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M A Razzak

ATTRIBUTES OF NAVAL EXPENDITURE AND ITS EFFECT ON NAVAL CAPABILITY: A PERCEPTION

Abstract

Irrespective of the shape and size, navies are expected to perform three principal functions - military, diplomatic and policing. Among these, military function is the prime business of the navies. In this functional hierarchy 'naval capability' plays a decisive role. The capability of navy emanates from its development, which is capital intensive and expensive combined with time and resource. The paper deals with the attributes of naval expenditures and their effect on naval development with reference to developing countries. The author argues that constrained by domestic environment that tends to contain the expenditure, many developing countries' navies are confined to coast guard and nation building responsibility while true military function eventually remains beyond its power capability. In this backdrop, the paper suggests that the navies of the developing countries should strike a balance between the availability of fund and capability requirement.

M A Razzak is a Commander in Bangladesh Navy.

INTRODUCTION

In a world of 188 politically independent states, 165 have navies with different shape, size, and capability. Their shape, size and capability vary from global power projection force to token navy. Irrespective of the shape and size, navies are expected to perform three principal functions - military, diplomatic and policing. Among these, military function is the prime business of the navies. Military function is concerned with the offshore tasks in hostile maritime environment while gunboat diplomacy is primarily a deterrent function in support of political diplomacy. In essence, military function and gunboat diplomacy go hand in hand with changes in time and space. Policing function is about the enforcement laws and regulation of the coastal states. In this functional hierarchy, 'naval capability' plays the decisive role.

The capability of navy emanates from its development, which is capital intensive and expensive combined with time and resource. The expensive orientation of the navy is predominantly contributed by the domination of technology. In their (developing countries) endeavour to attain required naval capability, both domestic and international environment influence navies development. Domestic environment tends to contain the expenditure while international environment burdens the fund at navy's disposal. As a result, the functions of many developing countries' navies are confined to coast guard and nation building responsibility while true military function eventually remains beyond its power capability.

With this short introduction, this paper attempts to offer an insight into the attributes of naval expenditures and its effect on naval development with reference to developing countries.

The paper first touches upon the fundamentals of naval expenditure. Then it deliberates on how domestic politics affect allocation to navy. Having discussed these factors, it identifies the influence of international environment on naval expenditure and development as well. Then the paper determines the product of the financial input. While evaluating the attributes of naval expenditures, it also looks into the permanent operating cost of naval acquisition and evaluates the essentials of cost benefit analysis. Naval expenditure, like other defence outlays, having a perception of opportunity cost in common, the paper also looks into the tangible and intangible economic benefit of naval expenditure. Finally, the paper ponders on the economy of naval expenditures in relation to power capability.

Fundamentals of Naval Expenditure

Fundamentals of naval expenditure constitute three arms of a triangle- maritime strategy, resource and instrument; and revolve around the political axis of the country. These elements do not prevail as independent entity, rather they are interrelated. Weakness in one element proportionately affects the next in the chain. These elements are comprised of certain components. For example, maritime trade, sea resource, maritime weakness, international politics and international interaction converge into maritime strategy and the decision making process of navy's mission. Having defined the mission to protect national maritime interests, money is allocated for the acquisition of instruments. Availability of money depends on the resource of the country. Money, in other words, the economic resource, when adequately available maintains the equilibrium between the strategy and instrument. On the other hand economic shortfall contains naval growth.

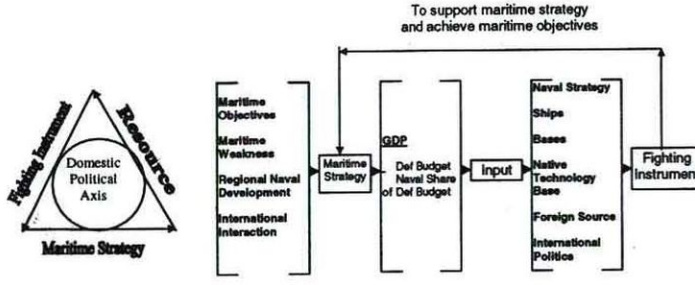

Figure 1

In the relationship as shown in Figure-1, maritime strategy is the fundamental input factor. The input sources are moneymaking organs of the country, private or public enterprises. These organs are not shown separately as their contributions converge into GDP. Money allocated is spent to acquire naval instruments to enforce the maritime strategy to achieve maritime objectives. In the competition for fund in resource constraint economies of developing countries, the allocation to navy is affected by many factors, primarily by the domestic politics and inter services competition for funds.

Domestic Environment: Effect on Allocation to Navy

"Defence budgets are traditionally the target of cost reductions in peacetime because of public perception that military programmes are too costly in terms of their overall contribution to the national economy while diverting funds that might be better spent on social needs."[1] Naval expenditure has a few more negative points compared to army and

1. *International Military and Defense Encyclopedia*, Vol. I, Brassey's (inc) USA, p. 413.

airforce. First is the capital-intensive orientation. Second is the huge unit cost of ship. Third is the effect of inflation. Generally defence inflation is higher than ordinary inflation. The rate of inflation in the navies is higher than armies, as naval expenditures are more capital intensive. Among the armed forces, airforce has the worst rate of inflation. But due to airforce's low unit cost compared to navy, politically it is damaging. The damaging effect in the navy compounds further due to long lead-time in ship construction and involvement of companies of a number of countries. No ship building industry is self-sufficient to produce all equipment needed to put into a ship. The long lead-time and uncertainty of market forces around the world make the fund susceptible to demand pull and cost push inflation. All these factors put naval share of defence budget in a disadvantageous position.

In the domestic politics of developing countries, army leadership generally has overriding say in defence affair. In Pakistan, General Ayub Khan wielded great influence on many Pakistani politicians[2]. The resultant effect was a little allocation for navy from defence budget[3]. "The great business of the navy is conducted out of sight of the people and politicians. This, according to naval officers, is the reason why their navies are always smaller than they should be. However, rather than fighting this disadvantage unsuccessfully for decades, it might make better sense to live with it, and select a role closer to that of army and the airforce"[4]. The suggestion

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2. Pakistan Navy History Section, *Story of Pakistan Navy*, Islamabad, 1991, p. 162.

3. Major General Fazal Muqeem Khan, "Pakistan Navy in War,: in *A Navy and Its Nation At War*, Commodore Ranjit Rai (ed), Lancer International, New Delhi, 1987, p. 169.

4. Rear Admiral Raja Menon, *Maritime Strategy and Continental Wars*, Frank Cass Publishers, London, 1998, p.185.

does not mention what role can be selected to get closer. It is rather more convincing that "Ensuring the safety of the sea lanes, which has been trotted out as a navy's bread and butter, fails to ignite the politicians imagination.... Indeed the safety of sea lanes can not be ignored,.... when up to 40 percent of GNP of some nations consists of overseas trade. The problem is that in the competition for funds in any capital, a threat is not good enough to extract funds; there are always competing threats."[5]

In the prevailing threat environment, people tends to focus on visible threat, which is usually continental in nature. Since WW-II, there has been more fights on land than at sea. "During the period between 1945-1976 a total of 120 armed conflicts took place on the territories of 71 countries involving 84 countries"[6]. On the other hand "Since 1945 there has been one real naval war, half a dozen rather one-sided naval contribution to operations on land, and more than 200 political applications of limited naval force"[7]. Despite more political application of force at sea than on land, the events on land due to its visible intensity became politicians' immediate concern. As a result, priority of allocation goes to other arms. Navies of the developing countries are dependent on foreign sources for wide varieties of their requirements. In this global dependence, the changing international environment, particularly international politics burden the naval expenditures in a big way.

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5. *Ibid.* p.185.

6. Abdur Rob Khan and Mohammad Humayun Kabir, "The Security of Small States: A Framework of Analysis", in M Abdul Hafiz and Abdur Rob Khan (eds) *Security of Small States*, University Press Limited, Dhaka, 1987, p. 3.

7. James Cable, "Gunboat Diplomacy", *International Military and Defense Encyclopedia*, Vol III, p. 1135.

Effect of International Environment on Naval Expenditure

Technological Development: Navy is a technology-dominated service. The weapon system in association with support services constitutes capability. In a world where technological superiority significantly, sometimes decisively influences the course of war, therefore, factors affecting the naval acquisition need to be discussed. Since WW-II, advancement in naval technology has transcended all the reforms of mankind. The development has increased the endurance of naval platforms many times and also the depth and lethality of weapons making the war at sea sharp and short. Technological advancement is accompanied by high price tag often beyond the reach of the developing countries. The financial difficulties limit their option within low cost equipment. Another problem in acquisition is the production policy of the manufacturers. To keep money flowing in and to attract customer by offering better equipment in competitive market, they take recourse to changes in production line. Consequently countries with inferior or old equipment are striken with 'obsolescence' and sooner 'obsolete'.

International Politics: Besides price hike, international politics further complicates naval acquisition. Arms producing government's foreign policy, which has political motivation, regulates the sale of military hardware despite its business orientation. After the departure of former USSR from Afghanistan in 1988, Pakistan's front-line state status to USA, disappeared. US concern for nuclear proliferation overrode communism[8]. Pressler Amendment on US military aid to Pakistan passed by the Congress in August 1985, imposed in October 1990, required Pakistan to qualify a certification by the US President that Pakistan did not possess a nuclear

8. *Asian Defence Journal* 11/95, p. 48.

device. Pakistan for obvious reason never qualified. After the enforcement of the bill, USA in 1992 withdrew 8 frigates and one repair ship on lease to Pakistan. The situation virtually confined her navy's surface force near to land. Before the Falkland war, Argentina received first consignment of Exocet but after the outbreak war, France stopped further delivery. Navy's acquisitions from one source (because cheap price or too friendly source) risks the sea power of the state. Indonesia's high-tech navy in the 1960s once decayed fast following former Soviet Union's withdrawal of technical support as Indonesia sided with Pakistan in Indo-Pak war of 1965. Indonesia could not prevent the decay, as there was no technically based infrastructure to fill in the gap of former Soviet technical assistance.[9] Such conditions cost the navies both economically and in terms of operational readiness.

Allocation to Navy: Relation between Input and Output

Having discussed the factors that influence the allocation and the expenditure, it is essential to discuss the implication of acquisition policy on naval expenditure. Before that it is more pertinent to discuss the product of input i.e. what does money produce in the navy and what is its implication?

Nation's concern in the sea is about its use. Economic use of the sea evokes naval means for protection when threatened. Navy's one of the missions is to protect maritime commerce. Mahan put strong emphasis on the navy's requirement for the protection of shipping. Smaller navies, as an instrument of their governments' foreign policy also perform other missions to withstand the political will against an incumbent threat. Naval mission shifts in time and space and reviewed and adjusted by the states to adapt to politico-military changes.

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9. Harold J. Kearsley, *Maritime Power and the Twenty-first Century*, Dartmouth Publishing Company Limited, England, 1992, p. 112.

Naval missions, in simple words, mean the tasks assigned to the navy by the state. Hence, state, for that matter, the government is the input source for the naval programmes. In between the government and the money allocated to navy, there lie other subsidiary input that generate government's input capability. Paradoxically, while the government is the source of input, it is at the same time also acts as a filter. The elements, those necessitate the government to filter the allocation, are non-military issues of insecurity, namely, poverty, education, health service, social security, housing, pollution control and so forth. However, to provide the required input to commensurate the assigned missions or the tasks that the nation wants the navy to accomplish, the government must view navy's functional mechanism in its proper dynamics. While evaluating the relationship another

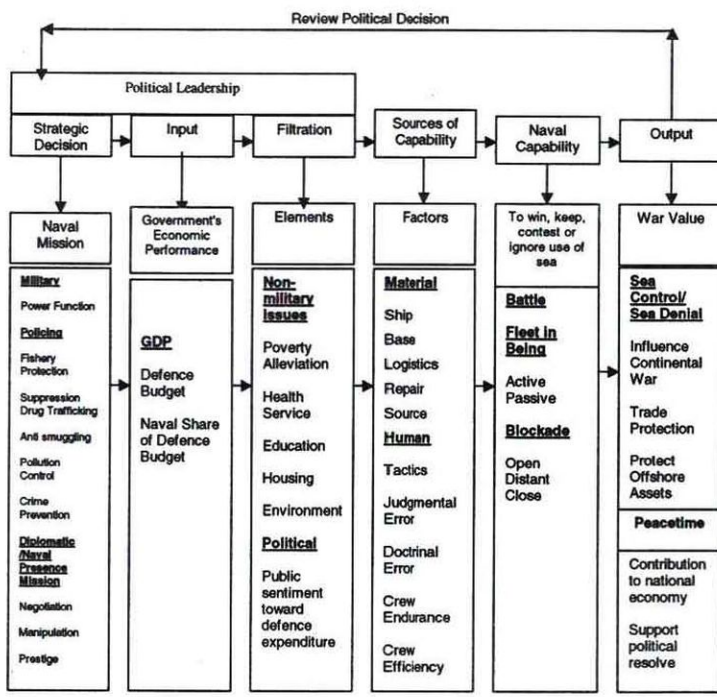

Figure 2

factor comes into consideration i.e. naval capability to challenge a contender at sea. Naval capability derives from the order of battle, weapon selection, human variables in the conduct of an operation, naval logistics etc. Therefore, input's immediate product is the naval capability while output is the actual performance in a mission where the degree of commitment and achievement vary due the ambient elements of war. The relationship between input and output is shown in a flow diagram (Figure 2).

Naval Acquisition and the Permanent Operating Cost

An acquisition of naval platform is the single largest cost in the navy. The acquisition involves operating cost of the ship in different modes, which together with capital cost can be termed as the 'life cycle cost'. The choice of the ship's outfit at the time of acquisition has a great influence on the life cycle cost. The life cycle cost of a manpower-oriented ship fitted with conventional weapon and a ship with minimum manpower requirement but having maximum firepower will differ greatly. There are three general broad areas where expenditures are incurred during the life cycle - manning, operation and maintenance.

The capital cost at acquisition will not change in the life cycle while others are changeable usually having an upward trend. Manning cost includes salary, pension, housing, food, medical services and other associated expenditure. A man's salary at the beginning of his career will grow several times high in 25 to 30 years of service. Add to this, the expenditure incurred on medical services, housing, pension etc. attributed to the family that he has owned during the service.

Operational and maintenance costs also vary. Maintenance cost follows the graph upward while peacetime

operational cost mostly depends on the nature of deployment. It is not possible to estimate the operational cost of a ship employed in war to add to the life cycle cost. During the life cycle, maintenance cost at times shot up due to modernisation programme of the ship. To avoid such expenditure at short interval, selection of ship's outfit should be such that 'obsolete' or obsolescence does not overtake them soon.

The next point is, how will the life cycle cost of ship being procured be calculated? Such estimation shall be derived from the empirical data on another ship of the same type or class of ship in the inventory. Then, what if there is no ship of the same type or class or there is a great difference in the ship's outfit? Among the cost factors discussed above, the expenditure on manpower will follow the similar trend as for others. Likewise, it is also possible to foresee the likely pattern of deployment and so as the expenditure. Therefore, the Life Cycle Cost (lc), Manning Cost (mc), Maintenance Cost (rc) and Operational Costs (oc) can be ascertained as:

$mc = M * l * f_1$ (M is the complement, l is ship's life and f_1 is the expenditure/man/year)

$rc = l * f_2$ (f_2 is empirical data of maintenance cost per year)

$oc = l * f_3$ (f_3 is empirical data of operational cost per year)

$lc = cc + mc + rc + oc$ (cc indicate the capital cost) = y

To understand the impact of acquisition on fleet maintenance, further elaboration is necessary. If y is the value that indicates the total expenditure incurred on a single ship in its life, then its yearly average expenditure (a) can be put into the following equation.

$a = y/l$

Thus, the cumulative figure of all platforms' (in inventory) average yearly expenditure will be the fleet maintenance cost per year. Therefore, larger the force the bigger is the fleet maintenance cost. If the yearly expenditure of all ships is found 'x' (the value of ships' average yearly expenditures i.e. $a_1 + a_2 + a_3 + ... + a_n$) and total number of ship is 'n' ($n_1 + n_2 + n_{3+} ..... + n_n$), then the Fleet Maintenance Cost (fc) will be:

$$\Sigma fc = xn$$

Having ascertained the estimated life cycle cost of an acquisition also the fleet maintenance cost, it is essential to make a cost benefit analysis of the intended acquisition in relation to capability requirement before going for it.

Naval Acquisition: Cost Benefit Analysis of Platforms

To ascertain the cost benefit analysis of naval platforms, a comparison must be drawn between the life cycle cost and the capability of the available options in relation to the requirement of capability. In the evaluation of cost benefit analysis, priority should be attached to ship's capability although the availability of money will have the overriding say in the choice and may perforce suggest a departure from the preferred options. In this imbroglio, a great deal of care is essential to strike a balance between available resource and the requirement of capability.

In the comparison between the life cycle cost and the capability, the theory of probability will determine the resultant value. Because the speed, weapon fit, EW outfit etc. will indicate their possibility to survive in a war and ability to fight. It does not imply that high-tech ships in inventory will not sink. For example, during the Battle of Midway, the Imperial Japanese Navy lost all of its four super carriers to the US Pacific Fleet. During the Falkland war, Royal Navy lost

the billion-dollar ship HMS SHEFIELD. The analysis will help to ascertain the ship's probability to survive and ability to fight. In this of game of probability to survive and fight, a low-tech ship's potentiality to survive and fight ends before the game starts.

Opportunity Cost: Public Perception versus Economic Benefit

Opportunity cost is a negative notion in defence spending. Defence allocation is viewed as tying up resource which otherwise could have been used for other social needs. "The real economic cost of maintaining and using armed forces are other goods and services are foregone"[10]. Gross Domestic Product (GDP) is the accrued economic output of income generating enterprises and institutions-public and private. To measure economic performance of the government and also of the commercial enterprises, money is the available yardstick. Government expenditures in all sectors do not have financial turnover. "Some final goods and services that must be in Gross National Product are not bought and sold in market place, so they are valued at what they cost. Consider the services performed by Government Police protection, fire protection, yet they are an important part of economy's final output. Economists and statisticians have decided to value them at what they cost taxpayers. This, by no means, is ideal, but it is the best practical solution advanced to date"[11]. "National defense is a public good. The benefits of expenditure on national defense extend to the entire nation.

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10. Ken Booth, *Navies and Foreign Policy*, Holmes & Meier Publishers Inc, New York, 1979, p. 199.

11. Edwin Mansfield, *Economics* (fifth edition), W. W. Norton & Company, New York, USA, 1986, p. 132.

Extension of the benefits of national defense to an additional citizen does not mean that any other citizen gets less of these benefits. There is no way to prevent them from this benefit whether they contribute to the cost or not"[12].

Navy, by any means, neither is a commercial enterprise nor it is significantly developed to that extent. Any expectation of financial turnover from the navy is nothing but a fallacy. But it is to be noted that navy's function revolves around nation's maritime economic interest. The protection of nation's maritime economy can be viewed as the best economic benefit. Besides, navies in the developing world perform some tangible and intangible economic role, which are concomitant to its peacetime activity.

In the developing countries, natural calamities devastate the low-lying coasts rendering thousands homeless and destitute. Navy's humanitarian assistance missions accelerate their speedy return to work. Navies as part of their constabulary function carry out anti-smuggling, fishery protection and crime prevention duties at sea. These act as a catalyst to the growth of the country's economy.

The vastness of the sea provides miscreants wide range of opportunities to hide in the mist, haze and beyond the horizon and navy has the exhausting business of finding them. In the quietness of the sea, smugglers find it convenient to push contraband goods in bulk into the local market. In an unguarded or ill protected sea miscreants can have things very much to themselves and can swamp local market with

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12. *Ibid p.* 68.

contraband goods including narcotic drugs and psychotropic substances. This can have a crippling effect on the society and country's industrial growth. It is only possible to assess the value of the seizures that the navy makes but no method is available to value the deterrent effect of navy's policing function and in keeping smugglers and poachers away from venturing obnoxious act. All these can be regarded as peacetime tangible and intangible economic benefit of naval expenditures. For example, Bangladesh Navy during the period between 1985 to July 1997 seized contraband goods worth Tk. 1139 million. Here only the seizure can be valued but not the impact of its peace time role. It is perceivable that the absence of the navies or any law-enforcing agency in any form at sea would have caused irreparable damage on national economy.

Economy of Expenditure: An Outlook

Force Structure: Economising naval expenditure at first instance would imply a cut in budgetary allocation. Down sizing the budget implies force reduction. Such measure comes as a prelude to changing maritime strategy following

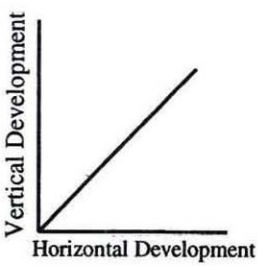

Fig 3

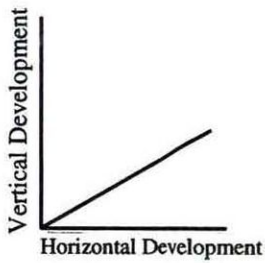

Fig 4

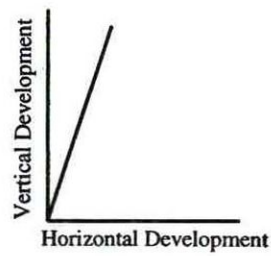

Fig 5

the changes in domestic and international politics and naval development as well. To economise expenditure in relation to the output, it is more appropriate to focus on the balanced growth of three-dimensional capability and their horizontal and vertical development as well. A disproportionate expansion will reduce the efficiency as can be seen in Figures 3.5. For the purpose of study, horizontal expansive consideration includes infrastructure development, recruiting men - conscript or volunteer and their training to operate and support the weapon system in inventory and vertical expansion embodies the efficiency of weapon system i.e. quality and also quantity.

In the developing countries, a balanced growth is difficult a matter owing to financial constraint. Figure 3 shows optimum efficiency that can be achieved through the balanced growth. In Figure 4, more horizontal expansion and less efficient weapon or shortage in quantity reduces resultant output. In Figure 5, more expansion in weapon system and less infrastructure to support the inventory results in imbalance development. This is not the final deduction in the attainment of war efficiency, because the ambient factors of the war i.e. tactics, operating efficiency of weapons at sea, logistics back up etc are also essential ingredients to determine the war making potential of navy. However, this can be regarded as a logical solution in an effort to economise the expenditure in relation to capability.

Weapon Acquisition: Choice of modern weapon is a costly affair. To assess the capability, we count on quality and quantity. To maintain economy of expenditure, a great deal of

care is required in the selection of equipment. It is difficult for a developing country to pay the high cost of weaponry or equipment in one deal. To ease the strain, it may be suggested to pursue purchase on long-term payment basis. This option, due to the effect of inflation, may not have desired result in economic consideration but it will certainly reduce the immediate burden of expenditure. Inventory control is another important area to economise the expenditure. Naval forces maintain inventory of spares, ammunition etc for combat readiness of force, which also includes war reserve and war wastage. Inventory ties up valuable resource of a force which otherwise could have been utilised on other immediate needs.

Arms Production: Another avenue i.e. native technology base can be developed to economise naval expenditure. Indigenous arms production under certain conditions can be cost effective compared to foreign purchase."... countries possessing an arms industry can, by placing and cancelling orders for equipment, use the arms industry as a direct tool in implementing their domestic economic stabilisation efforts."[13] Professor E. Looney reveals that, "Military burden has a strong negative impact on growth in non-arms producing group and a statistically significant and positive impact on growth in the producing countries"[14]. "Many developing countries have hoped that indigenous arms industries would reduce their overall import requirements as a part of a general policy of import substitution industrialization. To these ends,

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13. Robert E. Looney, *Third World Military Expenditure and Arms Production*, St. Martin's Press, New York, 1988, p. 6.

14. *Ibid.*, p. 7.

the build up of domestic arms production capacities can be considered in terms of seven stages"[15]:

a. Arms are imported, but are serviced and maintained domestically.

b. A license to produce arms is required and production facilities are built, but requiring huge technical and personnel assistance from supplier.

c. Production starts and to begin with, involves local assembly of imported sub-assemblies.

d. The sub-assemblies are assembled locally from imported components and sometimes re-exported to the licenser.

e. Components are manufactured locally from imported raw materials.

f. Local production of raw materials.

g. Complete indigenous production including design, raw materials and manufacture.

Developing defence technology base is also capital intensive and expensive and essentially a lengthy process. Success will reciprocate financial return, as defence industries are commercial enterprise unlike defence services. Naval industrial development also inspires small-scale industries to flourish. A warship involves huge material and technology; from missile down to bullet, from main engine down to a centrifugal pump, from hawser down to twine for example.

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15. *Ibid.* p. 103.

Ship building industries do not produce all equipment required to put into a war ship. To have positive economic effect in arms production, it would be appropriate to have military hardware as spin off production from the civilian use of technology.

Conclusion

Armed forces in general are costly affair of the governments. Among the trio of the forces, each has different attributes of expenditure due to very nature of their work. So long the state wishes to maintain the forces, it has to defray the wherewithal to persevere its ability to sustain the political objectives of the governments. The attributes of naval expenditures are different than other branches of armed forces so as the missions of the navies. Nation's desire of the mission achievement should be supported by adequate input to develop the capability. Capability is assessed on the ability to survive and fight. This assessment is quality oriented, however, quantity should not be ignored. While making an acquisition, it is essential to assess its cost benefit analysis in relation to capability requirement and the cost involved in the life cycle of the ship. Ideally qualitative consideration should get priority. In the developing countries, the fate of such priority consideration depends on governments ability to provide fund. But due to financial constraint, navies of the developing countries often make a departure from their priority option. Whether it's a quantitative or qualitative fleet, all incur expenditure in varying magnitude. It will, therefore, be essential for the navies of the developing countries to strike a balance between the availability of fund and capability

requirement. At the same time, the governments should view naval requirement in its proper dynamics if it wants the navy to do the right job. Since money is never available in abundance, it is essential for the navies of the developing world to find ways and means to maintain economy of expenditure so that, money, as much as possible, can be spared for the modernisation of the forces as long as the focus is on the capability of the navy to perform the missions assigned by the nation.