Y Fabricas Navales del Estado) and the private company (Astilleras Domenecq Garcia - Tandanor).

In Latin America AFNE is considered the most advanced shipyards in the area. It employs about 5,000 people and was established in 1953 as a State enterprise. The total strength of the Argentina shipbuilding industry is about twelve major shipyards and 100 small companies producing merchant and fishing vessels.

The shipbuilding industry in Argentina has always being favoured, protected and encouraged by the State. The encouragement and protection have come through special long-term credits at very low rates, exemption from customs duties on the import of materials and equipment, and subsidies for the construction of certain types of ship.

The national steel company SOMISA in effect provides 80 per cent of the required shipbuilding plate but other requirements like special steel, profiles are imported. The Argentine industry has the potential and capability of providing all the above components but due to the existence of small markets it is not economically feasible.

The modernization programme of the Argentine Navy can be easily put into three phases. The first phase was in 1926 when government decided to spend 75 million gold Pesos (then worth US $75 million), to be divided accordingly over ten years.

During the second phase the indigenous production was on the lower side and the government had managed to acquire different types of warships from Europe and the USA after the World War II.

The third phase of modernization in the 1970s and 1980s mainly focused on both domestic production and overseas acquisition of naval vessels. It all started at the Tandanor shipyard in 1968 with the order of the two Type 209 submarines from Howaldswerke Deutsche Werft AG of the West Germany.

Argentina also signed a contract with Vickers Limited, of England for destroyers (Type 42). In accordance with the conditions of the agreed contract one to be built at Barrow-in-furners (UK) and the second at AFNE's Rio Santiago shipyard with British assistance.

A contract with Thyssen Nordseewerke of West Germany was signed in 1977 for the licenced production of four type 1700 submarines. The Astilleras Domecq Garcia was re-opened in 1982 after the modernization of the company for the purpose of production. At the same time at AFNE with a licence from Blohm and Voss (FRG) production of six Meko-140 Type frigates began.

It is expected that these ambitious projects will be completed by 1987, which will enable the Argentine Navy to modernise its combat fleet.

In terms of types of warship, namely transport, landing-ships tankers and auxiliary ships the Argentinian shipbuilding industry can be considered self-reliant. Argentina's future plans include building of a nuclear powered submarine and one aircraft carrier of about 30,000 tons.

In the production of ammunition and small arms Argentina has a long experience dating back to 19th century. The copies of Mauser rifles called Madalo Argentina of 7.65-mm calibre were produced way back in 1891. The Madalo Argentino 1909 rifle, a version of the 7.65-mm German Mauser Gewehr 98 was adopted some years before World War II in 1909.

The first sub-machine-gun reached the proto type stage but the first sub-machine-gun manufactured in serial production

was the Halcan MP-43 (with a 45-mm bullet) from which several other models were developed (e.g., the MP-46, Model 49, ML-52/60/62/63).[9]

The production of several types of pistols, rifles, machine-guns, grenade, mines, bombs and ammunition of both indigenous design and under licence have continued especially by two well known military factories namely Domingo Mathey and Fray huis Beltran.

The FAA-81 (Fusio de Asito Argentino) a new assault rifle was produced in 1974.

A large variety of indigenous foreign designed artillery weapons have been manufactured by the Argentine industry which has a long experience dating back to 1812.

The UNIMOG truck which is the standard transport used in the armed forces is being produced by the Argentine Mercedes-Benz. This particular truck is turned into a tank by fitting it with the Cobra anti-tank missile.

Unlike Brazil, Argentina's arms production is directed toward the national needs but technologically it can be considered on par with that of the Brazilian industry.

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9 Ibid., p.48.

President Alfonsin's policies are intended to produce more export oriented weapons and attracting a market in the Third World. As a result of change in policy the Government handed over substantial authority to the Foreign Ministry in this field. This would mean that the government is careful about the type and range of weapons to be exported.

Over the years Argentina has managed to supply a variety of weapons to Central Republic of Africa, Panama, Peru, Paraguay, Uruguay, Venuzuela and El Salavador.

As far as the figures for exports are concerned they look incomplete and often contradictory. According to reports of the foreign press, the Argentina arms industry is to have exported $40 million worth of arms between 1966 and 1975 and $7 million in 1976. If we are to look at other claims the arms sales "have not exceeded $200 million a year in the past and for the year 1984, the estimates are to the tune of $450 million".[10]

The Peruvian government has purchased the TAM tanks (eighty)at a unit cost of $1.5 million to 1.7 million. This deal included the licence manufacture of the tank at some later stages. In another deal TAM tanks ordered in 1980 were

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10 Ibid., p.49.

delivered to Peru in 1981. It has also bought the Pucara aircraft. Also the Panama government has signed a contract for the delivery of sixty TAM tanks with FM. These tanks are to be fitted with the Fiat V-8 MTCA turbo-charged diesel engine.

Several other countries like Pakistan, China, Libya, Iraq, Syria, Egypt and Indonesia have also shown interest in the purchase of TAM tanks. It is reported that the Argentine government cancelled a military deal with Iran in 1984 for the supply of 100 TAM tanks.[11] The cancellation of the deal came due to fears of heightening of the tensions in the Persian Gulf. Also the Saudi Arabian leaders pressurized the Federal Republic of Germany to cut off the supply of parts to Argentina for TAM tank assembly. However, Iran is still supplied artillery shells and light ammunition.

Argentina has supplied Paraguay with two Rheinal DL-43 main battle tanks between 1954 and 1956. Negotiation for the delivery of an order of twelve IA-58A Pucara aircraft to Central African Republic is still on.[12]

Uruguay has received (6) IA-58A Pucara aircraft in 1981 and negotiation for the delivery of (24) IA-58A Pucara aircraft is going on with Venezuela.

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11 Defence and Foreign Affairs Daily (Washington), vol.13, no.12, 24 January 1984, p.1.

12 V. Millan, n.6, p.49.

In 1976 in connection with military aid Argentina increased its exports of light weapons to Central America.

A major role has been played by Argentina in terms of training and financing Nicaraguan and anti-Sandinist rebels. According to military and government sources $2.5 million worth of arms were shipped for Nicaragua's anti-Sandinista rebels to Honduras. These included rifles, ammunitions and spare parts. An army delivery to the tune of $17.2 million which included the Argentine FNFAL 7.62 automatic rifle and the FMK-3 sub-machine-gun was received by El Salvador in 1982.[13]

The government of Raul Alfonsin also authorised the fulfilment of a $69 million contract for the sale of rifles and 105-mm recoillers rifles to Guatemala, a military government. These arms shipments were justified with the argument that shipping was preferable to breaking signed and partially fulfilled contracts.[14] Reports from Buenos Aires claim that Argentina is stepping up its arms exports efforts and has recently achieved orders worth about $210 million from Jordan and Morocco for the supply of light tanks and Pucara turboprop light attack aircraft respectively.[15]

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13 Ibid., p.49.

14 Ibid., p.49.

15 Strategic Digest, "Arms Transfers", vol.XVI, no.1, January 1986, p.64.

BRAZIL

Brazil ranks third among the Third World arms producers and is considered to be extremely successful and also a pace setter for many ambitious developing countries. Brazil has a lucrative arms industry and its sophistication and export rate is expected to be growing rapidly in the years ahead.

Brazil's main focus has been to develop its production capability and technology in order to offer weapons to any interested party. The growth of Brazilian arms industry is a process which has gained momentum in the late 1930s and attained maturity in the last 20 years. This need initially was tied down to a demand for steel industry and not merely as a foundation for arms production. It could also provide Brazil with technological and logistical capabilities for overall development.[16]

In the 1930s some officers believed that in order for an industry to develop the country as a whole had to undergo broad industrial development, i.e., it was impossible to have

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16 Alexandre de S.C. Barros, "Brazil" in J.E. Katz (ed.), Arms Production in the Developing Countries (Mass., 1934), p.75.

the former without having the latter. It was clear to the military that an industrial base, trained manpower, organisational capability and technology were sine qua non conditions.[17]

Taking into consideration the complexity of arms manufacture and sizable investments, it prevented the civilian industrialists to enter this sphere while the military sector had the advantage of having the capability to think on a long term basis. Also the armed forces in sheer numbers afforded the capital and manpower investment for the development of the arms industry.

Here, Brazil during its period of growth and development accompanied with crisis, managed to go along because of its pol-socialisation. On the other hand, the role of Brazil is armed forces must be appreciated as they had a healthy perception of their institution's capability to continue the work without being affected by the change in leadership.

Another factor worth mentioning is that Brazil has had a very peaceful relationship with its neighbours and never has been directly involved in the global bloc-politics.

Geisel's administration is understood to have been responsible for the major breakthrough in the arms industry

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17 Ibid., p.75.

where the twin objectives of development and security were consolidated. He preferred development to security.[18]

Therefore, with the expansion of the basic industrial infrastructure the government supported projects and industries related to cars, trucks, buses and earth-moving vehicles, side by side with many other industries developed often for the purpose of export.

Arms production efforts began in the mid-1960, with much enthusiasm. Various arms orders were placed in Western Europe which was to facilitate the slow and gradual transfer of production technology which included the supply of units to local assembly and latter culminating in indigenous production.

Although several changes had been responsible for arms industry's development, especially in the mid-1960s, US decision to put a limit on the transfer of military technology became a source of strength and Brazil moved away from US sources of weaponary. This was further reinforced in 1977, with the Carter administration's opposition to the German-Brazilian nuclear sales agreement and helped consolidating a high level support for greater arms-self-sufficiency. The Brazilian government promptly renounced the 1952 military agreements with the US.

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18 Ibid., p.76.

After the break, Brazil decided that it could no longer be totally dependant on a super power for weapons and parts.

Another factor which further advanced the arms industry in 1982, was the Falkland war which in turn reinforced this drive to self-sufficiency where Argentina faced the embargo of spare parts and equipments. It also proved the fact that Latin America was no longer safe and wars could be brought to their door steps by other powers. Brazil thought it imperical to keep its options open and it could be achieved through more autonomy mainly in terms of arms supply without hurting the US at the same time.[19]

The military has an overriding advantage in terms of technical manpower and investment capabilities, but at the same time Brazilian arms industry is characterised by close cooperation between the public and private interests. Special fiscal and monetary incentives for production and R&D from the government is very much essential. The "Technology Park" at Sao Jose' da Campos is a good example of the existing collaboration of the two sectors where joint arms production projects of high standard are carried out.

The naval production and small arms production is assured by the State. Vehicle sector is privately owned, while in the

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19 Ibid., p.79.

aerospace sector there is both private and public ownership. In order to streamline, commercialize and coordinate the production of small arms and ammunition, the State arsenals and other State enterprises producing them were combined under IMBEL (Industria Brasileira de Material Belico), in 1975, though it did not include the naval yard.

There are many forms of mixed State and private capital for example via prescribed share holdings (as in the case of Embraer), or via State institutions such as the branches of the armed services, regional authorities, banks or regional development funds.[20]

When it comes to supply of components for arms production, the role of multinationals becomes significant but they are not involved in the final production of various weapons.

Unlike producers in developed countries who design weapons for their own armed forces, Brazilian arms manufacturers look first to the export market which basically absorbs 90 per cent of production. This in a way allows Brazil to finalize the designs of a production in conjunction with Third World buyers. Low cost material and labour are considered to be very advantageous for Brazil. Keeping these factors in mind, the

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20 P. Lock, "Brazil: Arms for Export", in M. Brzoska and T. Ohlson (eds.), Arms Production in the Third World, (London, 1986), p.83.

Brazilians are confident that they will continue to fill the low-end of the Third World market with their inexpensive weapons of simple design and easy operation.

Also the importance of exports rests much more on the role they play in relation to the foreign policy of Brazil.

Since the early 1970s Brazil has attempted to adopt an independent foreign policy to defend its national interest rather than strengthening its position in the international arena. In this attempt it has tried to develop its relation with the Third World nations, especially those which could constitute the potential market for Brazilian weaponary. Latin America, Africa and the Middle East are the key areas of interest for Brazil and over the years it has been investing for improving and strengthening its commercial and diplomatic ties with the countries of these areas.

There are about 350 arms producing companies in Brazil both private and State owned. Their turn over variesfrom $4 million to $205 million a year and accordingly their employment ranges between 345 and 100,000.[21] In addition to the tremendous employment generation, the Brazilian Government supports exports of arms through a concessionary tax structure. In accordance with the Brazilian tax

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21 International Herald Tribune (Paris), 9 October 1984.

policies all exporters are entitled to tax exemptions for value added in exported goods and the arms industry receive additional tax exemption facilities and subsidies.

There are three basic sectors or divisions in the Brazilian arms industry: (1) the Aeronautical sector; (2) Missiles and Rockets sector; and (3) Armoured vehicles sector.

In 1969 EMBRAER was set up by the government after attempts for getting experienced aircraft manufacturers to establish a Brazilian subsidiary did not succeed.

As far as the installation and technical and skilled manpower was concerned the company was assisted by CTA (Centro Tecnico Aeronautica). Initially under the guidance of a well known French designer Max Holste a twin-engined sturdy light transport aircraft with both civilian as well as military application was developed.[22]

Also EMB-110, due to cost effectiveness and serviceability managed to acquire a good reputation and by 1984, 450 aircraft were manufactured, 200 out of which were exported.[23] For licensed production of the MB-326 jet trainer, Embraer entered a contract with the Italian manufacturer Aeronautica Macchi.

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22 International Herald Tribune, 7 September 1982.

23 Aviation Week and Space Technology (New York), 21 May 1984.

Table I

DATA ON EMBRAER'S PERFORMANCE

Year	Number of aircraft delivered	Percentage of private share holders	Exports ($ mn.)	Number of employees
1970	-	18.1	-	595
1971	5	49.3	-	1128
1972	33	68.7	-	2031
1973	60	78.3	-	2621
1974	87	83.7	-	3323
1975	227	84.0	5	3553
1976	469	86.0	20	4225
1977	392	87.3	12	4100
1978	290	89.2	38	4305
1979	436	90.8	70	4887
1980	431	92.0	85	5785
1981	261	92.9	102	5414
1982	-	-	-	6732
1983	190	-	450	7000

Source: Lock, n.20, p.86.

The manufacture of the above aircraft was considered to be technologically advantageous and safe. Embraer expanded its co-operation with Aermacchi and both agreed to jointly produce a first model for the Xavante, of course two-thirds by Brazil. Now the Italo-Brazilian AMXI trainer/light strike aircraft has reached the prototype stage and likely to enter production in 1986. The export viability of this aircraft cannot be judged at present.

In 1978 Embraer started the production of EMB-312 and this design has been internationally acclaimed and so far orders have been received from Egypt and Iraq. In 1985 the Embraer won the competition for the best basic trainer, which was organised by British Royal Air Force.

There is a strong belief that Brazil soon will go for the production of its own supersonic fighter aircraft which will be the replacement for Mirage III and F-5EJ which is presently under production with the help of foreign partners.[24]

If we are to analyse the above table it is apparent that though the production of aircraft began in the late 1970s only after 1974 Brazil's government aircraft company has been in a position to export. The maximum number of aircraft has

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24 Aviation Week & Space Technology, 25 June 1984, pp.204-208.

been delivered in the year 1976 but the export in the following year has fallen. After 1978 the exports have increased and are still rising.

About 60 per cent of the components used in the production of these aircraft are imported and this fact becomes utterly important in terms of the growth of this industry.

Helibras is another company which is involved in the production of aircraft as well as acting as supplier of components for Embraer. Besides Helibras, there are two other small aircraft producers namely Avitec and Neiva.

Missiles and Rockets

Avibras founded in 1962 by a CTA graduate is located in the industrial park of Soo Jase' de Campos. Initial production consisted of propellants and parts used in space research on a very low scale.

Space research field ranks very high in the rest of the Brazilian priorities and adequate attention was given to it. Brazil's co-operation with various foreign firms has enabled it to acquire the needed space technology as well as providing guidance for production of indigenous nuclear capable medium range missile. Much assistance in this field is being given by West Germany. In the early 70s Brazil's CTA also started the design of other smaller missiles like the MAS-1 Carcora

ASM and the MA -1 piranta AAM. Cobra ATM, a West German designed missile was manufactured with the help of the Army under license production rights. By late 1970s, Brazil had managed to bring to the market rockets, bombs and integrated weapon system of high standard and sophistication. The best examples are the Astros I and II, multiple systems consisting of several heavy vehicles.

Brazilian sources report extraordinary export performances starting with $4 million in 1983, reaching $35 million in 1981 and passing the $90 million mark the following year.[25]

A large number of well qualified engineers are employed by Avibras. This obviously indicates the strong and keen support of the Brazilian government for its space programme. It has also been mentioned that Avibras has manufactured spare parts of Soviet weapon systems as pwer request of the Egyptian goverrment.

Avibras' three major plants are in operation in Sao Jose' de Campas Jacarei and Lorena. All in all, Avibras' performance is that of speedy horizontal and vertical expansion. The three subsidiaries of Tectran, Tectronic and Transhipare mainly engaged in the manufacture of specialized vehicles for military and civilian sector, in electronic and electro-mechanical equipment and in transport and travel each respectively.

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25 Lock, n.20, p.91.

Armed Vehicles

In the 1970s Brazil for the first time exported its armoured vehicles in large quantities to Libya. From the operational aspect these Brazilian armoured vehicles proved to be extremely successful and were used in the border conflict with Egypt. This was an instaneneous success for ENGESA and it was to become a significant supplier. Engesa when established in the State of São Paulo was dealing in the manufactures of army trucks and armoured vehicles basically suited the Brazilian conditions. The various components of armoured vehicle in Brazil were produced by the subsidiaries of foreign manufacturers. These armoured vehicles were suitable for bad roads and it was considered very reliable and serviceable.

Engesa grew rapidly during the 1970s. Its principle of design was described in the following way:

"Engesa's entry into the market began with its construction of trucks. Only their chassis and coach work are really Brazilian as the engines and many other technical components such as the gears are built under licence to foreign companies are imported. After its good performance on the market it was natural for the company to begin to manufacture armoured vehicles, given that they follow the same principles as trucks, i.e., the original design is

Brazilian and the high-technology components are produced under licence or imported."[26]

Engesa's export policy is the main factor responsible for its success in the international market both because of defence sector production and also because of a totally unbiased commercial policy.

The vehicles produced by Engesa fit the Third World environment. While incorporating modern technology both in the weapon and automotive fields, Engesa has an edge over thedeveloped States. Also Engesa's designs meet the "low technology demand of many Third World armed forces".

Engesa has always aimed at the production of technologically advanced military equipments. EE-TT OSORIO tank is a magnificant example of Engesa's efforts at achieving the above goal.

Another company which has succeeded in manufacturing armoured vehicles is Bernardini. Basically it was largely a manufacturer of office furniture etc., and in the year 1973 it received an order to bring about modifications in the US made tanks of the Brazilian army. These old tanks were acquired before World War II and this company managed to equip it with diesel engines ready for export. Various other

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26 Armies and Weapons, no.49, January 1979, pp.46-54.

assignments for the installation of diesel engines on M-41 tanks as well as modernising M-113 APCs were given to Bernardini. Also in collaboration with the engineer corps of the army, Bernardini was able to launch the design of a medium tank designated the MB-3 Tamoyo.

Ship Yards

Brazilian ship yards over the years has established itself as a fast growing industry which due to its competitive prices has attracted the attention of the developing nations. At the same time it has been able to get the well known and established manufacturer to set up subsidiaries. In this manner foreign investments have been encouraged and became a suppliar of merchant ships. Right from 1930s Brazilian yards have been receiving orders for small vehicles. It has also evolved the repair and modernization of the world War II vintage units which is parallel to the production of frigates under licence. With the help of US offshore agreement it has manufactured a large number of petrolcraft river patrol ships. Between 1971 and 1976 it has built around twelve of the above mentioned crafts.

As aresult of fall in demand for the merchant ship, the Brazilian naval yard has decided to go into the production of nuclear submarines. These submarines are to be designed and manufactured indigenously. Though Brazil is interested

in production and procurements of latest items for its navy but due to budgetory constraints will probably have to change its programmes.

Exports

Brazil has emerged as the significant Third World arms exporters. The International Defence Review put 1984 exports at $2.4 billion.[27] Brazilian official sources say the figure is closer to $1 billion. In any case the number is significant for a country which must produce a $12 billion trade surplus a year to pay nearly that amount in interest on mammoth $104 billion foreign debt. The arms export explosion is part and parcel of the general growth of Brazilian industry which accounted for more than half of the country's $28 billion in export revenues last year.[28]

Brazil looks at its arms industry as an important part of its national development programme and has decided not to purchase the most advanced weapons from abroad in order to boost its arms technology.

Brazil aims at fairly big growth rates for the future which in fact has been supported by the Brazilian arms lobby

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27 Richard Foster, "Brazil's Success in Arms Exports", Financial Times, 20 December 1985, quoted in Strategic Digest (New Delhi), vol.xvi, no.2, (February 1986), p.169.

28 Ibid., p.169.

to a large extent. There is a strong belief that in the years ahead Brazil would be in a position to impinge more fiercely on the traditional grounds of industrialized arms suppliers in the Third World.

"We will very quickly overpass our Western competition (in Third World export market)", says Jose Luiz Whitaker Ribeiro, President of Engesa on industrial group with 10,000 employees.[29]

The major direction of Brazilian arms exports is towards the Third World. "We are looking to the Third World", admits the Brazilian government armament agency, "and we'll sell to the right, the left and the centre".[30]

Engesa is the star of the Brazilian arms industry and has demonstrated an extraordinary aptitude to streamline its export strategies to Brazilian foreign policy. Engesa is accounting for more than half of the country's total arms exports, i.e., approximately $600 million. Engesa Company reportedly sells almost 1,000 armoured vehicles a year to 32 countries, mostly on arms-for-oil terms to OPEC members in

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29 Ibid., p.170.

30 John Taylor, and others, "New Arms Merchants", Newsweek, vol.98, no.19, 9 November 1981, p.28.

Africa and the Middle East.[31] In the early 1970s the above policy of "oil for arms" proved to be extremely favourable for Engesa's exports.

Therefore, the Islamic Countries are the main customers for Brazilian arms and in this respect Libya has acted as a "distributor" of Brazilian equipment. It was through the purchase of Brazilian Cascavel armoured vehicles, which became popular in the Middle East.

Brazilian rifle and machine guns are in service in Angola and Congo. Also many other small African States have purchased some aircraft and armoured vehicles from Brazil.

Iraq is now a steady buyer of Cascavel armoured vehicle and Brazilian air-to-surface missiles-used in its war against Iran.

Also Avibras has exported the Astros II, a multiple rocket launcher to Iraq.[32]

Brazil has attempted to create a good market for its arms in Saudi Arabia. Improvement of trade relations with Saudi Arabia becomes important in the light of its direct

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31 T. Ohlson, "Third World Arms Exports: A New Fact of the Global Arms Race", Bulletin of Peace Proposals (Chicago), vol.13, no.3, 1982, p.218.

32 Foster, n.27, p.170.

purchases and also posing as a major financier for Brazilian weapons delivered to Iraq.

The President of Brazil's Ordnance Industry (IMBEL) has announced that Brazil has concluded arms sales contracts with Saudi Arabia worth almost $1 billion, featuring Engesa's Cascavel armoured vehicles, as well as few Osorio tanks which are being tested in the desert.[33]

The Osorio is basically made tosuit both Saudi Arabia and Iraq perfectly. Brazil has used West German and British suppliers' production capacity. Engesa can claim that the tank is 100 per cent Brazilian.

Egypt is following the footsteps of the other Arab countries in purchasing weapons and entering co-production with Brazil. According to the announcements of Embraer, Egypt has received its first units of the Tucano training aircraft from Brazil. Egypt is also to co-produce 110 more Tucanos under the $180 million deal, with 30 going to the Egyptian Air Force and 80 to Iraq.

The neighbouring Latin American States have shown keen interest in purchasing Brazilian arms and more after the termination of the 1952 military agreement with the US during

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33 Defence and Foreign Affairs (Washington), (January 1985), p.1.

the Carter administration. This helped tremendously in enhancing and strengthening Brazil's position as a supplier to these countries. The main recipients of the Brazilian arms in this region are Paraguay, Chile and Bolivia. Chile patrols its coastline with the Bandeirante and Bolivia has bought six Helibrns military helicopters. It has been reported that in 1983 Brazil has supplied 33 countries with weapons and military equipments.[34] A variety of weapons including combat vehicles, aircraft, laser range finders, automatic guns, machine guns, pistols, grenades, ammunitions, anti-tank mines, canons martary air-to-ground missiles, surface-to-surface missiles, bridge layers, radio communication equipment and ships comprise Brazil's arms exports.

In the early 1970s there were two distinct trends in Brazil's transfer of arms to the Third World. Here it becomes important to state that its unsophisticated and lower-weapons were more acceptable. One trend relates to the wealthy buyers like Saudi Arabia which continue to purchase sophisticated weapons, while the poorer States give preference to high-low mix of weapon systems.

The government controls exports at three different levels. Orders must be transmitted via CACEX (Carteria de Comercio Exterior do Banco do Brazil S.A) which is the Brazilian foreign

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34 Financial Times, 21 February 1984.

trade authority. They are transferred to the Council for National Security (Conselho de Seguangcoo Nacional). Though few details are known, the national programme of export of commodities with military application (Programma Nacional de Exportcoo de Material de Emprego Militar) serves to co-ordinate production and to negotiate credit lines where they are necessary to support export performance.[35]

CHINA

China's defence industries produce a varied range of weapon systems, which include small arms to ICBMs with five-megaton warheads. China has always sought international recognition as a major power (regional power), if not super power. China has had border conflicts with its neighbours and still remains hostile to her powerful neighbours like USSR and India. In the late 1950s People's Republic of China (PRC) entered a period of international isolation as a result of the break with the Soviet Union. During the early 1970s there came about a major change in China's policy which is termed on "great leap outward" by diplomats and trade activists.

The establishment of an indigenous arms industry in the People's Republic of China after 1950s was primarily aimed at promotion of national security. When the Chinese Communist

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35 Lock, n.20, p.98.

Party (CCP) came to power in 1949, the country's arms build up consisted of small collection of arms, arsenals, small regional manufacturing facilities and Japanese-built plants in Manchuria The Korean war and the general influence of the Soviet military experts made the Chinese realise the need to develop its indigenous arms production bases.

The PRC during the 1950s followed the Soviet mode of military industrialization. In order to cope with domestic arms production a number of machine building ministries (MBM) were set up. With the Sino-Soviet rift in 1958-60, the Soviet military experts and technicians left China leaving behind a defense industrial system which structurally functioned on the Soviet pattern and in fact changed very little in the next decades.[36]

As the Soviet assistance was stopped the Chinese were forced to follow a policy of self-reliance which in turn had to take care of their fragile arms industry. As a result of this in the early 1960s the system underwent re-organization for optimum utilisation of its limited and scarce industrial as well as scientific and technological resources. The early

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36 Richard J. Latham, "People's Republic of China: The Restructuring of Defence Industrial Policies", in J.E. Katz (ed.), Arms Productions in the Developing Countries (Lexington, 1984), p.105.

1960s reflected the influence of particular policies and programmes which led to proper restructuring of ministries of machine industries (MMI). Specific ministries of machine industries were set up to supervise and manage the development and production of nuclear weapons (second MMI), aircraft (3rd MMI), electronic equipment (4th MMI), ordnance (5th MMI), naval vessels (6th MMI), and ballistic missiles (7th MMI).[37] Between 1979 and the organisational reforms of May 1982, an 8th MMI existed briefly with responsibility for the production of aerodynamic missiles.[38]

The Chinese leadership's major concern has always been and would be to manage and co-ordinate the main industrial decision-making processes. The National Defence Industries Office (NDIO) and the National Defence Science and Technology Commission (NDSTC) were formed for the purpose of co-ordination and general management of industrial problems. The NDIO and NDSTC merged to form the commission in-charge of Science, Technology and Industry for Defence (CSTID).[39] Gradually the defence industrial sector was becoming more and

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37 Harlon W. Jencks, From Muskets to Missiles (Boulder, Colarado, 1982), p.195.

38 Latham, n.36, p.114.

39 Ibid., p.115.

more integrated with other industrial sectors as well as State economic planning. For the purpose of optimum utilization of scientific and technological assets and also to reduce the financial and resource losses, the State Council's Science and Technology Group was formed.

Following the introduction of the Third Plenum economic reforms as well as the policies of economic readjustment and restructuring, China's defense — industries system under-went substantial change.

The Third Plenum reforms' main emphasis was laid on industrial profitability, which meant that if defence industries were incurring losses it would be treated like the civilian industries.

In terms of better management and efficient use of resources the defence industries were expected to increase this profits. Since the PLA was and still is the sole domestic consumer of military equipment within China, there were two possible ways to find new markets. The first was to begin producing civilian consumer goods. This was the primary direction in which defence industries and research facilities moved to find profits after late 1978. The second was to sell military equipment to foreign governments.[40]

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40 Ibid., p.116.

China's arms transfers both under military aid and arms sales mostly have been directed towards the Third World. A large number of Afro-Asian States have constituted the main recipients of Chinese arms. This list includes Albania, Egypt, Cameroon, Iraq, Pakistan, Guinea, North Korea, Rumania, Zambia, Zaire, Vietnam, Tunisia, Sudan, Sri Lanka and Rumania.[41] In this role, PRC has managed to act as supplier of spare parts to recipient countries which were receivers of Soviet weapons China has been able to fill the gap as these countries no longer had access to equipment or spare parts from the Soviet Union.

The kind of weapons that comprises China's arms exports can be divided into three broad categories: naval vessels, armaments, and aircraft. If we are to compare China's percentage share of arms transfers with that of the principal arms exporters they seem very insignificant. Within the area where China is active as an arms exporter, its percentage share of the region's total arms imports have, until recently also steadily fallen relatively to the share of the major exporters. This is true despite the fact that the actual value of China's exports has risen in three out of four regions. Actually the way the Chinese arms importers are geographically distributed at times coincided with the worldwide trends in

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41 Ibid., p.97.

major arms importing regions. During the period 1964-73, a large share of the Chinese arms was exported to East Asia, i.e., North Vietnam $915 million compared to Pakistan receiving $312 million, North Korea $190 million, compared to Albania $85 million and Tanzania $62 million as arms aid.[42]

In general if we are to compare the value of China's major arms transfers with those of the Soviet Union and the USA, France and other European and Third World countries, it is very small. But from 1970s there seems seems to be some indications of change in the Chinese arms export policies.

From 1970, China showed trends towards a qualitative increase in terms of production of sophisticated weapons and a major shift from aid to trade.

While during the early years of the PRC, China's small arms aid was co-ordinated and it did not follow a sustained programme of military aid. One important factor which dominated the Chinese arms aid policy was its own security.

The Chinese aircraft are basically copies of Soviet designs. However, over the years certain improvements over the original models have been achieved by China. The F-6, which forms 95 per cent of China's air force and a good part of its exports

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42 Anne Gilks, and Gerald Segal, China and the Arms Trade (London, 1985), p.30.

have been described as "the most highly protected obsolescent fighter on earth — vastly better than the best Soviet MIG-19."[43]

Initially, the Chinese were unable to manufacture major weapons and the MIG-15s that were delivered to North Korea were built in Russia. Between 1958 and 1960 Chinese supply to North Korea included 300 Shenyang F-4s (MIG-17) and 20 Shenyang Yak-18A besides four Fang-Shan-Number two transports delivered in 1957. Also the 80 MIG-15s, 40IL-28A and 20MIG-19s supplied during 1958-60 were probably second hand from the Soviet Union.[44]

The above figures are a good indicator of the Chinese embarkation on an independent foreign policy. This policy naturally aimed at a fairly large supply of arms to her two neighbours.

In 1964 China once again increased its arms supply, i.e., a significant number of MIG-15 and MIG-17s were received by North Vietnam. With the increase in arms manufacture in the late-1960s China supplied Pakistan with 80 MIG-19s, and 35 MIG-19s to North Korea.[45] The indigenous production of MIG-21s is a clear indication of the Chinese production capabilities in the field of aircraft.

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43 Ibid., p.60.

44 SIPRI, Arms Trade Registers (London, 1975), p.10.

45 International Institute of Strategic Studies, Military Balance, 1967-8 (London, 1967), p.53.

Bombers did not constitute a major portion of arms exports but on a smaller scale about 40 IL-28s were exported to North Korea in 1958-59 and a smaller number to Pakistan.

During the 1970s older MIG-based designs like F-2, F-4, F-6 and F-7 constituted China's aircraft supply. The increase in production enabled China to strengthen its exports during this period. It supplied a total of about 80 F-4s (MIG-17) to Democratic Republic of Vietnam (DRV), Albania, Tanzania and Sudan, 18 F-6s (MIG-19) to the DRV, Pakistan and Tanzania and 36 F-7s (MIG-21) to Albania and Tanzania.[46]

From 1977 to 1980 China's arms delivery expended as exports helped in keeping the production lines open. The Chinese air force was reluctant in increasing its stock of old models, so it indulged in the export of the obsolete MIG-17s. Some recipients like Pakistan and Sudan found them useful supplements to their trainers.

Another aircraft which has dominated the Chinese arms aid and exports is F-6 fighter which is domestically produced. Between 1977 and 1983 over 400 F-6 were delivered.[47]

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46 Daily Telegraph (London), 26 March 1976.

47 Anne Gilks and Gerald Segal, n.42, p.63.

The B.T.-6 trainer (a derivative of the Yak-18 trainer in production since 1961) and F-6 bis A-5, or Fantan A were the two relatively newly designed aircraft which featured in China's arms aid programme, during the late-1970s. Bangladesh, Zambia and North Korea are the main recipients of the BT-6s. Each of them having received about 10 aircraft during 1978-79. The F-6 bis appeared for the first time in 1970 and was brought to service in 1975. Pakistan and North Korea have been given 65 BT-6 and 20 F-6 bis A-5 aircrafts each. The low cost of F-6 bis attracted many buyers. Pakistan was the main beneficiary as this particular aircraft was built specially to suit its air force requirements.[48]

This was the first time that China had built aircraft in accordance with the need of a client and it could be considered a new departure in China's military aid policy and this in itself was a good indication of the fact that Chinese were shifting their attitudes towards arms sale.

A major spin off from China's aircraft aid programme has been the extension of aid to construct air fields capable of taking aircraft which China would supply. In 1973 just before the supply of 12 F-6, 20 F-6 and 16 F-17 to Tanzania, China completed the construction of an air field near Morogoro.

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48 International Defence Review (Washington), 5 September 1983.

It was reported that Chinese were instrumental in building a new airport capable of handling jet fighters in Kampuchea. At the same time China supplied a total of 21 F-4s and 20 F-6 to Tanzania.[49]

The tanks manufactured domestically in China are mainly copies or developments of the Soviet models similar to the aircraft. China has produced the T-57 main battle tank (Soviet model) and after the Sino-Soviet thaw it has attempted to produce a modified version. The type-59 and type-2 a copy of the Soviet M-76 light amphibious tank, modified to a certain degree in order to make provisions for mounting a 12.7 mm anti-aircraft gun in the turret were also manufactured.

In 1966 for the first time 100 type-59s were exported to Pakistan. The ravages of the Cultural Revolution or China's perception of Pakistan's security needs — or both — might be the reason for the fact that no more were supplied until a delivery of 110 in 1970-71. In a manner to protect Chinese investments in the Tazora Railway, in 1967, 14 type-62s were exported to Tanzania.[50]

Again in the 1970s, the increase in the exports of tanks

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49 SIPRI, World Armament and Disarmament Year Book, 1974 (London, 1974).

50 Sunday Telegraph (London), 11 February 1968.

was visible and to start with China sold 110 type 59s to Pakistan. By 1972, China's aid policy expended largely to include 100 type-59s to Pakistan, 20 to Tanzania, 10 to Sudan and 200 intended for the PLO. This basically aimed to bridge the gap and cover up the losses incurred by Pakistan during the 1971 war. In 1975, Zaire received its first tanks (25 type-59s) which were used in Angola.[51]

China at this juncture attempted in exporting a greater variety of models. By 1975 both Tanzania and Albania received 40 type-62s. Also Sudan and Congo Republic were supplied 20 and 14 type-62s respectively. North Vietnam received about 100 type-62s in 1971 and Somalia 12 light tanks (type-62s). China's tank exports have followed the same pattern as aircraft. China's export of tanks increased tremendously after 1977 and especially in the 1980s.[52]

The K-63 APC (Armoured Personnel Carriers) which were produced since 1960s were exported to China's main arms recipients. The type-59s have managed to capture a large market which had led to increase in the level of production. In 1975 as against Pakistan's order for 1,000, she received 50 annually beginning in 1978. Also during the early 1980s

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51 SIPRI, World Armament and Disarmament Year Book 1976 (London, 1976).

52 Jane's Armour and Artillery, 1982-3 (London, 1983), p.135.

North Korea and Bangladesh received the same, basically all second hand.[53]

Quite a number of type-62A have been supplied to Zaire, Sudan and Mali. Also K-63 APC which was first manufactured in the late 1960s appeared in China's arms exports in 1977. Pakistan, North Korea, Albania, Tanzania, Sudan and Zaire were the main recipients. This seems to point out that China was willing to supply arms to important clients while China's own armed forces were being equipped.

China has succeeded in the completion of the production of type-56 and type-55 APC. There are reports regarding their export to Kampuchea, Tanzania and Vietnam. Egypt received 40 second hand ones.

As with aircraft, new tank models began to appear in China's aid programme, in one case as a military sale in the 1980s. A total of 200 type-69 main battle tanks, only recently produced in China and valued at $1,000 million, were to be supplied to Iraq under an agreement in February 1983. The type-69 had first been seen in China just the previous September.[54]

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53 International Institute of Strategic Studies, Military Balance, 1982-3 (London, 1982), p.88.

54 Jane's Armour and Artillery, 1983-4 (London, 1984).

In 1978 the Soviet Union faced a sudden fall in its 90 per cent share of arms exports to Less Developed Countries (LDCs) while China succeeded in maintaining a near record sale of $96 million to LDCs accompanied with East European sales of $465 million.[55]

In the case of surface-to-air missiles (SAMs) China's production has been limited while it has actually manufactured copies of the Soviet SA-2. These have been produced in very small numbers and till 1966 none were exported. Albania is the only ally which received Chinese SAMs in 1967. In the wake of the Soviet invasion of Czechoslovakia in 1968, China supplied Albania with more SAMs and rockets. There are reports regarding 500 Chinese experts supervising the construction of missile installations.

China's supply of SAMs did not go up unlike its other weapons. It is said that China apparently learned a lesson from the 1973 Middle East War when SA-7 proved extremely effective. (China launched the production of more sophisticated models.) However, in 1979 on Pakistan's order 20 SA-1 (all new) were made and deployed in 1980. Egypt also placed an order for the same missiles.

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55 Anne Gilks, and Gerald Segal, n.42, p.66.

AJ-3 anti-tank missiles were under production in China till 1979. In 1978 it had produced 300 anti-tank missiles out of which 200 were all new, with 33 second-hand launchers and were supplied to Kampuchea. Type 52-75 mm anti-tank guns made an appearance for the first time in China's 1981 list of arms exports. Both Pakistan and North Korea are in possession of an unspecified quantity of these missiles. China's anti-tank guns export acts as a major catalyst in modernizing the Chinese ground forces. It is reported that the production of anti-tank guided missiles have shot up in 1983.

Along with China's arms aid programme the supply of light and medium mortars began too. Though relatively speaking China itself was short of self-propelled artillery, between 1964 and 1971 Hanoi was supplied with 37,000 artillery pieces and 18.8 million artillery shells. Hanoi also received supplies of 37 mm type-63 self-propelled anti-aircraft guns.[56]

During the 1960s besides North Vietnam, Pakistan and Albania were recipients of the Chinese artillery. The supplies included 85 mm anti-tank field guns, 100 mm, 130 mm field guns, 107 mm multiple rocket systems and 60 mm and 82 mm mortars.

Early in 1970s Chinese production of artillery rose and

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56 New York Times, 13 July 1979.

a whole new set of mortars were supplied. During this period China's arms spread to Africa. Both medium and heavy artillery were supplied to various guerrilla and national liberation movements in Africa.[57] The 85 mm field guns were exported along with anti-aircraft artillery. By 1982 these were in service in Albania, Mozambique, Vietnam, Congo, Cameroon, Pakistan, Sri Lanka, Tanzania and Zaire. Heavy artillery has been received by China's major clients like Albania, North Vietnam, Pakistan, North Korea, Tanzania, Congo, Egypt, Sudan, Zaire and Zimbabwe. Again there was further increase in the exports of artillery after 1979, accounting for a significant portion of production.

As far as naval vessles are concerned, the Chinese production has been geared towards coastal defence and China's military supply consists of petrol boats with some submarines. Naval vessels, like other defence items manufactured in China, are copies of Soviet designs. The first batch of naval vessels was supplied to North Vietnam (30), and North Korea (24 small 20 ton) inshore mine sweepers in the late 1950s.

By the mid-1960s the Chinese were able to assemble and manufacture Swatow and Shangfai-class patrol boats of up to

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57 International Institute of Strategic Studies, Military Balance, 1974-5 (London, 1974), p.44.

120 tons displacement and Huchovan hydrofoils. Between 1964 and 1971, deliveries to Vietnam consisted of 147 vessels and it is reported that Albania also received an unspecified number of vessels. Other States like Kampuchea were supplied 3 small patrol boats in 1968 and the Tanzania and Congo received four boats in 1966 and 1968 respectively. Four Shanghai-class patrol boats were delivered to North Korea in 1967.[58]

During the 1970s annual growth in China's shipbuilding picked up and almost doubled compared to the previous decade. So naturally, China's arms supply increased simultaneously: the figures being 1950-60 (18.3 per cent); 1960-70 (10.9 per cent); 1970-74 (23 per cent).[59]

As a result of various military agreements China supplied Tanzania with six Shanghai-class petrol boats in 1969 and Pakistan with nine Shanghai-class motor gun boats in 1971. North Korea received eight Swatow and fifteen Shanghai-class boats and Albania received six Shanghai-class MGB. A smaller number of these vessels were given to a number of African States: Sierra Leone (2 in 1975 and 1 in 1978), Guinea (4 in 1972 and 2 more in 1977 with no advisers), Cameroon

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58 New York Times, 13 July 1977.

59 Anne Gilks and Gerald Segal, n.42, p.70.

(2 refurbished in 1977), Equatorial Guinea (2 in 1975). Zaire and the Congo Republic in 1978 received 2 and 3 patrol boats respectively.[60] South Asia, too received its share of Shanghai-class MGB. Five were given to Sri Lanka in 1972 and two more in 1980; Bangladesh received four in 1981 and Pakistan's total increased to twelve in the same year. Tunisia is the only State which has received Yulin River Patrol craft (second hand) in 1977.

The latter part of 1970s saw an increase in the export of more and different types of vessels. Tanzania, Pakistan, Albania and Rumania received Huchuan Hydrofoils between 1974 and 1981. Hainan-class large patrol boats were supplied to Pakistan, Bangladesh, North Korea and Egypt, all in very small numbers. Pakistan is the only privileged state which has been supplied with Haku (fast attack craft) in 1983.[61]

Due to limited production and stock of patrol submarines China has managed to supply very few of them. The growth in China's submarine manufacturing has been slow. In 1960, China had 12 in 1962, 2; in 1970(→ and by 1977 it has increased by over 30 per cent i.e., 46 submarines. By 1977 China's

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60 SIPRI, World Armament and Disarmament Year Book, 1974 (London, 1974), p.80.

61 International Institute of Strategic Studies, Military Balance, 1983-4 (London, 1983), p.97.

submarine force acquired the third position in the world. Around this time although China's own stock was yet to be built up, she still delivered 2 "W" class submarines, as grant/aid to Pakistan. This was done in view the increased Soviet naval presence in the Indian Ocean.

In short, the supply of submarines has been very small. Pakistan, Bangladesh, North Korea and Egypt have received second hand vessels. Among them, North Korea has received the largest number (six new "R" class) of submarines. North Korea also has entered into licensed production after 1978.

China's exports have not been large in this sector but there is some possibilities of expansion.

So far Pakistan has been the only State to receive Chinese destroyers. There is also some reports regarding an agreement with Egypt indicating that Cairo has ordered four Luda-class destroyers.[62]

During the 1970s there was a clear shift in China's arms aid programme. It more or less followed the trends in global arms transfer which basically meant signing agreements for licenses for the production of Chinese arms in other countries. Though many of the recipients of her arms are technologically

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62 SIPRI, World Armament and Disarmament Year Book, 1977, (London, 1977).

fit for production of arms, this method of giving out licences has been adopted so as to cover up various shortages. In certain categories of weapons where China is unable to meet the demands of her client States, these are allowed to be produced outside.

On the other hand, it is likely that the Chinese would hope to expand these countries licenced production since it could take strain off its own production capacity.

In general, China's arms exports have reflected both its production, logistic capacity and its changing global perceptions. Almost all of China's indigenously produced arms are copies of older Soviet models. For this reason — if for none other — China has not followed the trend of the world's major arms exporters towards selling increasingly sophisticated weaponry.[63] The provision of arms to various insurgent groups and national liberation movements depended on the movement's potential. On the whole, Beijing has made fairly realistic appraisals of recipients. This reflects not only Beijing's reluctance to commit valuable, and sometimes scarce arms and more importantly its prestige, to a racing horse, but also a technological problem namely that an insurgency in its infancy cannot absorb large quantities of advanced weapons.

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63 Annie Gilks and Gerald Segal, n.42, p.158.

China's global perceptions began to change in the 1970s and the focus of its united front switched from revolutionary movements to States.[64] China's late entry to the ranks of major arms suppliers and granting of licences for production is due to the shortage of clients who have the necessary infrastructure to produce the dated Chinese weapons.

Strictly speaking China's national security concerns the defence of China's territorial integrity, and extend in a more dilute form to maintaining the regional balance of power in other parts of Asia.

Since it began as a sustained co-ordinated programme in the late 1950s, China's military aid, despite protestations to the contrary from Beijing, has been largely motivated to obtain international influence.[65]

INDIA

In Asia besides China, India is one of the major arms producers. Over the years India has aimed at intensifying both indigenous production and the import of arms which in turn is directly related to its past military conflicts.

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64 Ibid., p.159.

65 Ibid., p.174.

According to official statements, India and its neighbours are affected by "great power rivalry" and the "scramble for base facilities and areas of influence in the Indian Ocean",[66] fueled by increased naval presence of the USA and the USSR there. To be able to meet this challenge India's policy planners have adopted basically three strategies to increase its military power and preparedness. Firstly, it has imported sophisticated conventional weapons. Secondly, it has already established nuclear and space programmes on a grand scale which have latent military potential. Thirdly, it has developed a diversified military — industrial — research complex. Indian defence officials created an indigenous military production capability with the hope that it would reduce dependence on imported military equipment, reduce foreign exchange costs for the defence budget, and create a research and development capability sufficiently broad and dynamic to produce current-generation military equipment and serve as a catalyst to an advanced technology industrial sector.[67]

Historically, a network of ordnance factories have catered to the requirements of ordnance and weapon systems.

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66 Government of India, Ministry of Defence, Annual Report, 1983-84, p.1.

67 Thomas W. Graham, "India", in J.E. Katz (ed.), Arms Production in the Developing Countries (Lexington, Mass., 1984), p.157.

After independence the ordnance factories took on the role of safeguarding India's sovereignty and security and the twin objectives of self-reliance and self-sufficiency became the primary concern of the defence production apparatus.

The task of defence preparedness is shared by two prime streams of 33 ordnance factories and 9 defence public sector enterprises.

The two streams together currently accounts for a very large and diversified range of sophisticated products, a work force of around 2.8 lakhs and an aggregate value of production of nearly Rs.2,000 crores.

The history of arms production in India is very old. In 1801 the first ordnance factory was established by the British. By World War II there were six such factories and further expansion took place afterwards. At the time of partition India retained 16 ordnance factories, a clothing plant, and an aircraft factory were also within the Indian territory.

India's arms production until mid-1950s was confined to small arms. An aircraft-carrier and modern jet aircraft were imported from the United Kingdom in the late 1950s. In the second half of the 1950s Pakistan joined the CENTO (Central Treaty Organization) and SEATO (South-East Asia Treaty Organization) military pacts which led to the acquisition of

modern military equipment by Pakistan. This provided the first major impetus for large-scale procurements of weapons from outside as well as through domestic licensed production. Tanks, bombers, fighters and aircraft were purchased from France and Britain. The Indian government also signed an agreement for licensed production of a British jet fighter (The Gnat) in 1956, which entered into service in 1963. In 1956, with West German assistance started the indigenous jet-fighter (HF-24 Marut).

In the late 1950s, under the then Defence Minister Krishna Menon, "ambitious plans" for self-reliant arms production were formulated. But due to manifold economic problems relating to scarce economic resources, small industrial base and fragile foreign-exchange reserves India was unable to fulfil and implement these plans.

In the early 1960s there was a shift in India's arms procurement policy following increased tensions on the Sino-Indian borders and the military defeat in 1962. The government though faced with economic difficulties went ahead with increasing its military budget. By 1963 six additional ordnance factories were installed and other projects for producing small arms were expanded.

Before the outbreak of the Indo-Pak war an agreement was signed with the Soviet Union for the manufacture of MIG-21

fighters. In 1965 after the Indo-Pak war, the expansion scheme was further urgently enhanced. Several major licenced and indigenous production projects for army equipment, including major battle tanks as well as fighter, trainer and transport aircraft, helicopter, missiles, and major fighting ships, were under way during the 1960s.[68]

The period after the 1971 Indo-Pak war was characterised by a continued growth of existing projects for indigenous and licenced production.

The situation in the late 1970s took a new turn. Once again India's decisionmakers laid more emphasis on a variety of new licence agreements with different countries. Today, the situation is drastically contrasted from the period after 1965 Indo-Pak war when India faced arms embargoes. Now many countries are competing with each other to sell arms and licences.

In the last decade India has been in a position to produce an increasing percentage of its defence equipment indigenously. This has been achieved by activising one of the Third World's largest military-industrial-research complexes (MIRC). India's overall achievement in its MIRC has been very impressive and

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68 M. Wulf, "India, the Unfulfilled Quest for Self-Sufficiency", in M. Brzoska, and T. Ohlson (eds.), Arms Production in the Third World (London, 1986), p.127.

encouraging. India's MIRC has been able to design and build aircraft, it has assembled and manufactured helicopters, highly sophisticated jet fighters, produced tanks and armoured personnel carriers (APCs), built frigates, produced advanced electronic equipment and constructed missiles. The MIRC has enabled India to become self-sufficient in manufacturing a huge variety of small arms, medium artillery and ammunition.

The defence industry in India has succeeded in achieving a level of competence which in the long run has enabled it to buy technology to produce armaments under licence. However, it is true that the bulk of the production of defence units, the ordnance factories and defence public sector undertakings, are produced under licence, and the items produced indigenously have not been very many. 62.7 per cent of the weapons are manufactured under licensed production, another 24.6 per cent under licensed production with local modification, and finally, only 12 per cent of arms produced is based on indigenous know-how.

The military procurement and arms production patterns for India can be divided into four distinct phases: (a) outright but limited purchases from West European sources from the time of independent Statehood until the late 1950s; (b) increasing domestic design and licensed production of arms beginning in late 1950s/early 1960s; (c) growing domestic production with

heavy emphasis on Soviet weapons but without any major new projects during the 1970s; and (d) diversification of supply sources emphasising West European licence agreements parallel to continuing production of Soviet weapons since the late 1970s.[69]

Arms production facilities are government owned and the private sector's role is minimal. The private sector merely acts as suppliers of parts, materials and production machinery. The ordnance factories are divided into various groups, i.e.g., ammunition weapons, explosives, clothing and vehicles. Of course, these factories manufacture a great range of equipment like machine guns, small arms, ammunitions, explosives, vehicles, tanks, parachutes, rocket propellents, and combat clothing. The nine public sector undertakings produce highly sophisticated items such as helicopters, aircraft, missiles, electronics, frigates, mine-sweepers, and fast patrol boats.

Hindustan Aeronautics Limited (HAL) founded in 1940, basically to assist Allied war forces in World War II, is India's only aircraft manufacturer. HAL has over the years managed to assemble or produce over 2,300 aircraft. HAL has "factories spread over India with a turnover of around 3.3 billion rupees." Its products range from aircraft overhaul

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69 Ibid., p.128.

and repair to licensed production of engines, transports, trainers, helicopters and jet fighters. It has also succeeded in developing and designing its own aircraft and engines.

Bharat Electronics Limited (BEL) manufactures military electronics like communication equipment and radar. Also its production for civil use include television sets, semi-conductors integrated circuits.

The three shipyards-Mazagon Dock Limited (MDL), Garden Reach Shipbuilders & Engineers Limited (GRS&E) and Goa Shipyard Limited (GSL) manufacture a variety of ships. Two new shipyards — Hindustan Shipyard Limited at Vishakapatnam; and the Cochin Shipyards are involved in building ships for the Indian Navy. The Mazagon Dock Limited is one of India's principal producer of major ships, and it possesses facilities to produce submarines, patrol vessels and frigates.

Two new specialized companies are the latest addition to the defence sector undertakings. They are Bharat Dynamics Limited (BDL) set up in 1970 and Mishra Dhatu Nigam Limited (MDNL) founded in 1973 and entered production in 1983. It is a new high technology metal production factory which specializes in the manufacture of sophisticated metals and alloys for aircraft and missiles production, electronic and the nuclear programme.

Hindustan Aeronautic Limited is the only company totally involved in the production of aircraft. The Defence Development and Research Organization and the Bharat Electronics have assisted in the field of design, electronics and engines. HAL carries out the production of aircraft in three divisions: the Bangalore Division (the Kiran MK-2 and Jaguar); the Nasik Division (The MIG) and the Kanpur Division (DO-228, HPT-32 and the HS-748).

In 1956, India began a project for the licensed production of a light jet fighter and its power plant and the Orpheus 701 turbo-jet with the British firms Folland and Bristol-Siddley Aero-Engines. In 1959 the factory was set up and in 1961 production with imported components started. Orpheus 701 proved to be extremely effective during the 1965 Indo-Pak war. This resulted in an additional 200 orders. By 1971, 60 per cent of the engine and 85 per cent of the air frame were indigenously produced.[70] Many of the problems related to malfunctioning at low altitudes have been corrected in the modified Gnat Mark 1, the Ajeet. The design of this aircraft began in 1972 and the first model was delivered in 1975 but production was terminated in 1981.

Plans for an ambitious indigenous supersonic fighter were formulated and its development started in 1956 under the

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70 Graham, n.67, p.171.

West German direction. The first prototype of HF-24 Marut fighter was completed in 1961. There were many difficulties in finding an appropriate engine. The Orpheus 703 engine did not give Marut the supersonic speed and although India built some 25 airframes for use in Orpheus 12 the completion was conditional on its acceptance by NATO countries. It was, however, rejected by them and production was stopped.

Though India attempted to use the Soviet (RD 9-F) engine, it did not prove suitable. Finally, the project was thought to be highly ambitious and by mid-1960s, a high level committee headed by C. Subramaniam recommended the development of a successor to Marut. But HAL has not been able to develop a successful engine that can be used in modified models of the HF-24 Marut or in the follow-up aircraft, the HF-25 light combat aircraft.

Before the Indo-Chinese war in 1962, partly due to difficulties experienced with the HF-24 fighters, India started negotiating on agreement with Soviet Union for the manufacture of MIG-21 jets. After the war this project was dealt with much urgency and as a result the planners in India established a multiphased project to produce this aircraft. In the first phase was to assemble the MIG from imported components and the second was to manufacture some parts of the components for the aircraft and put it together along with the

imported one. The final phase was to use the locally manufactured components entirely. The project progressed very slowly and in 1970 the project was three years behind schedule. The production line for MIG-21 has been fully unlike the other divisions of the HAL. It is reported that about 60-70 per cent of the production is indigenous now. Though it has began producing MIG-21 parts from imported raw materials the goal is to produce most of the components from indigenous materials, such as aluminium, titanium and alloys.

The MIG project has proved to have had a positive impact on the HAL's design and production strategy. In this project HAL has adopted a phased approach to the acceptance of foreign technology. The three significantly different models of MIG-21 (MIG-21FL, MIG-21MF, and MIG-21bis) involve around 20 per cent modification on the previous models individually. India has been able to use the existing base besides obtaining new technology. Plans have been made for the production of the MIG-27, a ground attack/fighter and derivative of the basic MIG-23.

In the late 1984 MIG-27 entered service in India while it has been flown by the Soviet Air Force. India has tossed the idea of transfer of technology for making versions of the MIG-21 especially the MIG-29 and probably the MIG-31 which is still in the design stage.

India in its search for a new fighter in the 1970s, at least four possibilities were taken into consideration: an advanced version of the Soviet MIG-23, the Swedish Viggen and the Anglo-French Jaguar and the French Mirage. Because of high cost and delivery problems Mirage-2000 was initially rejected. Though the project of MIG-21 was progressing satisfactorily, finally in 1979 the British version of the Anglo-French Jaguar was to replace the Soviet MIG-23/27. In a revision of its earlier decision the Government of India signed an agreement in 1982 for the production of MIG-27 with the Soviet Union.

It was also decided that a batch of Mirage should be bought and an option to produce the plane under licence in India remained pending till 1984. The first units of Mirage arrived in India in July 1984. With various policy changes there are certain operational and co-ordination problems as regards the production of Jaguars, several MIG version and Mirage 2000. These problems will probably get more complicated if the plans for indigenous production of light combat aircraft is ratified by the government.

In order to meet the demands of the Air Force in the 1990s design work has begun for the production of a light combat aircraft. This programme has been put forward and advanced, as the Minister of Defence told Parliament, also to try to

"reinvigorate the aeronautical industry to a higher technological level."[71]

As far as the production of trainer and transport aircraft is concerned the results have been mixed in nature.

In the 1980s along with the production of fighters, both indigenous development of a trainer (The HJT-16 Kiran) and licensed production of a transport aircraft (the HS-784) were also started. The HTJ-16 Kiran, the jet trainer, first flew in 1964. This particular aircraft had only a limited success as it needed frequent repair. About 100 HTJ-10 Kiran Mark E and approximately 60 Mark II have been produced and fit with more powerful engines. Though HAL spent a considerable amount of time and money, it was unable to produce technology and design for indigenous aircraft.

Bharat Dynamic Limited (BDL) was set up in 1970 as a separate public sector undertaking for the design and manufacture of guided missiles. BDL through a licensed agreement with Aerospatiale (France) started an impressive programme forthe first generation of anti-tank guided missiles, which have entered service for many years. In order to arm MIG-21, the Soviet AA-2 Atoll air-to-air missile was

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71 Government of India, Ministry of Defence, Annual Report 1980-81, p.340.

manufactured in 1972. Also with the termination of the earlier programme BDL engaged in licensed production of Euromissile (West Germany/France) and Milan anti-tank missiles. Presently the Defence Research and Development Laboratories are involved in indigenous design and development of small, surface-to-air missile.

Until 1970s the domestic production of ships did not attract much attention, though as early as the 1950s orders for patrol boats and minesweepers, were placed. The Mazagon Docks Limited (MDL), and the Garden Reach Workshop Limited were acquired by the government in 1960. In 1966 the production of frigates started. MDL for the production of six Leander class firgate signed an agreement for licensed production with Britain. The last of the category frigate was completed in 1981 and is reported that it was almost entirely indigenously produced. For the supply of the main machinery and overall design West European know-how was incorporated. A new generation of Godavari class destroyers is being built, the first of which was commissioned by the Indian Navy at the end of 1983. It is a 'stretched' Leander frigate with integrated Soviet, Western and Indian systems and equipment.[72]

An agreement has been signed with West Germany Howaldtswerke Deutsche Werft AG (HDW) for licensed production of

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72 Wulf, n.68, p.139.

1500-ton submarines. Two submarines are to be imported from Federal Republic of Germany and two additional ships are to be manufactured in India. HDW has provided a substantial amount of technical assistance. Only recently construction has started and the first Indian-built submarine is expected to be delivered in 1987.

The naval programmes are a clear reflection of a changing Indian security perspective. When commissioning the first Godavari Class frigate, the Defence Minister drew attention to the "increased tension" in the Indian Ocean, the supply of sophisticated missiles to Pakistan for war ships, and the necessity of "costly counter-measures" for the Indian Navy.[73]

In the late 1950s with the initiation of major plans for the expansion of the air-craft industry, the production of tanks was also given consideration.

For the assessment of the possibilities of production of tanks under licence agreement a team of experts went to West Germany and Great Britain.

The Heavy Vehicle Factory was set up and an agreement for manufacture of 1000 units of modified Chieftan tanks signed with Britain. The first prototype was ready in 1963 and the first tank, "The Vijayanta" left the assembly line in 1965.

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73 Ibid., p.139.

All major components like engine, transmission suspension etc are produced domestically according to government sources.

In the early 1970s the research for a new generation of tanks started. A government Committee approved the request for funding for a future main battle tank (MBT). The project for the production of Cheetak, India's own main battle tank is moving smoothly. As the appropriate engine could not be found in the early stages of the project, it was decided to design indigenously and the first prototype was supplied in 1983.

On the other hand India has decided to stop production of the technically outdated Vijayanta and instead to licence produce the Soviet T-72 tanks at a factory at Avadi. The difficulties which the aircraft industry encountered are shared by the tank production sector.

A large range of ordnance, ammunition, small arms, mortars, explosives propellants vehicles and guns are produced at the ordnance factories with major portion of the components being indigenously produced. In case of small arms, some are of Indian design and some of West European designs. They include 9-mm FN-35 pistol, 7.62-mm LI-A1 rifle, 9-mm Sterling MK-4 sub-machine-gun, 7.62-mm Ishapore rifle and mortars.

Under the ammunition category 9-mm, 7.62-mm 303-in 12.7 mm high-energy propellant for MBT gun development is being manufactured in various ordnance factories.

India has been able to indigenously design non-metallic anti-tank mine and mine detection equipment.

Various vehicles are being produced with acquisition of licences from US, Japanese (Nissan), West German (MAN) and those developed at the combat vehicle Research and Development Establishment. They include jeeps, 3/4 ton truck "Shaktiman" (4x4) 5-ton truck and armoured personnel carrier.

Aden gun, 30-mm self-propelled gun, 75-mm pork gun/ howitzer Mk 1B, 105-mm field gun (2 models) and 120-mm field gun are manufactured in India. The growing domestic arms production is geared towards the goals of self-sufficiency. India's ordnance factories are basically self-sufficient in arms production up through medium artillery and these factories presently in a big way have managed to produce a large number of tanks and trucks.

The public sector undertakings have been able to produce a large number of jet fighters. The main shipyards also achieved much success with their production of frigates.

To date, India has not entered the export market to any great extent. Exports which include sale of small arms and

miscellaneous items, currently comprise only 1 per cent of total production and have never been greater then 2 per cent.[74] In 1983, the Indian Cabinet took a policy decision to promote exports, particularly to countries in the Third World, basically to strengthen its own arms production base by using under utilized capacities while at the same time improving India's trade balance.[75]

Helicopters, electronics, military vehicles, jeeps, light artillery, mortars and small arms are exported. The official export figures, given in the annual reports of the Ministry of Defence confirm this observation: for fiscal year 1981/82 about Rs.260 million have been reported.[76]

As part of military aid programme India has supplied patrol boats and helicopters on non-commercial terms to Nepal and Bangladesh. Also trainers have been exported (single pieces) to Burma, Thailand, Kampuchea and Malaysia. Seychelles has received helicopters. In 1983 the Soviet Union has bought eight Chetak helicopters along with associated equipment and spares. 50 Vijayanta tanks have been exported to Kuwait and has not been followed with additional sales.

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74 Graham, n.67, p.177.

75 International Defence Review, 12/1983.

76 Wulf, n.68, p.141.

India's potential for exports to the Third World States is rated very high. With the expansion and sophistication of its arms industry, India can capture the market in various friendly and nonaligned countries like Burma, Kampuchea, Malaysia, Jordan, Nigeria and Oman. It is important to emphasize that in the past the above mentioned countries of Asia and Africa have relied on India for arms supply. They have been supplied with Indian made small arms, ammunition and non-armed vehicles. There are greater chances in future considering the suitability of Indian arms to their defence needs.

Table II
INDIA'S ARMS EXPORTS (1973-1983)

Year	Value of Arms Export in million dollars
1973	-
1974	10
1975	20
1976	10
1977	50
1978	30
1979	30
1980	30
1981	20
1982	10
1983	-

Source: US State Department, quoted in Strategic Digest (New Delhi), vol.xv, no.11, November 1985, p.1434.

CONCEPT OF SELF-RELIANCE : IMPERATIVES FOR ARMS PRODUCTION AND EXPORT

Chapter III

CONCEPT OF SELF-RELIANCE: IMPERATIVES FOR ARMS PRODUCTION AND EXPORT

This chapter deals with motivations for domestic arms production in the Third World and its associated problems. It aims to highlight the different approaches adopted by various States of the Third World for achieving the goals of self-reliance, political and economic independence.

National defence is a legitimate concern of any nation and given the three-fold increase in the number of sovereign States since World War II, the emergence of security anxieties and a rise in military expenditures in the Third World had to be expected.[1] The emergence of a second tier of arms producers in the non-industrialized regions is a manifestation of the above anxieties. Many Third World countries like Brazil, India, Argentina, China, South Korea, Israel, Singapore, Malaysia, Indonesia etc., have gone for indigenous arms production with their ultimate goals being arms exports for various reasons.

The incentives generating the drive toward increased defence production in the Third World include security, economic and political concerns. Underlying all other motives, however,

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1 Thee Marek, "Third World Armaments: Structure and Dynamics", Bulletin of Peace Proposals, vol.13, no.2, 1982, p.11.

is the desire to eliminate, or at least greatly reduce dependence on industrial countries for arms deemed vital for national security. Indigenous defence production is an expression of self-reliance, and thus, it is a means of reducing a State's vulnerability to military and political pressures during times of crisis.[2] The US embargoes on arms to the Asian sub-continent during the Indo-Pak war of 1965 (Rann of Kutch Conflict) can be sighted as a good example in this respect. Also Israel a "Pariah State" has been motivated by arms embargoes which she has faced during both war and peace times.

The domestic production of military hardware in the Third World can be looked at from two angles. From one point of view the use of resources of capital, management, technical skills, imports and licences to manufacture certain items and high risk of investment necessary to develop sophisticated weapons can be regarded as a diversion of critically scarce resources available to the economy.[3] For example, Israel's defence expenditure absorbs some 32 per cent of the GNP. In fact, the

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2 Michael Moodie, "Defence Industries in the Third World: Problems and Promises" in S.G. Neuman and Robert E. Harkavy (eds.), Arms Transfers in the Modern World (New York, 1979), p.296.

3 Gavin Kennedy, The Military in the Third World, (Duck Worth, 1974), p.283.

current Israeli budget is composed of 1/3 debt; 1/3 defence; and 1/3 other government spending. Inflation, attributed in great part to Israel's defence expenditures, was estimated to be running at 160 per cent in 1980.[4] Also, India is among the poorest countries of the world in terms of per capita income. A substantial part of its budgeted investment, i.e., 60 per cent of 1983-84 Defence Budget (Rs.36 billion) was allocated for arms expenditure. This obviously can have an overriding effect on the state of the economy of India.

The other point of view would regard the establishment of a domestic industry as part of the programme, without which the country can not become independent politically. A defence industry helps to achieve the former -- it develops administrative skills in modern management and guarantees the latter.[5] For instance, in the case of Brazil, arms industry was considered an important ingredient for providing legistical and technological capabilities for national development.

The arguments presented by many Third World States go on to say that the higher costs of establishing a defence industry are no different from those of establishing any other

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4 Robert E. Harkavy, and S.G. Neuman, "Israel" in J.E. Katz (ed.), Arms Production in Developing Countries (Lexington, Massachusetts, 1984), p.211.

5 Kennedy, n.3, p.283.

sophisticated industry in a developing country. Furthermore, the presence of such an industry would ensure a growing measure of political independence since it is well known that the major arms suppliers of the world play an important role in influencing the policies of the recipient countries.[6]

In fulfilling the desires of freedom and acquiring of an indigenous arms production industry the Third World States go through various stages of developmental processes. Practically, all countries follow more or less a similar pattern. Each stage is characterized by increasing recipient participation. The various stages are as follows:

a) servicing and repair of imported weapon systems;
b) overhaul of imported weapon systems;
c) weapon system assembly under licence;
d) fabrication of simple components under licence;
e) co-production of weapon systems under licence; and
f) indigenous design and development.[7]

For some countries the drive toward self-reliance is generated by its charismatic leadership. This widely applies

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6 Rajesh K. Agarwal, Defence Production and Development, (London, 1978), p.15.

7 S.G. Neuman, "Arms Transfers, Indigenous Defence Production and Dependency: The Case of Iran", in Hossein Amir Sadeghi (ed.), The Security of the Persian Gulf, p.132.

to both India and Egypt. In India, the then Minister of Defence, Krishna Menon, formulated plans for self-reliant arms production in the late 1950s. Nehru believed that in a relatively brief period, India would develop into a great power that would not have to invest too much in its armed forces and its weaponry.[8] After the Sino-Indian and Indo-Pak conflicts the leadership in India too felt the necessity for an indigenous arms industry. Nasser of Egypt inspired the arms industry which basically aimed at providing political independence. Both in India and Egypt the nonaligned movement was thought to provide a shield against the effects of the Cold War. The expression of self-reliance in prominent Third World countries which later came together to form the nonaligned movement was in a sense to reduce its vulnerability to military and political pressures during its time of crisis. However, most of them at a relatively advanced stages of economic infrastructural development, countries like India, Egypt, Argentina (under Peron) believed that self-reliance when integrated with industrial infrastructure would lead to a two-fold benefit, i.e., research emanating industrial establishments would be

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8 K. Subramanyam, "Nehru's Concept of Indian Defence", The Institute for Defence Studies & Analyses Journal October 1982, pp.196-211.

mutually symbiotic.[9] The national leaders of these countries believed that it would secure for their countries a sense of security and independence of judgment in international affairs. Their attitudes were best echoed by the Brazilian Air Force Minister Joelmir Campos de Araripe Maredo in December 1977: "The time has come to free ourselves from the United States and the countries of Europe. It is a condition of security that each nation manufacture its own armaments."[10]

The nature of arms production in the developing countries is symptomatic of the type of government that a particular country has. The absence of any political base to a sitting government would naturally mean a dislocation of long-term armament production plans. More often than not, such governments would rather give up their attempted self-sufficiency

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9 a) India's MRC consists of 33 ordnance factories, 9 public sector undertakings, 34 research R&D centres, employing over 300,000 people. See, Thomas Graham, "India", in J.E. Katz (ed.), Arms Production in Developing Countires, p.157.

b) Egyptian arms industry administered through two separate organizations. The Arab Organization of Industries, and the Military Production Industries. Each having 9 and 16 factories working under them, and employees over 70,000.

10 This statement would also hold true for the seller arms exporters who try to buy influence through dependency namely, USSR and China. See, Washington Post, 18 December 1977, p.1.

to buy arms from a super power. A prominent example of this is Egypt under Anwar Sadat. The geopolitical considerations of the region made Sadat turn increasingly towards the United States from whom the most modern conventional arms largesse flowed. To substantiate this point Egypt since 1977 has cancelled Arab Organization of Industries (AOI) projects. The strategy that has been followed since then has been to allow an inflow of Western technology and armaments bought off the shelf, with the production of these weapons in Egypt taking a decidely second place.[11] An example of this would be the purchase of selected parts of Mirage 2000 which were earlier produced in Egypt but were now being imported from France.

However, the establishment of military dictatorships in various countries has brought about the opposite effect. A glaring example would be the case of Pakistan, in the nine years of military rule it has had under President Zia-ul-Haq. In the earlier periods the alternations between civilian and military rule led to no substantial arms production despite large doses of economic aid. The nine years of relative stability have seen Pakistan gearing itself up towards what has been called "a basic

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11 T. Ohlson and R. Varryuen, "Egypt: Arms Production in the Transnational Context", in Michael Brzoska and T. Ohlson (eds.), Arms Production in the Third World (London, 1986), pp.111-12.

needs oriented self-reliant approach."[12] This particular approach has been one way of sustaining a military dictatorship by giving the loaves to the army to prevent dissent. From a relatively modest indigenous programme between 1947 and 1977, the arms industry after 1977 has expanded to a nearly 14 ordnance factories, with an employment generation of 30,000 to 50,000 people and a turnover of $400 to $500 million. In addition to this the Air force and the Navy have separate establishments with Western collaborations.[13]

North Korea could be another example of how the type of government has promoted indigenous arms production. The threat to its security has always been there but the Communist totalitarianism has been able to propel the production of the armament industry to a very large extent. The five, six and seven year plans envisaged indigenous production of sophisticated equipment. Here arms production seems to have outgrown the rest of the industry in technological complexities.[14]

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12 M. Brzoska, "Other Countries: The Smaller Arms Producers", in Michael Brzoska and T. Ohlson (eds.), Arms Production in the Third World (London: 1986), p.268.

13 Ibid., pp.265-66.

14 Ibid., pp.260-61.

Almost all the major Third World arms producers are key actors in their respective regions. It is striking that they are also traditional rivals: Brazil-Argentina, India-Pakistan, Israel-Egypt. One of the primary impulses for arms production by these countries has been difficult security problems with instances of several conflicts. Thus regional instability plays an important role in stimulating arms production. First of all when a key actor in that area perceives an unacceptable balance between itself and a State in the region which is considered a possible threat, it takes action to rectify this perceived imbalance. This they prefer doing through indigenous production rather than having links with super powers. The reasons for this thinking is fairly simple. It is to avoid any kind of pressure on its own action which is detrimental to its national interest, which inevitably comes about when arms are given. Also, in such situations a successful indigenous arms industry is perceived as an important component of national power. Failure to improve its capability militarily would amount to a significant blow to national prestige. Examples of such cases are the continuum of the arms spiral between India and Pakistan, and Israel and its West Asian Arab neighbours.

In some cases where an actor has no specific rival, political conflicts are used to generate a perceived need

to enhance national security. By extension it means defence industries are kept alive by potential or active conflicts.[15]

Another factor of prime importance in the search for indigenization has been the politico-economic constraints that are imposed by the supplier on the recipient. Thus, self-reliance in the policies of some countries takes the form of economic independence. Prominent among them is the case of Israel which has attempted to use the State's modernization process to develop and manufacture weapon systems which it can also export. The obvious benefits of the Brazilian policy have been that arms exports mean subsidizing their own weapons procurement programme. Also it means creation of foreign exchange earnings and savings which help to keep the nation abreast of current technology. With increased R&D Brazil has been able to develop important skills for its work force, carve out a niche for itself in the business of intermediate armament technology and politically use export of such weapons and machines to exert and dominate its neighbours in Latin America and gain influence in Sub-Saharan Africa.

Another unique feature about Brazil's arms exports has been the integration of its economic contents with foreign

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15 Moodie, n.2, pp.305-306.

policy objectives. With the tripling of oil prices in the 70s a new direction was given to Brazilian arms export. And "oil for arms" policy followed and it quickly disassociated itself from US foreign policy to get market for Brazilian arms and show that supplies were not vulnerable to US pressures. A case in point is Brazilian arms supply to Libya despite severe US pressure on Brazil.[16] Another important aspect that contributed to Brazil's arms exports has been the IMF's insistence that Brazil exports in order to stabilize the highly inflationary economy. Arms exports became important in this attempt. However, two constraints might in the long run affect Brazilian exports. As the number of client States increases, the Brazilians will be forced with contradictions in the pursuit of foreign policy goals. Secondly, the military has gained from a certain rapprochment with the US and other Western nations in respect of better access to military technology. Given the fast changing levels of technology, Brazil would have to intensify its own R&D for the succeeding generations of weapon systems if it proposes to relate its economic factors with foreign policy goals.[17]

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16 P. Lock, "Brazil: Arms for Export", in M. Brzoska and T. Ohlson (eds.), Arms Production in the Third World (London, 1986), p.97.

17 A. Witcey, "Brazil's Defence Industry raises doubts over US Pact", Financial Times (London), 21 February 1984.

Thus we find that the whole issue of arms production and export by Third World countries is embedded in the complex network of international relations. East-West competition with regard to military strategies in regional and sub-regional conflicts makes Third World countries ambitious to indigenize weapons production.

Another motive which on its own and also combined with full advantages results in Third World countries striving for indigenization, is the economic motive. Classic examples of this motive are Brazil and Egypt.

On a more general level, arms production really needs no special justification. It is a more or less accepted activity in industrialized countries and linked to general industrialization. The same is becoming increasingly true of Third World States.

What ails Third World Arms Production?

With the spread of armaments and its related technologies, there has also been a horizontal spread in the attempt by a large majority of nations to indigenize arms production and create an infrastructure that would do away with dependence from traditional suppliers. By the early 1980s there were 54 countries ranging from goliaths like China to Singapore. More interestingly, countries of every hue of political system and levels of industrialization are participating in

such ceaseless quests for self-reliance.

However, these attempts at indigenization have proved more of a mirage with a few tangible developments in some countries. Among the most important difficulties which stare Third World nations are the lack of a fulfledged technological base. By this, we mean the absence of diversifications of the industrial base, the small sizes of skilled manpower and low levels of R&D facilities and output.[18]

The arms industries in most of the Third World countries are conspicuous by not having any kind of link with the technological know-how of the civilian industry. Either of them can not be mutually exclusive of each other. Glaring failures of this compartmentalized ways towards arms production have been the dismal features of Argentina in the 1950s, Egypt in the 1960s and Peru in the 1980s. This vital fact also shows why countries like Libya and Saudi Arabia despite having enormous financial capabilities have not gone in for production of weapon systems which far exceed their general technological base. Saudi Arabia produces only simple technology items like ammunition and small arms.[19]

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18 Brzoska Mand T. Ohlson, "Conclusion" in M. Brzoska and T. Ohlson (eds.), Arms Production in the Third World (London, 1986), p.280.

19 SIPRI, Annual Arms Production Register, 1982, p.464.

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19 SIPRI, Annual Arms Production Register, 1982, p.464.

Another difficulty which is perceived by most Third World countries is the limited size of the markets. Here the problems arise on account of two factors, one is the cause and the other a consequence. Firstly, the cause for the limited markets is due to the restrictive policies followed by traditional suppliers not allowing Third World exporters to compete in the international market. This, they are able to achieve by not allowing exports of weapons systems made under licence. An example of this restrictive approach is the Indian built MIG-21 which while being produced in India, was disallowed by the Soviet Union to be exported to other countries, notably to Egypt.[20] Given the present situation of the Third World arms production, over 60 per cent of it is made under licence. This is exploited by the traditional suppliers to use their military technology as an instrument of foreign policy. Secondly, the consequence of this has been that whatever the Third World arms producers manufacture and export is usually indigenous design and production. The cost over-runs are much higher than in developed countries. Therefore, there are some countries like Mexico, who realising that the per unit cost being unfavourable, prefer to keep military expenditure to GDP ratio at the very minimum.[21]

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20 Graham, n.11, p.172.

21 SIPRI, World Armaments and Disarmament, SIPRI Year Book (London, 1982), p.462.

Other reasons for limited markets for Third World countries have been the tremendous spurt by European countries to step in as suppliers. Important among these are Belgium, Federal Republic of Germany, Britain and Italy.

The whole policy nowadays seems to be not to lose a customer to a competitor and use export of production technology to maintain political influence. This they are able to do through greater efficiency, lower costs and consequently cheaper products. Only a few Third World countries like Singapore, Malaysia and Philippines have been able to overcome international market competition and promote their items of low technology weapon systems.[22]

A Third factor which afflicts almost all Third World nations is the lack of financial resources. Since most of the armament industries are State-run, they are subsidised. With scarce resources there can not be massive infusion of funds to a particular industry. The result of this is that inadequate allocation leads to more time to develop the same weapon. This delay increases its price making it per unitwise uneconomical. Many a time intended projects never take off the drawing boards which results in a complete waste of the

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22 See Ohlson, n.11, for further details see list of export by Singapore, pp.55-74.

allocations made. Examples are in India. The development of the main battle tank has been stalled for a number of years resulting in steep cost over-runs. The Indian project of light combat aircraft (LCA) is also running into similar trouble.

Another constraint is the absence of any co-relation between the civilian and military industries. In most of the Third World countries the levels of technology are quite low. But given the security mania, desiring to produce armaments the technological sophistry is far in excess of the existing technological levels in these countries. This leads to many shortages in the manufacture of the parts and availability of skilled manpower. The result is that practically all arms parts have to be either imported or made under licence, increasing the per unit cost of the finished product. This becomes a major disincentive for Third World nations. Countries having a sufficiently advanced technological base like South Korea, Singapore, India, and Egypt would be in a position to derive benefits from research in either field for indigenous development of the weapons.

A natural corollary to this problem is the import of foreign technology. This becomes a self-defeating act because the very purpose of domestic arms production is defeated.

A new dependency is created. A prominent example of this dilemma is Libya which is proposing to manufacture aircraft in collaboration with Italy where almost all parts would be imported. This creates a dependency on Italy vis-a-vis-Libya.

Emanating from this restrictive policies of the major suppliers is the leverage used by them to control export of such parts which are critically important to weapon systems but also at the same time bring invaluable civilian benefits. For example, the almost impossible sale of super computers from the United States to India, its civilian uses are enormous but military applications are equally important. The decision to give India these computers was taken at the highest political levels with assurances that India would not pass on the technology to the Eastern bloc. Such rigid controls are considered by most Third World countries to be highly discriminatory. Such technology is used to gain political leverage. An example of this being the supply of modern technology to Iran at a time when the Shah was cultivating the Soviet Union.[23]

The technology and politics apart, the economies of weapons development and manufacture are also important

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23 Brzoska and Ohlson, n.18, p.287.

constraints on Third World countries. Most Third World economies are preponderantly primary product producing units. The result of this is a highly volatile economy which is subject to fluctuations in the international market. The periodic cycles of booms and depressions hinder a continuous, uninterrupted development of a weapons programme. Classic example of this would be Argentina which despite being enormously rich in natural resources is today "a country paralysed and on the brink of bankruptcy."[24] The economy on the verge of collapse is assulted by heavy foreign debt, low productivity and rapid inflation. All this has led to strikes and demonstrations hurting the economy to the extent that the present President Raul Alfonsin, has taken steps to reduce the military's power and bring austerity to the economy. Even work-force of the vast Fabricaciones Militario Industry (FMI) is proposed to be reduced considerably. This would cut Argentina's military production and affect its sales abroad.[25]

A depressive and fluctuative economy brings with it two attendants namely, inflation and lower levels of efficiency. In countries like Israel and Argentina inflation is a way of life. The Shekel and Peso have upward spirals up to over 500 per cent. The result of this is that real wages come

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24 Financial Times, 23 June 1982, p.1.

25 The Economist, December 17, 1983, p.32.

down, unemployment rises and the economy can not afford the luxury of subsidizing military weapon development programmes.[26]

Even in countries other than those hit by inflation, the general levels of efficiency are much lower than the developed world. A plausible reason for this could be that the Third World countries attempt to use weapon manufacture as ways and means of generating employment which reduces efficiency. Countries like Pakistan and India which approach the employment problem in this manner tend to get low productivity which hampers their long-term goals.[27]

Another point affecting Third World countries in their search for more markets is the failure to keep delivery schedules and creating an overall marketing plan to serve their long-term interests. Delayed deliveries are primarily due to absence of trained labour, inadequate technical facilities and insufficient administrative skills. There is a lack of focus on this overall marketing strategy which results in delayed products, more expensive and more importantly resulting in loss of credibility. Example of this

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26 Washington Post, 25 November 1982.

27 Daily Nawa-Waqt (Lahore), 21 June 1974.

could be India's failure to keep production schedules of Vijayanta tanks.[28]

Other minor difficulties which come in the way of more precise development and production of weapons are the lack of co-ordination between the armed forces and the bureaucracy on the particular needs to defend the country. Inter-elite rivalries have led to wrong focusing when better and more effective alternatives are available. To overcome such problems, there will have to be long term strategy, correctly identifying the nation's needs for its own security and exports. Poor reputation is another significant obstacle in the development of overseas markets by Third World States. The weapons may be suited to one environment but could be miserable failures in another. An example to prove the point is the failure of North Korean weapon systems in the countries to which they have been exported.[29]

Finally, what underlines all these obstacles is the lack of political continuity in the leadership of the Third World States. All weapons systems have a long gestation period between conception and manufacture. To carry out this long and tedious process would require a relatively stable

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28 Graham, n.9, p.174.

29 Edward A. Olsen, "North Korea" in J.E. Katz (ed.), Arms Production in Developing Countires (Lexington, Mass., 1984), p.240.

political leadership which is not there in contemporary Third World countries. The Shah of Iran was assidously building up the country's arms infrastructure through a number of collaborations. However, with his downfall in 1979, and the resulting chaos all these agreements were discontinued by the Khomeni regime whose perceptions and long term objectives are diametrically opposite to Shah. This has resulted in wasteful expenditure.[30]

Make or Buy

Given these difficulties that the Third World countries face in their quest for manufacturing arms, it becomes important to inquire whether in the first place such countries should produce arms and secondly to determine what stages of development would the countries have to be in to produce indigenously. Experts are of conflicting opinion on the nature of domestic production of military hardware.

There is a widely held view in the whole scenario of "Defence v/s Development" according to which increased arms production takes away scarce resources from social and economic development. Almost all the Third World countries are of this view that increased arms production leads to tensions in the region requiring higher levels of armament.

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30 Moodie, n.2, p.302.

This, they feel, takes away money which could be well spent on other vital areas. The entire debate of New International Economic Order (NIEO) is an expression of the Third World State's belief.[31]

However, on the other side of the spectrum are those experts mostly from the developed world who see no redistribution of wealth from social and economic development to arms. They view military expenditure and social and economic expenditure as co-terminus. This linkage was best optimized by Robert McNamara's statement "Security is development and Development is Security".[32]

To these experts, defence is a necessary pre-condition for economic development.

The main problems that the developing countries face are that they are all in very different stages of their political, military and economic evolution. Therefore, the decision to manufacture armaments or buy them outright becomes extremely confusing. A sizeable section of the experts feel that from

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31 United Nations General Assembly, 36th session, study on relationship between development and disarmament, New York, UN Secretariat, 1981, December. A/36/356.

Also see arguments in the various volumes of the UN Disarmament Year Books, 1976-80.

32 Robert McNamara, The Essense of Security (New York, 1968), p.149.

the point of view of the use of resources, capital, management, technical skills and other high risk investments it is a diversion of the critically scarce resources available to the economy. They feel the whole exercise is wasteful and many urgent human problems could be solved with the money needed to build such weapons.[33]

The other point of view holds that the establishment of a domestic industry as part of its long-term development programme is imperative for the country to become independent politically. Not only national military force is a symbol of sovereignty and independence, but also more important as they are reliable in that they will defend national interest as defined by national leadership.[34]

These experts perceive that the growth of the defence industry helps to develop administrative skills in modern management. The newly independent countries (NICS) are sensitive to what they regard as continuing dependence on metropolitan powers.

Other potential benefits which accrue from a growing

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33 UN Document: Debate on Social Consequences of Disarmament (New York, 1982), p.12.

34 Bruce Arlinghaus, "Social Versus Military Development: Positive and Normative Dimensions" in J.E. Katz (ed.), Arms Production in Developing Countries (Lexington, Massachusetts, 1984), p.42.

military industrial capability are that it provides employment to a large number of men, creates an internal market for necessary items for the well being of the uniformed men. It also raises the training and supervision capabilities apart from providing a substantial market for repair and manufacture of simple arms.

Another ground on which they argue for an arms industry is that military security is of paramount importance and production of weapons can be effectively protected from competition of the kind which local consumable articles face. Even the research and development programme which could be passed over to the civilian sectors of the economy are benefitted. In the quest for self-sufficiency large amounts could be spent by the government on R&D which if exposed to local competition would not have had sufficient amount, with the project finally being given up.[35]

A sizeable number of experts feel that from economic-political angles arms production in Third Wourld countries does not solve all problems of national security. Firstly, self-sufficiency as is understood is not complete in the Third World nations. Except for small arms and ammunition the rest of the major weapon systems are either produced under licence or even if it is indigenized, critically

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35 Kennedy, n.3, pp.292-93.

important parts have still to be imported. Examples of this are the Israeli Kfir fighters, India's Vijayanta tanks and Gnat aircraft which are either getting their air frames or engines from developed world.[36] So here the restrictive factor of the super powers is still in operation. This can always be used to gain leverage with these countries. So self-sufficiency becomes more of a misnomer.[37]

From the economic stand point they feel that the claim in the military circles in the LDCs that weapons production would be a spur to the economy and raise its levels of productivity has not happened in actuality. The main economic problems are the shortage of foreign exchange, high and rising levels of unemployment with extremes of poverty and affluence, dependence on imports of machinery, raw materials, technology and the scarcity of capital resources. Furthermore, setting up of such industries would not solve the other ills that the LDCs feel in general. They would instead be an intolerable burden on already scarce resources.

The experiences of many countries have clearly shown that it takes many years, indeed, decades, to reach the highest stage of indigenous military production. Countries like India, Israel and Argentina have been determined practioners of the

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36 Ibid., 232.

37 Ron Ayres, Link (New Delhi), 20 February 1983, pp.27-33.

art of self-reliance still they have not been able to overcome reliance on technology, and raw material from the developed world. Thus, theonly alternative that countries opt for domestic arms production, is that in order to survive the high capital cost and operate economically they must seek export market even if it is for small arms and ammunition to lower the individual end item cost of their armed forces. This continuing proliferation would lead to extreme competition but it would have some salutary effects on the nature of the political relationships between countries, between the LDCs and the developed world, giving more leverage in international fora.[38]

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38 Arlinghaus, n.34, p.42.

SECURITY VERSUS ARMS EXPORT: QUESTION OF STABILITY

Chapter IV

SECURITY VERSUS ARMS EXPORT: QUESTION OF STABILITY

With the proliferation of countries indigenously manufacturing items either under licence or indigenously developed product, the international security system is undergoing profound changes. There have been differences of opinion as to whether this gradual expansion of military production capabilities by the Third World countries has made the international system more stable or unstable. This chapter intends to analyse the question of stability by keeping in view four major issues: (1) the impact of indigenous defence production within the country engaged in the process; (2) its implications for the security of the arms producer's regions; (3) the impact of arms exports by Third World arms producers into the areas of potential conflict; and (4) implicatiohs for efforts designed to achieve arms control at the conventional level.[1]

The primary purpose of most Third World arms industries is to enhance its national security. It has been a common belief that indigenous defence production facilities are meant to reduce the vulnerability of a State to political and military pressures from others. However, this primary motive

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1 Michael Moodie, "Defence Industries in Third World: Problems and Promises" in S.L. Neuman and Robert E. Harkavy (eds.), Arms Transfers in the Modern World (New York, 1979), p.299.

in itself is not free from dependence on major powers, thereby diluting the primary motive. Another argument put forward is that domestic production would mean specifically meeting the indigenous requirements of armed forces. As the survey of major Third World countries exporting arms shows, most of the technology that is used is in collaboration with a major power or even under licenced production. Hence the dependence on critical parts still remains. Except for countries like Brazil, South Africa, Israel and India where modest attempts to make low technology conventional armaments have had some success, and other countries efforts have been very negligible. Thus, the concept of dependence has undergone changes from out right sale of weapons to the Third World countries to supplying critical parts in maintaining dependency. As the International Institute for Strategic Studies noted: "the transfer of technology for producing weapons is... as important a phenomenon as the transfer of weapons themselves."[2] Thus, the dependence of Third World countries on industrialized States for weapons has evolved into a dependence on those States for the technology to build weapons. Two conspicuous examples come to mind: the Israeli production of Chariot, a 56 ton tank, which imports its engine from the United States.[3]

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2 International Institute of Strategic Studies, Strategic Survey (London, 1977), p.21.

3 The Times (London), 16 May 1977.

The other example is of the Indian Vijayanta tank which began indigenous production in 1965, and still imports the power plant from Britain.[4] These two examples show that despite claims of indigenization essential parts are still in the control of the original supplier nations. Technological innovation will continue to be led by the industrialized countries.

Developing countries will not be able to match the vast sum spent on R&D, and would constantly try to catch up in many areas of advanced technology. This is not to suggest that the technical lag would remain in all spheres. A Third World country could achieve a level of sophistication in a particular sphere. A case in point is Israel's electronic industry which has been able to perfect airborne avionics and radar almost to the level of sophistication that is found anywhere in the world.[5]

Another reason for dependence on developed nation's know-how is because of the rapid turnover of R&D innovation which render most weapons ineffective within a short period. Given the high costs involved in manufacturing high technology items, the Third World countries would not be in a position to

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4 Peter Lock, and M. Wulf, Register of Arms Production in Developing Countries (Hamburg, 1977), p.95.

5 "Tadiran enters Airborne Avionics Field", Aviation Week and Space Technology, 24 April 1978.

integrate such changes in a rapid turnover. The result is that they have to depend on developed countries for supply of armaments.

Another dimension of dependence by the Third World producers is the requirements for assistance in training and support. Imported personnel have been vital to the success of the indigenous arms industries from the outside. Brazil, India, and Israel have depended on foreigners in the early years for setting up their industries.[6]

Another attendent dependency concerns infrastructure. To quote Sir Ronald Ellis, Head of Britain's Defence Sale Organization, "the real big money is coming from military projects — runaways, hangers, laboratories, hospitals, arms factories and repair shops."[7]

The pattern of Third World military imports has shifted increasingly from finished weapon systems to military technology and infrastructure. This has changed the nature of Third World susceptibilities. What we witness now in most

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6 Pushpinder Chopra, "Spinal Cord of Indian Air Defence", Air International, January 1975. Also see, Irving Cohen, "Arova: Israel's first born bid for world market", Air Enthusiast International, February 1974.

7 Quoted in Lawrence Freedman, "Britain in the Arms Trade, International Affairs (London, 1978), p.54.

Third World arms producing countries is that short-term vulnerability to external pressure has decreased, in crisis or actual hostilities. However, this dependence has manifested itself on a long term basis. With more and more countries going in for domestic production under licence or in collaboration, there is a feeling that this could give the supplying company more reason to exert greater influence and control on the Third World producers. This would happen to keep the on-going collaboration for longer periods and secondly the Western private companies could be used by the Western governments to pressure Third World States.[8] More and more Third World States are trying to develop their own national industries in a perceived need for self-reliance. In this way they could reduce the degree of dependence and allow for greater flexibility in their foreign policies. Countries like Egypt, Somalia, Israel and Turkey are examples of States paying the heavy price to avoid their dependence for arms and technology which in turn strongly influences their foreign policies.

Sometimes there are attempts made by Third World nations to produce armaments and weapons which are not appropriate for their environment. These weapons could easily be bought

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8 Moodie, n.1, p.303.

off the shelf in Western countries without political strings. There are several reasons for this: first, the range of weapons systems, traditional arms manufacturers have put up for sale has expanded because those producers especially in Europe, must export to maintain the health of their own defence industries. The Third World is the most attractive export market and systems are now being developed for it by the Europeans. Secondly, prestige considerations have sometimes pushed a Third World State beyond its capabilities and the resulting systems have proved inadequate. Prestige has made some of these States to develop systems indigenously when equally good or better systems were available elsewhere. Two examples being Brazil's development of maritime version of the Bandeirante reconnaisance aircraft when several systems were available in Europe which were cheaper and more advanced. The second example is of the Indian field gun mark II which is a modification of the British version of World War II vintage. Thirdly, the developing States with relatively more advanced arms industries are approaching a stage at which the nature of weapons strongly influence precepts of national security.

Hence we find that while Third World States have been able to increase their arms production and diversify into various products, their small research and development base and higher costs have created another kind of dependence on the

Western suppliers -- long-term technological dependence. In turn the Western countries have been able to produce weapons that suit Third World environments. This important observation would have a significant bearing on the nation's perception of security.

Another myth that has been put forward by the Western experts is that arms exports by the Third World countries could cause regional instability. They point out to the major Third World arms exporters like Brazil, Argentina, India, Pakistan, Israel and Egypt which are situated in areas of tension and are traditional rivals. Regional instability is found when a key actor in an area perceiving an unacceptable balance between itself and its adversary undertakes methods to rectify the balance. The nature and volume of Third World arms exports is so little and meagre that infusion of weapons produced by them into an area of tension would not alter the balance qualitatively. Instead, what destablizes regional security is the geopolitical ambitions of the major powers who through inter-continental missiles, basing of troops in foreign lands and reacting to the other's technological advances sucks smaller nations into the vortex of international tension and conflict. Examples of these could be Iran, Pakistan, India.[9] Diego

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9 E.A. Kolodiez, and R. Harkavy, Security Policies of Developing Countries (Lexington, Mass., 1982), p.333.

Garcia and countries located astride, the important maritime choke points like Oman, Somalia, South Yemen, Indonesia have received increased attention as "strategic Pawns."[10] These nations along with larger developing countries became objects of big power attention, which affects their security strategies. This gives them leverage for arms acquisitions and the use of their territories becomes a quid pro-quo for assistance against regional competitors. It has increased their vulnerability and made them play a role in the super power strategy of regional security arrangements.

Another factor that causes regional instability borne out of super power involvements, is the location, which defines the nature and level of conventional military threat with antagonists. Thus the induction of super power rivalry into such areas paves the way for negative regional imbalances. Examples are Israel, South Africa, Pakistan, South Korea.[11]

Thus local tensions, antagonisms, and prejudices are given a boost with the induction of these States into regional security arrangements managed by the super powers. Historical and religious differences are excerbated with the

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10 Jeffery Kemp, "The New Strategic MaP", Survival (London), March-April 1977.

11 Robert E. Harkavy, "Pariah States in Nuclear Proliferation", International Organization (New York), no.1, Winter, 1981, p.135.

introduction of advanced technology weapons. An example of this is the Iran-Iraq war and Israeli-Arab war. As Robert Harkavy has commented: the "Accent should not obscure the pervasive reach of Moscow and Washington, and their impact on the security behaviours of lesser States. The larger point is that neither the smaller States nor the larger States have control of either bilateral security struggles or of regional conflicts else where..."[12]

Other factors that cause regional instability is where arms manufacturers are also traditional rivals. Their build-up of indigenous defence capabilities might be viewed as a novel dimension of their arms race, examples being India and Pakistan. Also in areas where the arms producer has no specific rival, local arms production is the product of political conflicts which generate a perceived need to enhance national security.[13]

More often than not, it is the defence industries which are kept alive by potential or active conflicts since regional disputes are threats to national security and they have to be countered by locally produced arms. An example of this situation would be Israel. In some cases the existence of a local arms industry could exacerbate a conflict by contributing

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12 Kolodiez, and Harkavy, n.9, p.345.

13 Moodie, n.1, p.306.

to the over bearing confidence on the part of one side. As Michael Moodie in his article has noted: "Not all threats to regional stability in the Third World ... stem from disputes between governments. Unrest within a key developing country can easily spill over to affect the power balance of an entire area."[14] His implication in such a regional instability is clear; change or unrest in a key country is usually backed by a super power. When this change takes place, the power equilibrium changes, setting into motion instability between States. An example of super power intervention to affect the existing balance of power is the case of Afghanistan.

Economically, the export of arms by Third World nations to various countries has been perceived by the West as the most dangerous and potentially destabilizing element. The value of Third World production has been increasing steadily from about $10 million in 1950 to $1200 million in the year 1984 and the exports have risen from $1 million in 1970 to $250 million in 1984 (in constant 1975 prices).[15] Though the value of goods between 1974 and 1984 has increased ten-fold, Third World arms exports are still very modest. They account for as little as 1.5 per cent of the total world exports for the period 1980-84. At current prices, Brazil is

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14 Ibid., p.306.

15 M. Brzoska and T. Ohlson, Arms Production in the Third World (London, 1986), pp.29-31.

reported to be exporting approximately $2 billion a year.[16] Increasingly over the years more and more countries are beginning to export armaments in a large way. Most Third World arms producers share the opinion of an Israeli Defence Ministry spokesman who argued that "it is impossible for a small country to maintain an economically viable arms industry without exports."[17]

Thus the domestic market being so small an arms industry could only support itself and achieve economies of scale through Third World exports. It has also been found that politically the influence of arms exports has only a limited amount of success. What counts most importantly in the longer-run is the economies of arms sales. China going through an ideological funfare pursued this policy of arms exports for political gains. It has resulted in modest success despite the fact that the weapons and ammunition were supplied at "friendship rates". The political leverage that China was able to get through its exports to countries like Pakistan, Tanzania, Vietnam etc., could be cohsidered modest at best. This has prompted to rethink their strategy of arms exports in the course of its four modernization. A Chinese official's

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16 Financial Times, 20 December 1985.

17 G. Robinson, "Israel Arms Exports Spur Concern", Aviation Week and Space Technology (Washington), 13 December 1976.

statement best sums up the Chinese dilemma and panacea when talked about his country's new and more hard headed arms sales policy: "we can not sell at friendship prices all the time."[18]

Given the rising trends in the exports by the Third World countries the developed and traditional suppliers will encounter competition. Most of the European countries have been able to maintain the health of their defence industries through exports. With the addition of new members into an already over crowded market the competition would have an adverse long-term impact on European industries. Understanding this dilemma the European suppliers have placed more emphasis on technological and technical transfers, creating dependencies. The fear of this competition being moved into licensing agreements and the state of the art of technology transfers has made the Western experts put forward a thesis that arms transfers from the Third World would be a cause for instability. As it has been pointed earlier, the total volume of arms exports from the Third World is so minimal that could not profoundly affect regional stability to such an extent as the Western experts make us believe.[19]

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18 Anne Gilks, and Gerald Segal, China and Arms Trade (London, 1985), p.10.

19 For a summary of Western thought, see, Colin S. Gray, The Geopolitics of the Nuclear Era (New York, 1977).

Another damaging spectre that is presented with regard to Third World arms export, is that conventional arms control would have no meaning. The fallacy of this argument is that most of the arms production that takes place in the traditional supplier countries and in the Third World is made with Western technology. Therefore, if the proliferation of the conventional arms has to be stopped it would have to begin with the major suppliers themselves.

All these scenarios are created because the traditional suppliers are becoming increasingly aware that it will be "difficult to exert control as regional arms production capabilities expand."[20] It is the dilution of their political influence and economic gains that make the traditional suppliers want to restrict Third World arms exports by raising the bogey of regional instability.

Over a period of time the Western countries realise that if Third World exporters are able to export beyond their immediate regions, their political influence would be far more deeply engaged in international affairs. As an Israeli spokesman has commented on Brazil's arms sales to Arab

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20 Moodie, n.1, p.308.

countries, Brazil will de facto enter the arms race in the Middle East "and may even exert influence on the armament balance of the region."[21]

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21 Quoted in Brazilian Newspaper O Estad de Sao Paulo, cited by FBIS, Latin America, 15 April 1977.

CONCLUSION

Chapter V

CONCLUSION

The entire process of arms production and its subsequent export by Third World countries should be considered as an integral part of the complex network of international relations. The process of arms production in Third World countries has increased dramatically in the decade 1970-80. The graphs have shown a sharp increase in the total volume of production of armaments. In the year 1984 the value of such production was estimated at $12,700 million at 1975 constant prices.[1]

The drive towards self-reliance in arms production and the attempt for exporting them should be seen in the wider context of global relations particularly the recurrent East-West competition as expressed in military blocs, military strategies, regional and sub-regional problems and conflicts and the dependency patterns that have emerged as a result of this competition.

The dependency patterns which have held Third World countries hostage to major arms suppliers have created political problems. Economic instabilities have led these countries' compromising their vital national interests, so

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1 Michael Brzoska, and Thomas Ohlson, Arms Production in the Third World (London, 1986), p.8.

as to secure a consistent supply of armaments for their national defence. Thus the primary motive for this burgeoning arms bazaar which is mostly made up of emergent Third World States is to reduce political dependence on unpredictable and unreliable outside suppliers. The Indian decision for self-reliance is an example of a Third World country trying to breakout of the shackles imposed upon it by its major suppliers in the pre-1963 period. The South African efforts had a similar impulse which was caused by the UN embargo of 1963.

Political isolation is also another major factor in Third World countries developing their domestic armament base. Examples of these are South Africa, Israel and Chile after it was internationally ostracized after the overthrow of Salvador Allende in 1974. South Korea and Taiwan fall into the same category as possibilities of a drop in American commitments made them perceive a role for their own industries and building up adequate national defence.

A survey of major Third World arms manufacturers and exporters would show that most of the countries that have developed strong indigenous arms base and significantly increasing their arms exports are major regional actors like China, India, Egypt, Brazil and Argentina. The quest for prestige has also made these countries and other countries like Iran to go in for major weapon producing programmes.

The survey of weapons producing countries also shows that the dominant motive is to reduce political dependence on traditional supplies.

Another motive that seems to be gaining ascedency is economic. Though the level of technology in the arms exported is low, they have, nevertheless, been able to make significant inroads in the traditional supplier's market. Countries like Egypt and most notably Brazil which after acquiring an independent technology base and self-sufficiency have moved into exports to various countries in the Third World for economic gain.

They alongwith other countries like Malaysia, Singapore, South Korea have followed the Western models of production and are using exports as a way of subsidizing their domestic high cost of production. Another feature that has been marked is the growing collaborations between Third World countries and multinational companies for production of small arms and ammunition that have increasingly been exported to Third World nations.

As a rule, in most Third World countries political imperatives and perceived benefits have allowed arms production to become uneconomical. Examples of these are the Egyptian jet fighter programme of the 1960s, India's

indigenous frigate of the 70s, and China's modernization of three wings of its security forces.

In most countries which are exporting arms, the military pressure is not as pervasive as was seen in earlier hypothesis about Third World arms production.

Thus, while arms production has become a "natural objective" of most Third World States, the success and political influence that they are able to exert in exporting armament to other Third World countries are debatable. Political influence is not the only thing that is important in trying to change other Thifd World countries perceptions to correspond to the supplier State. The difficulties that most Third World countries face are the lack of availability of skilled manpower, low levels of research and development facilities, limited size of national markets, resource mobilization problems, foreign currency shortages and insignificant spinoffs between the civilian and the military sectors of the economy.

Other difficulties that the Third World countries have been faced with are the increasing competition in the arms bazaar and the identification of the sectors of manufacturing and export in which they can increase their market share in relation to industrialized countries. Brazil is the only

successful Third World country that has been able to overcome the problem of identification of products. Their products are usually low technology items which are rugged and especially suited for Third World terrains.

In the decade of the 80s, Third World arms production is largely dependent on industrialized countries willingness to supply know-how, production technology and licences. This acts as a major limiting factor on the Third World trying to rid itself of political dependence on industrialized countries.

Given the obstacles that the Third World countries face, there should be an attempt by Third World countries to jointly collaborate in research and development by pooling in skilled manpower to raise the technological base for arms production. In this way they would be able to compete effectively with the industrialized countries for a significant market share. Secondly, the trend in developed countries is towards greater collaboration for manufacture of components in different countries to reduce the overall cost of the product. In the developed countries a hiatus exists in collaboration between the two blocs, NATO and WTO. Their differences are ideological and political. In the Third World, however, countries which have steady and good political relations with an adequate technological base and skilled manpower could come together to manufacture components

depending on the raw material available to reduce costs of the product. This in turn would spur the levels of technology in these countries and they could be used for greater industrialization and economic benefit.

The nature of the international arms market is such that today there are many countries which are ready to supply technology without political strings. These technologies should be used rather than trying to develop indigenously the same product of a questionable quality with the higher cost over runs.

Despite all the claims about indigenisation, only less than 10 per cent of the weapon systems and arms produced are locally developed. The bulk of arms production is either under foreign collaboration or licensed production. The concept of dependence has shifted from out right purchases to dependence over longer periods resulting from collaborations and technology transfers. The vicious circle that the Third World arms producers had tried to come out of when they began their quest for domestic arms production, now has taken a new ingenious and longer form of dependence. The only answer to coming out of political dependency trap is that the Third World countries having similar perception should come together to pool in their resources and raise levels of R&D and the general industrial base.

This can only happen if countries are serious about maintaining national sovereignty with their own capabilities. Politically such collaborations would lead to easing of tensions as Third World nations would be involved in a common cause and they would be able to face the challenge of neo-colonialism in a manner which does not compromise their national sovereignty.

APPENDICES

Table 16: China's Major Arms Transfers: Percentage Share of World Totals

	1973-7 Total	China	% total
Tanks	15,411	1,580	10.25
Artillery	7,606	310	4.1
APC	14,249	170	1.2
Minor surface Combatant	414	35	8.5
Submarines	36	4	11.1
Supersonic combat aircraft	3,181	200	6.3
Subsonic c.a.	1,248	75	6.0
Other aircraft	1,640	60	3.7
Helicopters	2,562	40	1.6

	1975-9			1978-82		
	Total	China	% total	Total	China	% total
total:						
Tanks	14,005	885	6.3	12,335	385	3.1
anti-air artil.	5,205	660	12.6	6,890	1,375	20.0
field artil.	10,860	470	4.3	12,100	795	6.6
APC	21,575	5	0.02	19,615	5	0.02
minor surf. combatant	656	22	3.3	497	21	4.2
Submarines		–		20	2	10.0
Missile Attack Boats		–		94	8	8.5
Supersonic a.c.	3,225	255	7.6	3,505	355	10.1
Subsonic a.c.	900	50	5.6	565	5	0.9
Other aircraft	1,920	175	9.1	1,665	135	8.1
Helicopters	2,415	35	1.4	2,435	5	0.2
SAMs		–		17,830	75	0.4

Source: US ACDA, *WMEAT*, 1968-77, 1971-80, 1972-82.

Table 3: Geographic Distribution of Chinese Deliveries, 1958-82

	Asia Pacific	Communist States	Mid-East N. Africa	Sub-Saharan Africa	Grand Total
1958-72	270	1,800	20	70	2,160
1973-9	330	500	90	160	1,080
1980-2	280	200	1,000	180	1,660
Total	880	2,500	1,110	410	4,900

Source: *Allocation of Resources*, 1983, p. 106.

Table 11: Total Small Arms Transfers

N. Africa (Algeria)	1959-62	A few hundred
Sub-Saharan Africa	1964-70	under 10,000
	1970-80	20,000-25,000
Middle East	1965-71	2,000-3,000
S.E. Asia (Excl. Indo-China)	1965-74	Under 10,000
S.E. Asia (Burma)	1975-81	over 10,000
Vietnam	1950-4	100,000-200,000
Indo-China	1960-3	a few hundred
	1964-75	100,000-200,000
Kampuchean Resistance	1979-84	50,000
S. Asia (Pakistan)	1966-71	5 Infantry divisions (15,000-20,000?)
Afghan Resistance	1980-4	1,000-2,000
Korea	1950-4	2,500,000

Note: It is impossible to reconcile different estimates of monetary value, tonnage, and numbers of men equipped. The above table is a *very rough* estimate of the number of men China has equipped in specific areas at different times.

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
Algeria	Ships	Kebir Class	PC	1981	166 tons	In addition to 2 from UK
			Mers-el-Kebir	..	29 knots	
			Licenser: UK	(1982)	3000 nm	
			In production	..	..	
		Kebir Type	Corvette	1983	500 tons	Unconfirmed; no Bulgarian corvette designs known; weight estimated
			Mers-el-Kebir	..	..	
			Licenser: Bulgaria	(1984)	..	
			In production	..	..	
Argentina	Aircraft	A-182J	Lightplane	1965	788 kg	Mainly for civilian use
			FMA	..	311 km/h	
			Licenser: USA	1966	1898 km	
			Completed	1967-70	35 units	
		Aero Boero 85	Lightplane	(1957)	422 kg	Mainly for civilian use; later version named Aero Boero 115
			Aero Boero	1959	200 km/h	
			Indigenous	(1959)	900 km	
			Completed	1960-74	37 units	
		CK-1 Colibri	Hel	1973	469 kg	Production cancelled after several prototypes
			Cicare	1977	163 km/h	
			Indigenous	..	480 km	
			Cancelled	..	..	
		Chincul Arrow	Trainer	(1972)	785 kg	Developed from Piper Cherokee; mainly for civilian use; military version for export
			Chincul	1978	314 km/h	
			Indigenous	(1981)	1352 km	
			In production	..	..	
		El Boyero	Lightplane	(1939)	325 kg	Production suspended due to problems with engine and spare parts; mainly for civilian use
			FMA/Petrolini	1940	160 km/h	
			Indigenous	(1948)	650 km	
			Completed	1950-51	6 units	
		IA-24 Qalquin	Bomber	(1945)	8164 kg	Similar to Mosquito (UK); wooden structure; cancelled early 1950s
			FMA	1946	440 km/h	
			Indigenous	..	..	
			Cancelled	..	..	
		IA-27 Pulqui	Fighter	(1946)	3600 kg	Designed by Dewoitine; British engine; first jet fighter in Latin America; cancelled late 1940s
			FMA	1947	850 km/h	
			Indigenous	..	..	
			Cancelled	..	..	
		IA-30 Nancu	Fighter	(1946)	5585 kg	Designed by Pallavicino; cancelled early 1950s
			FMA	1948	..	
			Indigenous	..	..	
			Cancelled	..	..	
		IA-33 Pulqui-2	Fighter	(1950)	3600 kg	Swept-wing design by Kurt Tank; British engine; never operational
			FMA	1950	1040 km/h	
			Indigenous	(1950)	..	
			Completed	1950-54	6 units	
		IA-35 Huanquero	Transport/trainer	(1951)	3500 kg	Various versions with Argentine engines
			FMA	1953	363 km/h	
			Indigenous	(1955)	1500 km	
			Completed	1957-64	47 units	
		IA-38 Condor	Transport	(1955)	18000 kg	Advanced 'Flying Wing' design by German Horten; Argentine engine; cancelled early 1960s
			FMA	1960	220 km/h	
			Indigenous	..	1200 km	
			Cancelled	..	..	
		IA-50 Guarani-1	Transport	(1960)	5000 kg	Developed from IA-35 Huanquero; production cancelled in favour of Guarani-2
			FMA	1962	490 km/h	
			Indigenous	..	2700 km	
			Cancelled	..	..	
		IA-50 Guarani-2	Transport	(1962)	3924 kg	Developed from Guarani-1
			FMA	1963	500 km/h	
			Indigenous	(1965)	2575 km	
			Completed	1968-74	41 units	
		IA-58A Pucara	COIN	(1966)	4037 kg	Production delayed due to design changes; output increased after Falkland/Malvinas War
			FMA	1969	750 km/h	
			Indigenous	(1974)	3042 km	
			In production	1976-84	100 units	
		IA-58B Pucara	COIN	1977	4030 kg	Developed from IA-58; improved electronics
			FMA	1979	750 km/h	
			Indigenous		1350 km	
			Planned			

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		IA-58C Pucara	COIN	(1983)	4037 kg	Single-seat version armed
			FMA	1985	750 km/h	with two 30-mm cannons
			Indigenous	..	3042 km	
			Planned	..	..	
		IA-63 Pampa	Adv trainer/strike	1977	3490 kg	Design assistance from
			FMA	1984	..	Dornier (FRG); similar to
			Indigenous	(1986)	1500 km	Alpha Jet; planned
			Planned	..	..	production rate: 3/month
		IA-66 Pucara	Trainer	(1978)	4037 kg	Developed from IA-58
			FMA	1980	500 km/h	Pucara; French engine
			Indigenous	..	1350 km	
			Cancelled	..	..	
		IA-DL-22	Trainer	(1948)	1520 kg	Wooden structure; Argen-
			FMA	1948	290 km/h	tine engine; cancelled
			Indigenous	..	5200 km	early 1950s
			Cancelled	..	..	
		Model 500D	Hel	1972	493 kg	Mainly for civilian use
			RACA	..	282 km/h	
			Licenser: USA	(1974)	482 km	
			Completed	1974-80	40 units	
	Armoured vehicles	Model 77 155mm	TH	(1975)	8 tons	Developed from French
			CITEFA/Rio Tercero	1977	..	Mk-F3 howitzer
			Indigenous	(1978)	22 km	
			Completed	1979-81	6 units	
		Model 81 155mm	TH	(1980)	8 tons	Improved version of Model
			CITEFA/Rio Tercero	1981	..	77 howitzer
			Indigenous	(1982)	25 km	
			In production	1983-84	20 units	
		Nahuel DL-43	MBT	(1943)	35 tons	Production cancelled
			CITEFA	1944	..	after 6 preproduction
			Indigenous	..	..	units when cheap US tanks
			Cancelled	..	..	became available
		Roland	APC	1970	3 tons	Probably assembled from
			Rio Tercero	..	110 km/h	kits
			Licenser: Switzerland	1973	550 km	
			Completed	1974-79	80 units	
		TAM	MT	1974	30 tons	Developed by Thyssen
			TAMSE	..	75 km/h	(FRG) for Argentine Army
			Licenser: FR Germany	(1979)	900 km	
			In production	1981-84	190 units	
		TAM Palmaria	SPH	(1984)	43 tons	Palmaria 155-mm turret
			TAMSE	..	60 km/h	fitted to TAM chassis;
			Indigenous	(1985)	400 km	25 turrets reportedly
			Planned	..	..	ordered 1984
		VAE/VAPE	APC	1980	12 tons	2 prototypes delivered
			CITEFA	..	92 km/h	from France; cancelled
			Licenser: France	..	1000 km	for financial reasons
			Cancelled	..	..	
		VCC	APC	(1980)	30 tons	Developed from TAM
			TAMSE	1983	72 km/h	
			Indigenous	(1984)	820 km	
			In production	..	..	
		VCTP	ICV	(1976)	27 tons	Developed from TAM
			TAMSE	1977	72 km/h	
			Indigenous	(1980)	870 km	
			In production	1981-84	275 units	
	Missiles	Condor	SSM	1984	..	Derived from Mathogo ATM;
			CITEFA	..	..	in development stage
			Indigenous	..	..	
			Planned	..	..	
		Martin Pescador	ASM	(1978)	40 kg	Additional versions under
			CITEFA	1980	2500 km/h	development; radio-guided
			Indigenous	(1981)	9 km	
			In production	1981-84	68 units	
		Mathogo	ATM	(1974)	11 kg	Similar to Cobra (FRG)
			CITEFA	1976	360 km/h	and Bantam (Sweden) ATMs
			Indigenous	(1978)	2 km	
			In production	980-84	120 units	

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
	Ships	Azopardo Class	Frigate	(1951)	1220 tons	Based on King Class
			AFNE	..	20 knots	designed late 1930s
			Indigenous	(1953)	2300 nm	
			Completed	1955-58	2 units	
		Bahia Paraiso	Support ship	(1979)	9600 tons	Carries 2 helicopters;
			Principe y Menghi	..	18 knots	can be used as icebreaker
			Indigenous	1979	..	
			Completed	1981	1 unit	
		Cabo S. Antonio	LS	(1968)	4164 tons	Based on US De Soto Class
			AFNE	..	16 knots	design
			Indigenous	(1968)	..	
			Completed	1978	1 unit	
		Costa Sur Class	Support ship	(1975)	4600 tons	
			Principe y Menghi	..	15 knots	
			Indigenous	(1977)	..	
			Completed	1978-79	3 units	
		Lynch Class	PC	(1962)	100 tons	Serving with Prefectura
			AFNE	..	22 knots	Naval
			Indigenous	(1963)	..	
			Completed	1964-67	3 units	
		Meko-140 Type	Frigate	1980	1470 tons	Scaled-down version of
			AFNE	..	27 knots	Meko-360; arms: 4 MM-40
			Licenser: FR Germany	1981	4000 nm	ShShMs; Lynx helicopter
			In production	1983-84	1 unit	
		Surubi Class	PC	(1949)	65 tons	
			Ast. Naval del Estero	..	12 knots	
			Indigenous	(1950)	..	
			Completed	1951	1 unit	
		Tonina Class	PC	(1975)	200 tons	Serving with Prefectura
			Sanym	..	..	Naval
			Indigenous	(1976)	3400 nm	
			Completed	1977	1 unit	
		Type 42	Destroyer	1970	3150 tons	In addition to 1 bought
			AFNE	..	30 knots	directly from UK; long
			Licenser: UK	1971	4000 nm	delay due to sabotage
			Completed	1981	1 unit	and technical problems
		Type TR-1700	Submarine	1977	2100 tons	In addition to 2 directly
			Domecq Garcia	..	25 knots	from FRG
			Licenser: FR Germany	1981	15000 nm	
			In production	..	..	
Bangladesh	Ships	Kacha Class	PC	(1970)	70 tons	
			Narayangonj	..	11 knots	
			Indigenous	(1971)	700 nm	
			Completed	1972-77	5 units	
Brazil	Aircraft	122A Uirapuru	Trainer/COIN	(1962)	540 kg	
			Aerotec	1965	220 km/h	
			Indigenous	1968	800 km	
			Completed	1969-78	156 units	
		A-132 Tangara	Trainer	1977	560 kg	Planned follow-on to
			Aerotec	1981	208 km/h	Uirapuru; cancelled
			Indigenous	..	..	
			Cancelled	..	..	
		AM-X	Fighter/ground attack	..	6000 kg	187 for Italy, 79 for
			EMBRAER/Aeritalia/Aermacchi	1984	..	Brazil; first prototype
			Indigenous	1985	..	crashed 1984
			Planned	..	..	
		EMB-110	Transport	(1964)	3380 kg	Originally designed for
			EMBRAER	1968	558 km/h	military transport and
			Indigenous	1972	2220 km	utility; also for rescue
			In production	1973-84	149 units	and surveillance
		EMB-111	Mar patrol	1973	3760 kg	Maritime patrol version
			EMBRAER	1977	360 km/h	of EMB-110 Bandeirante
			Indigenous	1977	2800 km	
			In production	1977-84	22 units	
		EMB-120	Transport	1979	5576 kg	Military versions planned
			EMBRAER	1983	500 km/h	for maritime patrol and
			Indigenous	1984	2907 km	AEW missions
			In production			

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		EMB-121 Xingu	Transport	1974	3620 kg	Basically civilian, also
			EMBRAER	1976	450 km/h	for executive transport
			Indigenous	1977	2350 km	and AF training
			In production	1978-84	51 units	
		EMB-312 Tucano	Trainer	1978	1810 kg	
			EMBRAER	1980	539 km/h	
			Indigenous	1982	1916 km	
			In production	1983-84	80 units	
		EMB-326 Xavante	Trainer/COIN	1970	3123 kg	Licensed production of
			EMBRAER	..	797 km/h	MB-326GB
			Licenser: Italy	1971	2445 km	
			Completed	1972-83	182 units	
		EMB-500	Transport	1970	6400 kg	
			EMBRAER	1974	500 km/h	
			Indigenous	..	2600 km	
			Cancelled	..	..	
		HB-315B Gavaio	Hel	1977	1021 kg	Version of French SA-315B
			Helibras	..	210 km/h	Lama
			Licenser: France	1979	515 km	
			In production	1981-84	12 units	
		HB-350M Esquilo	Hel	1977	1027 kg	Licensed production of
			Helibras	..	233 km/h	AS-350B Ecureuil; mostly
			Licenser: France	1980	740 km	for civilian use
			In production	1981-84	15 units	
		Paulistinha	Trainer	(1943)	390 kg	Basic trainer; built in 2
			Neiva	1943	160 km/h	batches: before 1950 and
			Indigenous	(1944)	700 km	1959-62
			Completed	1959-62	39 units	
		Regente-360C	Lightplane	1959	680 kg	Utility aircraft
			Neiva	1961	280 km/h	
			Indigenous	1963	950 km	
			Completed	1965-68	80 units	
		Regente-420L	Lightplane	1959	680 kg	Liaison and observation
			Neiva	1967	280 km/h	aircraft
			Indigenous	1967	950 km	
			Completed	1969-71	40 units	
		S-11	Trainer	(1954)	810 kg	Plans for production of
			Fokker Brasil	..	209 km/h	more advanced Fokker
			Licenser: Netherlands	(1956)	..	S-12 and S-14 cancelled
			Completed	1956-59	100 units	
		Universal-1	Trainer	1963	1150 kg	Also civilian versions
			Neiva	1966	500 km/h	
			Indigenous	1968	1500 km	
			Completed	1971-79	150 units	
		Universal-2	Trainer	(1976)	1900 kg	Programme cancelled 1980
			Neiva	1978	320 km/h	when Embraer bought Neiva
			Indigenous	..	515 km	
			Cancelled	..	..	
	Armoured vehicles	Charrua	APC	(1982)	6 tons	Tracked
			Industrias Motopecas	1984	60 km/h	
			Indigenous	..	..	
			Planned	..	..	
		EE-11 Urutu	APC	1970	11 tons	Arms: 12.7-mm MG; also
			Engesa	1973	95 km/h	with 60/90-mm gun or ATMs
			Indigenous	1974	600 km	
			In production	1974-84	810 units	
		EE-17 Sucuri	TD	1976	17 tons	Arms: 105-mm gun and MGs
			Engesa	1977	110 km/h	
			Indigenous	1978	600 km	
			Completed	1978-82	340 units	
		EE-3 Jararaca	SC	(1978)	5 tons	Arms: 57-mm gun or ATMs
			Engesa	1979	110 km/h	
			Indigenous	(1980)	750 km	
			In production	1981-84	350 units	
		EE-9 Cascavel	AC	1970	10 tons	With 37-mm US gun, 90-mm
			Engesa	1973	100 km/h	French gun or 90-mm
			Indigenous	1974	750 km	Cockerill/Engesa gun;
			In production	1974-84	1490 units	West German or US

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		EE-T1 Osorio	MT	1981	35 tons	Competing with MB-3 for
			Engesa	1984	70 km/h	order of 50-100 by
			Indigenous	(1985)	550 km	Brazilian Army; possibly
			Planned	..	..	developed with Libyan aid
		MB-3 Tamoyo	MT	1979	29 tons	Competing with EE-T1;
			Bernardini	1984	70 km/h	formerly known as X-30
			Indigenous	..	700 km	
			Planned	..	..	
		X1A2	LT	1975	19 tons	Developed from M3 Stuart
			Bernardini	..	55 km/h	(USA); Brazilian Army
			Indigenous	1980	750 km	designation: MB-2
			Completed	1981-83	30 units	
		XLF-40	ICV	(1979)	20 tons	Rocket carrier; based on
			Bernardini	1980	60 km/h	US M3A1 chassis; status
			Indigenous	..	800 km	unclear
			Planned	..	..	
		XLP-10	BL	(1979)	20 tons	Based on XIA2 tank;
			Bernardini	1980	60 km/h	status unclear
			Indigenous	..	750 km	
			Planned	..	..	
	Missiles	Cobra-2000	ATM	1973	2 kg	Status unclear; 'pre-
			IPA	..	300 km/h	production' missiles
			Licenser: FR Germany	(1975)	2 km	delivered to armed forces
			Completed	1976-81	300 units	
		MAA-1 Piranha	AAM	(1975)	85 kg	Successfully tested with
			D.F. Vasconcelos/CFA	1984	3700 km/h	EMB-326; intended for
			Indigenous	(1984)	6 km	AM-X fighter
			In production	1984	10 units	
		MAS-1 Carcara	ASM	(1973)	45 kg	TV-guided; development
			Avibras	..	..	slowed due to US freeze
			Indigenous	..	..	of co-operation in 1977;
			Planned	..	..	to arm AMX fighter
	Ships	Argus Class	Support ship	(1954)	250 tons	Survey ship
			Arsenal de Marinha	..	15 knots	
			Indigenous	1955	1200 nm	
			Completed	1959	3 units	
		Niteroi Class	Frigate	1970	3200 tons	Arms: 4 Exocet ShShMs;
			Arsenal de Marinha	..	17 knots	last ship for training
			Licenser: UK	1972	5300 nm	
			In production	1979-85	2 units	
		Piratini Class	PC	(1968)	105 tons	
			Arsenal de Marinha	..	17 knots	
			Indigenous	(1969)	1700 nm	
			Completed	1970-71	6 units	
		Roraima Class	PC	(1971)	340 tons	1 exported to Paraguay
			Maclaren	..	14 knots	
			Indigenous	(1973)	6000 nm	
			In production	1974-84	3 units	
		Teixeira Class	PC	(1967)	690 tons	For river patrol
			Arsenal de Marinha	..	16 knots	
			Indigenous	(1969)	6800 nm	
			Completed	1973	2 units	
		Type 209/3	Submarine	1982	1440 tons	In addition to 1 supplied
			Arsenal de Marinha	..	22 knots	directly from FRG
			Licenser: FR Germany	1982	8200 nm	
			In production	..	..	
		V-28 Type	Frigate	(1978)	1600 tons	To be armed with Exocet
			Arsenal de Marinha	..	29 knots	ShShMs; up to 12 may be
			Indigenous	1982	4000 nm	built
			In production	..	..	
Burma	Ships	LCU-Type	LC	(1964)	180 tons	
			Government SY	..	10 knots	
			Indigenous	(1965)	..	
			Completed	1966	1 unit	
		Nawarat Class	PC	(1958)	400 tons	
			Government SY	..	12 knots	
			Indigenous	(1959)	..	
			Completed	1960	2 units	

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
	Missiles	Early Bird	SAM	..	2283 kg	
			Arab-British Dynamics	..	..	
			Indigenous	1985	34 km	
			Planned	..	..	
		Sakr Eye	Port SAM	..	15 kg	Improved version of SA-7 Grail; serial production started 1984; production rate: 200 missiles/year
			Sakr	1983	..	
			Indigenous	1984	..	
			In production	1984	100 units	
		Swingfire	ATM	1977	..	Crew-portable version; can be launched from any sized vehicle, from Land Rover upwards
			Arab-British Dynamics	..	..	
			Licenser: UK	1978	4 km	
			In production	1979-84	2750 units	
	Ships	Nisr Class	PC	..	110 tons	1x20-mm gun
			Castro SY	..	24 knots	
			Indigenous	1963	..	
			Completed	1963-83	5 units	
		October Class	FAC	..	82 tons	Based on Soviet Komar Class hull; west European weapons and electronics; retrofitted by Vosper, UK
			Ras-El-Tin SY	..	40 knots	
			Indigenous	1975	400 nm	
			Completed	1975-76	6 units	
		Timsah Class	PC	..	100 tons	Additional 6 reportedly ordered in 1984
			Timsah SY	..	25 knots	
			Indigenous	(1980)	..	
			In production	1981-84	9 units	
Gabon	Ships	Leon M'Ba Class	PC	(1966)	90 tons	Arms: MG and 2 guns; larger version built for Cameroon Navy
			AC de l'Afrique Equatoriale	..	15 knots	
			Indigenous	(1967)	..	
			Completed	1968-74	2 units	
India	Aircraft	Do-228	Transport	1982	2908 kg	Complementing HS-748
			HAL	..	432 km/h	
			Licenser: FR Germany	1983	1150 km	
			In production	1984	3 units	
		Gnat	Fighter/bomber	1956	..	
			HAL	..	1000 km/h	
			Licenser: UK	1962	1000 km	
			Completed	1963-74	215 units	
		Gnat T-2 Ajeet	Trainer	(1980)	2307 kg	Developed from Gnat Mk-1; development slowed after prototype crash 1982
			HAL	1982	1152 km/h	
			Indigenous	..	259 km	
			Planned	..	..	
		Gnat-2 Ajeet	Fighter	(1973)	2307 kg	Indian development of Gnat Mk-1
			HAL	1975	1152 km/h	
			Indigenous	(1975)	259 km	
			Completed	1976-81	79 units	
		HAL ALH	Hel	1973	1925 kg	Development for all services; French or Canadian engine
			HAL	1981	330 km/h	
			Indigenous	..	700 km	
			Planned	..	..	
		HAOP-27 Krispak	Lightplane	(1958)	..	Developed parallel to civilian HUL-26 Pushpak
			HAL	1959	209 km/h	
			Indigenous	(1960)	473 km	
			Completed	1964-70	68 units	
		HF-24 Marut-1	Fighter/ground attack	1956	6208 kg	Designed by Kurt Tank; led to designs for HF-25 and HF-73 which never entered production
			HAL	1961	1468 km/h	
			Indigenous	(1963)	1444 km	
			Completed	1964-77	125 units	
		HF-24 Marut-1T	Trainer	1956	6250 kg	Based on HF-24 Marut-1
			HAL	1970	1468 km/h	
			Indigenous	(1973)	1445 km	
			Completed	1975-77	18 units	
		HJT-16 Kiran	Trainer	(1960)	2432 kg	
			HAL	1964	718 km/h	
			Indigenous	1965	800 km	
			Completed	1968-81	190 units	
		HJT-16 Kiran-2	Trainer/COIN	1974	2966 kg	Initial production of 60 planned; British engine chosen after problems
			HAL	1976	858 km/h	
			Indigenous	1979	615 km	
			In production			

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		HPT-32	Trainer	1976	890 kg	To replace HT-2; production delays due to design changes
			HAL	1981	445 km/h	
			Indigenous	1981	744 km	
			In production	1984	3 units	
		HS-748	Transport	1959	11703 kg	Also for civilian use; some taken over by AF from civil airlines
			HAL	..	608 km/h	
			Licenser: UK	1963	3038 km	
			Completed	1964-84	61 units	
		HT-2	Trainer	(1949)	702 kg	
			HAL	1951	209 km/h	
			Indigenous	1953	650 km	
			Completed	1953-59	90 units	
		HTT-34	Trainer	(1983)	848 kg	Developed from HPT-32; turboprop
			HAL	1984	306 km/h	
			Indigenous	(1985)	436 km	
			Planned	..	..	
		Jaguar	Fighter	1978	7000 kg	In addition to 40 from UK; indigenization: 75%
			HAL	..	1350 km/h	
			Licenser: UK	1981	3524 km	
			In production	1982-84	10 units	
		MiG-21FL	Fighter	(1962)	8200 kg	First MiG-21 version produced in India
			HAL	..	2230 km/h	
			Licenser: USSR	1966	1800 km	
			Completed	1967-73	196 units	
		MiG-21MF	Fighter	(1972)	9400 kg	
			HAL	..	2230 km/h	
			Licenser: USSR	1973	1800 km	
			Completed	1973-81	150 units	
		MiG-21bis	Fighter	1976	9400 kg	Last MiG-21 version produced in India
			HAL	..	1800 km/h	
			Licenser: USSR	1979	1800 km	
			In production	1979-85	140 units	
		MiG-27	Fighter/ground attack	(1983)	15500 kg	Derivative of MiG-23
			HAL	..	1700 km/h	
			Licenser: USSR	1984	1000 km	
			In production	1984	2 units	
		Prentice-1	Trainer	1949	1470 kg	
			HAL	..	224 km/h	
			Licenser: UK	(1950)	637 km	
			Completed	1950-53	62 units	
		SA-315B Lama	Hel	1971	1021 kg	First 40 assembly only; increased local content after 1976/77; also for civilian use
			HAL	..	210 km/h	
			Licenser: France	1972	515 km	
			In production	1973-84	131 units	
		SA-316B Chetak	Hel	1962	1143 kg	Also for civilian use; some production of parts for French AS-316s
			HAL	..	210 km/h	
			Licenser: France	1964	540 km	
			In production	1964-84	257 units	
	Armoured vehicles	BMP-2	APC/ICV	1983	15 tons	Original plans to develop Indian APC postponed in favour of licensed production
			Avadi Company	..	60 km/h	
			Licenser: USSR	1984	500 km	
			In production	1984	10 units	
		MBT-80 Chetak	MBT	1974	48 tons	First prototype 1983; West German engine
			Avadi Company	1983	..	
			Indigenous	1984	..	
			In production	..	..	
		Mk-1 75mm	TG	(1972)	..	Producer and production schedule unconfirmed
			Kanpur Ordnance Factory	1974	..	
			Indigenous	(1980)	..	
			In production	1982-84	30 units	
		Mk-2 105mm	TG	(1974)	..	Similar in appearence to British Abbot gun; parallel development of other 105-mm TG possible
			Kanpur Ordnance Factory	1974	..	
			Indigenous	(1980)	..	
			In production	1982-84	30 units	
		T-72	MBT	1980	41 tons	India may produce updated T-74 version instead
			Avadi Company	..	80 km/h	
			Licenser: USSR	1984	500 km	
			In production			

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		Vijayanta	MBT	1961	41 tons	British Vickers MBT built
			Avadi Company	..	48 km/h	under licence agreement
			Licenser: UK	(1964)	480 km	of 1961; indigenization:
			Completed	1965-82	1215 units	95%
		Vijayanta GCT	SPH	(1984)	..	Adaption of French turret
			Avadi Company	..	48 km/h	to Vijayanta chassis;
			Licenser: France	..	480 km	probably cancelled in
			Cancelled	..	..	favour of Vijayanta-130
		Vijayanta-130	SPH	(1980)	60 tons	Combination of Indian-
			Avadi Company	1981	48 km/h	built tank and Soviet
			Indigenous	(1982)	480 km	M-46 130-mm gun
			In production	1982-84	16 units	
	Missiles	AA-2 Atoll	AAM	1963	70 kg	Reported indigenization:
			Bharat Dynamics	..	2 km/h	100%; production beyond
			Licenser: USSR	(1968)	3 km	1979 unconfirmed
			In production	1968-84	1170 units	
		Milan	ATM	1981	3 kg	Total production of
			Bharat Dynamics	..	720 km/h	10 000 units planned
			Licenser: France	(1984)	2 km	
			In production	..	..	
		SS-11	ATM	1970	30 kg	Indigenization: 70%
			Bharat Dynamics	..	579 km/h	
			Licenser: France	(1970)	3 km	
			Completed	1971-82	10600 units	
	Ships	Abhay Class	PC	(1958)	120 tons	Similar to British Ford
			Hooghey Docks	..	18 knots	Class
			Indigenous	(1959)	..	
			Completed	1960-62	4 units	
		Da Gama Class	LC	(1976)	600 tons	
			Mazagon Docks	..	10 knots	
			Indigenous	(1977)	1000 nm	
			Completed	1978-79	4 units	
		Godavari Class	Destroyer	1978	3600 tons	Follow-on to Nilgiri
			Mazagon Docks	..	30 knots	Class
			Indigenous	1983	4500 nm	
			In production	1983-84	2 units	
		Ham Class	MSC	(1966)	120 tons	In addition to 2
			Mazagon Docks	..	14 knots	delivered 1954-55
			Licenser: UK	1966	..	
			Completed	1968-70	2 units	
		Mazagon Type	Corvette	(1981)	1200 tons	Ordered early 1983
			Mazagon Docks	..	27 knots	
			Indigenous	1983	..	
			In production	..	..	
		Nilgiri Class	Frigate	1964	2450 tons	Indigenization: 53%
			Mazagon Docks	..	27 knots	
			Licenser: UK	1966	4500 nm	
			Completed	1972-81	6 units	
		Pradhayak Class	Tanker	(1974)	376 tons	
			Rajabagan SY	..	9 knots	
			Indigenous	(1975)	..	
			Completed	1977-82	3 units	
		SDB Mk-2 Class	PC	(1974)	203 tons	
			Garden Reach	..	29 knots	
			Indigenous	1976	1400 nm	
			Completed	1977-79	3 units	
		Sandhayak Class	Support ship	(1974)	1200 tons	Survey ship with 1
			Garden Reach	..	17 knots	helicopter
			Indigenous	(1975)	6000 nm	
			Completed	1981-83	3 units	
		Tir Class	Training ship	(1981)	2000 tons	With helicopter deck
			Mazagon Docks	..	..	
			Indigenous	(1983)	..	
			Completed	1984	1 unit	
		Type 1500	Submarine	1984	1450 tons	First delivery planned
			Mazagon Docks	..	22 knots	1987
			Licenser: FR Germany			

Country	Weapon category	Weapon designation	Type/production data	Years	Specifications	Comments
		Vikram Class	Corvette	(1979)	1040 tons	Designed with Dutch
			Mazagon Docks	..	22 knots	assistance; large patrol
			Indigenous	(1980)	3500 nm	corvette with helicopter
			In production	1983-85	2 units	
Indonesia	Aircraft	AS-332	Hel	(1982)	4200 kg	Total orders by end-1984:
			Nurtanio	..	296 km/h	69; military orders: 26
			Licenser: France	1982	..	
			In production	1983-84	2 units	
		BK-117	Hel	1982	1650 kg	Approx. 100 to be built
			Nurtanio	..	278 km/h	from 1985; two demonstra-
			Licenser: FR Germany	(1984)	..	tion aircraft assembled
			In production	1984	2 units	1984
		CN-212	Transport	1976	3780 kg	Toral orders by 1984:
			Nurtanio	..	374 km/h	185, of which some 80 for
			Licenser: Spain	1976	1760 km	military customers
			In production	1976-84	22 units	
		CN-235	Transport	1980	8225 kg	32 ordered by Indonesian
			CASA/Nurtanio (Airtec)	1983	509 km/h	armed forces; orders for
			Indigenous	(1983)	1668 km	a total 106 by 1984
			In production	..	..	
		LT-200	Trainer	1973	409 kg	Production halted 1976
			Lipnur	1974	300 km/h	when Lipnur became
			Indigenous	1974	613 km	Nurtanio; based on US
			Completed	1974-76	30 units	lightplane Pazmany PL-2
		Model 412	Hel	1982	2700 kg	A total of more than 100
			Nurtanio	..	259 km/h	to be assembled from
			Licenser: USA	1984	420 km	1984-85; military orders
			In production	..	..	by 1984:28
		NBo-105	Hel	1976	1256 kg	Total orders by 1984:
			Nurtanio	..	270 km/h	123, of which approx. 50
			Licenser: FR Germany	1976	1158 km	for military use
			In production	1976-84	31 units	
		NU-90 Belalang	Trainer	..	472 kg	Modified version of Piper
			IAF Works	1958	184 km/h	Cub L-4; used as military
			Indigenous	1959	..	trainer
			Completed	1959-66	16 units	
		SA-330 Puma	Hel	1980	3766 kg	7 built for Indonesian
			Nurtanio	..	294 km/h	Air Force and 4 for a
			Licenser: France	1981	..	civilian customer
			Completed	1981-83	7 units	
	Ships	Kupang Class	LC	..	200 tons	Based on US LCU-1610
			NTC, Surabaya	..	11 knots	
			Indigenous	1977	700 nm	
			Completed	1978-80	3 units	
		LCM Type	LC	..	..	Small landing craft
			..	..	..	
			Indigenous	1976	..	
			Completed	1976-79	13 units	
		Mawar Class	PC	..	150 tons	Submarine chaser
			NTC, Surabaya	..	21 knots	
			Indigenous	1966	..	
			Completed	1966-70	3 units	
		PB-57 Type	PC	1982	300 tons	6 to be built locally in
			PAL SY	..	38 knots	addition to 2 from FRG
			Licenser: FR Germany	(1984)	..	
			In production	..	..	
Iran	Aircraft	Model 214A	Hel	1975	3380 kg	Cancelled in 1979 before
			Bell/IHI	..	256 km/h	start of production
			Licenser: USA	..	501 km	
			Cancelled	..	..	
		Model 214ST	Hel	1978	7030 kg	Developed with Iranian
			Bell/IHI	..	241 km/h	financial assistance;
			Licenser: USA	..	481 km	cancelled in 1979 before
			Cancelled	..	..	start of production
	Missiles	AGM-65A	ASM	1978	210 kg	Cancelled in 1979
			BEI/Hughes	..	2000 km/h	
			Licenser: USA	..	48 km	
			Cancelled			

Appendix 1. Value of production of major weapons, by country and year, 1950–84

Figures are US $ million, at constant (1975) prices.

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	**Total**
Argentina											
1950	2	0	0	0	2	0	0	0	0	0	**2**
1951	1	0	0	2	3	0	0	0	0	0	**3**
1952	1	0	0	0	1	0	0	0	0	0	**1**
1953	3	0	0	0	3	0	0	0	0	0	**3**
1954	1	0	0	0	1	0	0	0	0	0	**1**
1955	0	0	0	5	5	0	0	0	0	0	**5**
1957	2	0	0	0	2	0	0	0	0	0	**2**
1958	2	0	0	5	7	0	0	0	0	0	**7**
1959	2	0	0	0	2	0	0	0	0	0	**2**
1960	2	0	0	0	2	0	0	0	0	0	**2**
1961	2	0	0	0	2	0	0	0	0	0	**2**
1962	2	0	0	0	2	0	0	0	0	0	**2**
1963	2	0	0	0	2	0	0	0	0	0	**2**
1964	2	0	0	3	5	0	0	0	0	0	**5**
1965	–	0	0	3	3	0	0	0	0	0	**3**
1966	–	0	0	0	0	0	0	0	0	0	**–**
1967	0	0	0	3	3	–	0	0	0	0	**3**
1968	8	0	0	0	8	–	0	0	0	0	**8**
1969	10	0	0	0	10	–	0	0	0	0	**10**
1970	8	0	0	0	8	–	0	0	0	0	**8**
1971	5	0	0	0	5	0	0	0	0	0	**5**
1972	5	0	0	0	5	0	0	0	0	0	**5**
1973	3	0	0	0	3	0	0	0	0	0	**3**

1964	–	0	0	0	–	4	0	0	0	4	**4**
1965	–	0	0	0	–	4	0	0	0	4	**4**
1966	0	0	0	0	0	4	0	0	0	4	**4**
1967	0	4	0	0	4	4	0	0	0	4	**8**
1968	0	4	0	0	4	4	0	0	0	4	**8**
1969	0	4	0	0	4	4	0	0	0	4	**8**
1970	0	4	0	0	4	0	0	0	0	0	**4**
1971	0	4	0	0	4	0	0	0	0	0	**4**
1972	0	4	0	0	4	0	0	0	0	0	**4**
1973	0	4	0	0	4	0	0	0	0	0	**4**
1974	0	4	0	0	4	0	0	0	0	0	**4**
1975	0	4	0	17	21	0	0	0	0	0	**21**
1976	0	4	0	17	21	0	0	0	0	0	**21**
1977	0	4	0	0	4	0	0	0	0	0	**4**
1978	–	4	0	0	4	0	0	0	0	0	**4**
1979	–	4	0	0	4	0	0	2	0	2	**6**
1980	–	4	0	0	4	0	0	3	0	3	**8**
1981	–	4	0	2	6	0	0	3	0	3	**9**
1982	–	4	0	2	6	4	0	3	0	8	**14**
1983	–	4	0	1	5	51	0	3	0	55	**60**
1984	–	4	1	2	7	62	0	3	0	65	**72**
Total	7	76	1	40	125	145	0	19	0	164	**289**
Gabon											
1968	0	0	0	–	–	0	0	0	0	0	–
1974	0	0	0	–	–	0	0	0	0	0	–
Total	0	0	0	–	–	0	0	0	0	0	–
India											
1950	0	0	0	0	0	1	0	0	0	1	**1**
1951	0	0	0	0	0	1	0	0	0	1	**1**
1952	0	0	0	0	0	1	0	0	0	1	**1**
1953	–	0	0	0	0	1	0	0	0	1	**2**
1954	–	0	0	0	0	0	0	0	0	0	–
1955	–	0	0	0	0	0	0	0	0	0	–
1956	–	0	0	0	0	0	0	0	0	0	–

Appendix 1—*continued*

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	Total
1974	2	0	0	0	2	1	1	0	0	2	**4**
1975	0	0	0	0	0	1	1	0	0	2	**2**
1976	14	0	0	0	14	1	1	0	0	2	**16**
1977	14	0	0	1	14	1	1	0	0	2	**16**
1978	14	0	0	38	52	1	1	0	0	3	**54**
1979	14	1	0	16	30	1	1	0	0	3	**33**
1980	14	1	–	0	14	1	0	0	0	1	**15**
1981	14	8	1	25	48	0	20	0	64	85	**133**
1982	14	29	2	0	45	0	28	0	0	28	**73**
1983	14	32	2	0	48	0	28	0	26	54	**102**
1984	27	18	2	0	47	0	20	0	0	20	**68**
Total	201	88	8	100	397	9	102	0	91	202	**599**
Bangladesh											
1972	0	0	0	1	1	0	0	0	0	0	**1**
1974	0	0	0	–	–	0	0	0	0	0	**–**
1977	0	0	0	1	1	0	0	0	0	0	**1**
Total	0	0	0	2	2	0	0	0	0	0	**2**
Brazil											
1956	0	0	0	0	0	1	0	0	0	1	**1**
1957	0	0	0	0	0	1	0	0	0	1	**1**
1958	0	0	0	0	0	1	0	0	0	1	**1**
1959	–	0	0	2	2	0	0	0	0	0	**2**
1962	–	0	0	0	–	0	0	0	0	0	**0**
1965	–	0	0	0	–	0	0	0	0	0	**0**
1966	–	0	0	0	–	0	0	0	0	0	**0**
1967	–	0	0	0	–	0	0	0	0	0	**0**
1968	–	0	0	0	–	0	0	0	0	0	**0**
1969	3	0	0	0	3	0	0	0	0	0	**3**
1970	5	0	0	4	8	0	0	0	0	0	**8**
1971	5	0	0	18	24	0	0	0	0	0	**24**
1972	5	0	0	0	5	14	0	0	0	14	**19**
1973	20	0	0	4	24	14	0	0	0	14	**38**
1974	26	3	0	1	30	14	0	0	0	14	**45**
1975	31	8	0	0	39	14	0	0	0	14	**53**
1976	24	13	0	1	38	14	0	–	0	15	**52**
1977	25	24	0	0	49	14	0	–	0	15	**63**
1978	30	42	0	0	72	9	0	–	0	9	**81**
1979	18	71	0	0	89	7	0	–	59	66	**155**
1980	8	76	0	0	84	7	0	–	59	66	**151**
1981	13	87	0	0	100	23	0	–	0	24	**124**
1982	26	73	0	0	98	25	0	0	0	25	**123**
1983	28	47	0	0	75	9	0	0	0	9	**84**
1984	41	42	–	1	85	0	0	0	0	0	**85**
Total	309	486	–	32	827	169	0	2	118	288	**1116**
Burma											
1960	0	0	0	2	2	0	0	0	0	0	**2**
1966	0	0	0	1	1	0	0	0	0	0	**1**
1969	0	0	0	–	–	0	0	0	0	0	**–**
1983	0	0	0	1	1	0	0	0	0	0	**1**
Total	0	0	0	3	3	0	0	0	0	0	**3**
Chile											
1966	0	0	0	1	1	0	0	0	0	0	**1**
1967	0	0	0	1	1	0	0	0	0	0	**1**
1968	0	0	0	0	0	0	0	0	1	1	**1**
1971	0	0	0	0	0	0	0	0	1	1	**1**
1981	0	0	0	0	0	–	2	0	0	2	**2**
1982	0	0	0	0	0	–	3	0	4	7	**7**
1983	0	0	0	0	0	1	3	0	4	8	**8**
1984	0	1	0	0	1	1	3	0	4	8	**9**
Total	0	1	0	1	2	3	12	0	13	28	**30**

Appendix 1—*continued*

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	**Total**
1957	–	0	0	0	0	0	0	0	0	0	–
1958	–	0	0	0	0	0	0	0	0	0	–
1959	–	0	0	0	0	0	0	0	0	0	–
1960	0	0	0	–	–	0	0	0	0	0	–
1961	0	0	0	–	–	0	0	0	0	0	–
1962	0	0	0	–	–	0	0	0	0	0	–
1963	0	0	0	0	0	18	0	0	0	18	**18**
1964	4	0	0	0	4	23	0	0	0	23	**26**
1965	22	0	0	0	22	27	2	0	0	29	**51**
1966	7	0	0	0	7	35	4	0	0	39	**47**
1967	29	0	0	0	29	77	11	0	0	88	**117**
1968	32	0	0	0	32	114	11	–	1	125	**157**
1969	30	0	0	0	30	118	21	–	0	139	**169**
1970	31	0	0	0	31	118	21	–	1	140	**171**
1971	33	0	0	0	33	118	21	–	0	139	**172**
1972	34	0	0	0	34	118	21	2	46	187	**220**
1973	35	0	0	0	35	134	21	4	0	159	**193**
1974	60	0	0	0	60	54	42	4	46	146	**206**
1975	76	0	0	0	76	52	42	4	0	98	**174**
1976	98	0	0	0	98	63	42	4	46	156	**253**
1977	98	0	0	3	101	87	42	4	46	180	**280**
1978	31	0	0	29	60	87	42	4	0	134	**193**
1979	56	0	0	27	83	74	42	4	0	120	**203**
1980	56	0	0	0	56	145	42	4	46	237	**293**
1981	56	0	0	5	61	148	42	4	46	240	**301**
1982	0	4	0	7	10	131	42	4	0	178	**188**
1983	0	4	0	10	15	157	0	–	79	236	**251**
1984	10	4	0	15	30	119	4	–	79	202	**232**
Total	799	12	0	97	908	2019	521	41	434	3015	**3923**

Indonesia

1959	–	0	0	0	–	0	0	0	0	0	–
1960	–	0	0	0	–	0	0	0	0	0	–
1961	–	0	0	0	–	0	0	0	0	0	–
1962	–	0	0	0	–	0	0	0	0	0	–
1963	–	0	0	0	–	0	0	0	0	0	–
1964	–	0	0	0	–	0	0	0	0	0	–
1965	–	0	0	0	–	0	0	0	0	0	–
1966	–	0	0	1	1	0	0	0	0	0	**1**
1968	0	0	0	1	1	0	0	0	0	0	**1**
1970	0	0	0	1	1	0	0	0	0	0	**1**
1974	1	0	0	0	1	0	0	0	0	0	**1**
1975	1	0	0	0	1	0	0	0	0	0	**1**
1976	1	0	0	2	2	3	0	0	0	3	**5**
1977	0	0	0	2	2	3	0	0	0	3	**5**
1978	0	0	0	2	2	4	0	0	0	4	**7**
1979	0	0	0	3	3	4	0	0	0	4	**7**
1980	0	0	0	1	1	4	0	0	0	4	**5**
1981	0	0	0	0	0	11	0	0	0	11	**11**
1982	0	0	0	0	0	11	0	0	0	11	**11**
1983	0	0	0	0	0	17	0	0	0	17	**17**
1984	0	0	0	0	0	10	0	0	0	10	**10**
Total	3	0	0	11	14	67	0	0	0	67	**81**

Israel

1961	0	0	0	0	0	6	0	0	0	6	**6**
1962	0	0	0	0	0	6	0	0	0	6	**6**
1963	0	0	0	0	0	6	0	0	0	6	**6**
1964	0	0	0	0	0	6	0	0	0	6	**6**
1968	0	0	7	0	7	0	0	0	0	0	**7**
1969	0	0	10	0	10	0	0	0	0	0	**10**
1970	0	0	34	0	34	0	0	0	0	0	**34**
1971	0	1	34	0	35	0	0	0	0	0	**35**
1972	85	15	34	0	134	0	0	0	0	0	**134**
1973	124	15	34	28	201	0	0	0	0	0	**201**
1974	167	15	34	28	245	0	0	0	0	0	**245**
1975	104	15	34	28	181	0	0	0	0	0	**181**

Appendix 1—*continued*

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	**Total**
1976	77	18	34	0	129	0	0	0	0	0	**129**
1977	77	9	31	35	152	0	0	0	13	13	**164**
1978	77	21	37	26	162	0	0	0	13	13	**175**
1979	81	28	39	43	190	0	0	0	13	13	**203**
1980	85	35	39	33	192	0	0	0	13	13	**205**
1981	146	39	58	37	280	0	0	0	13	13	**292**
1982	148	47	69	19	282	0	0	0	13	13	**295**
1983	158	54	73	19	304	0	0	0	5	5	**309**
1984	83	63	77	19	242	0	0	0	0	0	**242**
Total	1412	374	679	315	2780	25	0	0	80	105	**2885**
Korea, North											
1953	0	0	0	0	0	0	0	0	–	–	–
1954	0	0	0	0	0	0	0	0	–	–	–
1955	0	0	0	0	0	0	0	0	–	–	–
1956	0	0	0	0	0	0	0	0	–	–	–
1957	0	0	0	13	13	0	0	0	0	0	**13**
1958	0	0	0	14	14	0	0	0	0	0	**14**
1959	0	0	0	14	14	0	0	0	0	0	**14**
1960	0	0	0	6	6	0	0	0	0	0	**6**
1961	0	0	0	6	6	0	0	0	2	2	**8**
1962	0	0	0	6	6	0	0	0	2	2	**8**
1963	0	0	0	7	7	0	0	0	2	2	**9**
1964	0	0	0	7	7	0	0	0	0	0	**7**
1965	0	0	0	7	7	0	0	0	0	0	**7**
1966	0	0	0	9	9	0	0	0	0	0	**9**
1967	0	0	0	15	15	0	0	0	0	0	**15**
1968	0	0	0	13	13	0	0	0	0	0	**13**
1969	0	0	0	6	6	0	11	0	0	11	**17**
1970	0	0	0	6	6	0	11	0	0	11	**17**
1971	0	0	0	0	0	0	11	0	0	11	**11**
1972	0	0	0	0	0	0	11	0	0	11	**11**
1973	0	0	0	0	0	0	11	0	0	11	**11**
1974	0	0	0	5	5	0	11	0	0	11	**16**
1975	0	0	0	14	14	0	22	0	43	65	**79**
1976	0	0	0	29	29	11	22	0	0	34	**63**
1977	0	0	0	19	19	0	22	0	14	36	**56**
1978	0	0	0	19	19	0	22	0	0	22	**41**
1979	0	0	0	29	29	0	22	0	14	36	**65**
1980	0	27	0	16	43	0	0	0	14	14	**58**
1981	0	27	0	22	49	0	0	0	14	14	**64**
1982	0	27	0	17	44	0	0	0	14	14	**58**
1983	0	27	0	17	44	0	0	0	0	0	**44**
1984	0	27	0	15	42	0	0	0	0	0	**42**
Total	0	136	0	331	467	11	177	0	120	308	775
Korea, South											
1963	0	0	0	0	0	0	0	0	1	1	**1**
1964	0	0	0	0	0	0	0	0	1	1	**1**
1965	0	0	0	0	0	0	0	0	1	1	**1**
1971	0	0	0	1	1	0	0	0	0	0	**1**
1972	0	0	0	1	1	0	0	0	0	0	**1**
1973	0	0	0	–	–	0	0	0	0	0	–
1974	0	0	0	1	1	0	0	0	0	0	**1**
1975	0	0	0	2	2	–	0	0	0	–	**2**
1976	0	0	0	3	3	–	0	0	0	–	**3**
1977	0	0	0	2	2	0	6	0	32	38	**40**
1978	0	0	0	1	1	2	8	0	11	20	**22**
1979	0	0	0	0	0	2	8	0	49	58	**58**
1980	0	0	0	0	0	3	8	0	23	34	**34**
1981	0	0	0	56	56	3	8	0	2	13	**69**
1982	0	0	0	23	23	10	8	0	0	18	**40**
1983	0	0	0	24	24	32	5	0	0	37	**61**
1984	0	0	0	86	86	51	5	0	0	56	**142**
Total	0	0	0	201	201	103	54	0	120	277	**478**

Appendix 1—*continued*

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	**Total**
Madagascar											
1974	0	0	0	0	0	0	0	0	–	–	–
Malaysia											
1976	0	0	0	0	0	0	0	0	5	5	**5**
1977	0	0	0	1	1	0	0	0	2	2	**4**
1978	0	0	0	3	3	0	0	0	2	2	**4**
Total	0	0	0	4	4	0	0	0	9	9	**13**
Mexico											
1959	0	0	0	2	2	0	0	0	0	0	**2**
1960	0	0	0	–	–	0	0	0	0	0	–
1961	0	0	0	–	–	0	0	0	0	0	–
1962	0	0	0	1	1	0	0	0	0	0	**1**
1966	0	0	0	–	–	0	0	0	0	0	**0**
1968	0	0	0	–	–	0	0	0	0	0	**0**
1976	0	0	0	0	0	0	0	0	1	1	**1**
1979	0	0	0	0	0	0	0	0	3	3	**3**
1980	0	0	0	0	0	0	0	0	3	3	**3**
1982	0	0	0	0	0	0	0	0	1	1	**1**
1984	0	1	0	0	1	0	0	0	0	0	**1**
Total	0	1	0	4	5	0	0	0	7	7	**12**
Pakistan											
1977	0	0	0	0	0	8	0	0	0	8	**8**
1978	0	0	0	0	0	10	0	–	0	11	**11**
1979	0	0	0	0	0	10	0	–	0	11	**11**
1980	0	0	0	0	0	10	0	0	0	10	**10**
1981	0	0	0	0	0	10	0	0	0	10	**10**
1982	0	0	0	0	0	3	0	0	0	3	**3**
1983	0	0	0	0	0	3	0	0	0	3	**3**
1984	0	0	0	0	0	3	0	0	0	3	**3**
Total	0	0	0	0	0	56	0	1	0	57	**57**
Peru											
1959	0	0	0	6	6	0	0	0	0	0	**6**
1966	0	0	0	6	6	0	0	0	0	0	**6**
1968	0	0	0	5	5	0	0	0	0	0	**5**
1969	0	0	0	5	5	0	0	0	0	0	**5**
1971	0	0	0	4	4	0	0	0	0	0	**4**
1972	0	0	0	0	0	0	0	0	–	–	–
1976	0	0	0	0	0	0	0	0	1	1	**1**
1978	0	0	0	6	6	0	0	0	0	0	**6**
1980	0	0	0	6	6	0	0	0	0	0	**6**
1982	0	0	0	0	0	0	0	0	6	6	**6**
1984	0	0	0	0	0	0	0	0	42	42	**42**
Total	0	0	0	38	38	0	0	0	50	50	**87**
Philippines											
1974	0	0	0	0	0	1	0	0	0	1	**1**
1975	0	0	0	0	0	2	0	0	0	2	**2**
1976	0	0	0	0	0	3	0	0	0	3	**3**
1977	0	0	0	0	0	1	0	0	0	1	**1**
1978	0	0	0	0	0	1	0	0	0	1	**1**
1979	0	0	0	0	0	1	0	0	0	1	**1**
1980	0	0	0	0	0	1	0	0	0	1	**1**
1981	0	0	0	0	0	1	0	0	0	1	**1**
1982	0	0	0	3	3	3	0	0	0	3	**5**
1983	0	0	0	0	0	3	0	0	0	3	**3**
1984	0	0	0	0	0	3	0	0	0	3	**3**
Total	0	0	0	3	3	20	0	0	0	20	**22**

Appendix 1—*continued*

	Indigenous production					Licensed production					
	Aircraft	Armoured vehicles	Missiles	Ships	Total	Aircraft	Armoured vehicles	Missiles	Ships	Total	**Total**
Senegal											
1976	0	0	0	–	–	0	0	0	0	0	–
Singapore											
1968	0	0	0	0	0	0	0	0	1	1	**1**
1969	0	0	0	0	0	0	0	0	1	1	**1**
1971	0	0	0	0	0	0	0	0	28	28	**28**
1974	0	0	0	0	0	0	0	0	8	8	**8**
1975	0	0	0	2	2	0	0	0	9	9	**11**
1976	0	0	0	0	0	0	0	0	8	8	**8**
1977	0	0	0	0	0	0	0	0	4	4	**4**
1978	0	0	0	0	0	0	0	0	7	7	**7**
1979	0	0	0	0	0	0	0	0	18	18	**18**
1981	0	0	0	–	–	0	0	0	0	0	–
1983	0	0	0	1	1	0	0	0	0	0	**1**
1984	0	0	0	3	3	0	0	0	26	26	**29**
Total	0	0	0	6	6	0	0	0	112	112	**118**
South Africa											
1966	0	0	0	0	0	0	7	0	0	7	**7**
1967	0	0	0	0	0	0	11	0	0	11	**11**
1968	0	0	0	0	0	5	11	0	0	16	**16**
1969	0	0	0	0	0	8	11	0	0	20	**20**
1970	0	0	0	0	0	10	11	0	0	21	**21**
1971	0	0	0	0	0	10	11	0	0	21	**21**
1972	0	0	0	0	0	10	11	0	0	21	**21**
1973	0	8	0	0	8	71	0	0	0	71	**79**
1974	0	8	0	0	8	75	0	0	0	75	**83**
1975	–	11	0	0	11	72	0	0	0	72	**84**
1976	–	32	–	1	33	133	0	0	0	133	**166**
1977	–	30	–	0	31	72	0	0	0	72	**103**
1978	1	30	–	0	31	23	0	0	15	38	**69**
1979	1	33	0	0	34	11	0	0	15	26	**60**
1980	1	47	–	0	48	11	0	0	15	26	**74**
1981	1	49	–	0	50	11	0	0	0	11	**61**
1982	1	56	–	0	57	11	0	0	0	11	**68**
1983	1	60	–	0	61	0	0	0	44	44	**105**
1984	0	57	–	0	57	0	0	0	15	15	**72**
Total	5	421	3	1	429	536	75	0	103	714	**1143**
Sri Lanka											
1980	0	0	0	1	1	0	0	0	0	0	**1**
1981	0	0	0	–	–	0	0	0	0	0	–
1982	0	0	0	–	–	0	0	0	0	0	–
1983	0	0	0	2	2	0	0	0	0	0	**2**
1984	0	0	0	2	2	0	0	0	0	0	**2**
Total	0	0	0	5	5	0	0	0	0	0	**5**
Taiwan											
1968	0	0	0	0	0	0	0	0	0	0	**0**
1969	0	0	0	0	0	8	0	0	0	8	**8**
1970	0	0	0	0	0	10	0	0	0	10	**10**
1971	0	0	0	0	0	10	0	0	0	10	**10**
1972	0	0	0	0	0	10	0	0	0	10	**10**
1973	0	0	0	0	0	10	0	0	0	10	**10**
1974	0	0	0	0	0	17	0	0	0	17	**17**
1975	0	3	0	0	3	36	0	0	0	36	**38**
1976	0	4	0	0	4	88	0	0	0	88	**92**
1977	0	6	0	0	6	79	0	0	0	79	**85**
1978	13	7	0	0	20	79	0	0	0	79	**98**
1979	13	7	0	0	20	81	0	0	11	92	**112**
1980	14	7	0	0	21	81	0	10	3	94	**115**
1981	14	7	1	0	21	79	0	12	24	115	**137**
1982	0	19	–	0	20	48	0	12	24	84	**104**
1983	0	19	1	0	20	62	0	12	24	98	**118**
1984	3	22	1	0	26	29	0	10	24	63	**89**
Total	57	99	2	0	159	724	0	56	112	892	**1051**

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