TEETH TO TAIL RATIO
An Archaic Concept
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There are few concepts and expressions which have been blatantly misused as ‘teeth to tail ratio’ to determine efficiency of a fighting force. It is a much abused term to further subjective agenda of some sections of society. Strangely enough, even the militaries tend to use this expression without defining it or understanding its implications.

The concept of ‘teeth to tail ratio’ was initially propounded by the corporate world after the Great Depression to describe market competitiveness of a product. It was used to describe ratio between the cost of production of a product to its overheads like advertising, distribution and organisational expenses (collectively called transaction costs). As there was limited scope in the reduction of production costs, efforts were directed towards reducing overheads. It was considered to be an area in which major reforms could be carried out to curtail expenses. Hence, production expenses were called the ‘teeth’ while all overheads were grouped together as ‘tail’. It was a very apt measure for costing purposes.

Over a period of time ‘teeth to tail ratio’ concept came to be applied to a much larger canvas for measuring overall structural and functional efficiency of companies. The specifics got blurred and its application became a subject of intense debate due to skewed interpretation of what actually constitutes teeth and tail.

The concept was first applied to the US forces during World War II to highlight the enormous expenditure being incurred on logistic infrastructure to maintain supplies to the Allied Forces from production bases in the US. The term soon caught the fancy of military thinkers the world over and came to be used loosely to indicate how streamlined the structure of a military was.

The concept was not meant to be a measure of combat effectiveness but was used primarily to demand downsizing of armed forces by reducing surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II. Today, the concept is being variously applied to surplus manpower to affect savings after World War II.

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Identifying Teeth and Tail to Determine the Ideal Ratio

The fundamental question that has defied resolution so far is determination of norms to classify teeth and tail. Let us take a few cases.

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This bizarre logic can be carried to ridiculous lengths by stating that only fighter pilots are the real teeth of an aircraft carrier as they engage in combat and deliver ordnance on enemy positions.

Defence analysts have often distorted it to demand reduction of uniformed manpower. Many of them have little knowledge of modern warfare and consider anyone not wielding a weapon to be a dispensable liability.

The truth is that no one has ever been able to correctly estimate ‘teeth to tail ratio’ for any force. The concept has become totally subjective in nature and every commentator uses it to justify his proposition. Defence analysts have often distorted it to demand reduction of uniformed manpower. Many of them have little knowledge of modern warfare and consider anyone not wielding a weapon to be a dispensable liability.

LIMITATIONS OF THE CONCEPT

There are some major limitations of the concept that prevent its functional application and thereby render it irrelevant to modern day defence structures:

- The concept is wholly manpower-based and has got reduced to counting heads. It is narrow in scope and fails to factor in a large number of variables. It takes a simplistic view of the armed forces and reduces them to a game of numbers. It tends to disregard the import of support services and relegates them to the level of superfluous consumer of resources. It fails to appreciate that effectiveness of the teeth depends on the quality of support extended by the tail.
- It appears that the sole objective of the concept is to seek a reduction in the number of personnel deployed to perform support functions. That is a very naive approach as the functions as such are not analysed. Instead of exploring cost-effective alternatives to existing support functions, it accepts need for their continued performance but with reduced manpower. It is a strange approach devoid of any scientific logic.
- A considerable portion of the defence budget is expended on non-services constituents as well. The concept ignores this aspect totally and no effort is made to question the need for a huge population of non-uniformed personnel thriving on the defence budget. In the US, office of the Secretary of Defence and defence support agencies account for more than 20 percent of the defence budget. Even in India, non-military elements consume considerable part of the defence pie. In India, the total expenditure incurred by just two organisations (Directorate of Quality Assurance and Defence Research and Development Organisation) during the period 2002-06 amounts to a staggering Rs 17099.19 crores. See Figure 1. This amount does not include the expenditure incurred by a number of other departments which are paid from different heads. For example, Defence Accounts Department had a budgetary provision for Rs 534 crores in 2005-06.
High-tech warfare requires a much larger canvas. It must explore national defence. All manpower paid from defence as technological advances have blurred distinction Armed forces can no longer be viewed in isolation ‘teeth to tail ratio’ as applied to the defence forces. such is of secondary importance.

Enhance combat power. Manpower employed as overheads. Savings thus affected could be used to of scarce national resources by support and logistic boxers punch (see box). The fundamental aim of every country should be to reduce consumption of scarce national resources by support and logistic overloads. Savings thus affected could be used to enhance combat power. Manpower employed as such is of secondary importance.

There is thus a need to revisit the concept of ‘teeth to tail ratio’ as applied to the defence forces. Armed forces can no longer be viewed in isolation as technological advances have blurred distinction between uniformed and civilian personnel in national defence. All manpower paid from defence budget is to be considered in totality as they all consume resources.

Aim should be to evolve a concept which can be applied to a much larger canvas. It must explore the level of effective utilisation of defence budget by determining the ratio of consumption of resources by combat troops to expenses incurred on administration, logistics and other support services. Coefficient of Core Consumption provides us with a scientific tool to oversee defence expenditure and suggest corrective measures.

**Coefficient of Core Consumption**

Coefficient of Core Consumption (CCC) is a factor that denotes proportion of consumption of defence resources on military’s core requirements (functions), as its ability to generate combat power are functions of its manpower structure, availability of new weapon systems and force multipliers. Core functions are mission-critical and their implementation has a direct bearing on the outcome of military operations. They need dedicated and focused attention. All other functions fall in non-core category.

CCC is a resource-centric concept and not based on the number of uniformed men alone. It

<table>
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<th>Department</th>
<th>2002-03 (Rs in crores)</th>
<th>2003-04 (Rs in crores)</th>
<th>RE 2004-05 (Rs in crores)</th>
<th>RE 2005-06 (Rs in crores)</th>
</tr>
</thead>
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<tr>
<td>Directorate of Quality Assurance</td>
<td>374.25</td>
<td>336.85</td>
<td>411.82</td>
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<td>Defence Research and Development Organisation</td>
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<td>3443.18</td>
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<td>3382.36</td>
<td>3780.03</td>
<td>4158.94</td>
<td>5777.86</td>
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</tbody>
</table>

Figure 1: Defence Expenditure in Respect of Non-Services Departments
(Source: Annual Reports of Ministry of Defence, Government of India)

- When there is no agreement as to what constitutes teeth and tail, there can never be an agreement on their desirable ratio. Additionally, it is incorrect to consider ‘teeth to tail ratio’ as a constant for any military as a whole. It varies with area, operation and technology:
  - Tail will be much longer for mountain warfare compared to that in the plains.
  - Offensive operations need much longer tail for sustenance and logistic support compared to static defensive operations.
  - High-tech warfare requires a much larger support complement to deliver ordnance on hostile targets accurately.

**Boxer’s Punch**

Maj Gen Mrinal Suman

A General was asked to depose before a committee tasked to review ‘teeth to tail ratio’ of the military. The Chairman commenced by expressing his unhappiness with the long tail, and said, “General, we want more teeth, like the punch of a boxer that lands on the opponent.”

“Yes, Mr Chairman, I understand your concern. You want more punch and less tail,” replied the General.

“Of course, minimum teeth and minimum tail - that is precisely our aim, General.”

“Mr Chairman, a boxer’s punch is certainly teeth. But what about the arm that delivers the punch?”

“Undoubtedly it is a part of the punch and definitely teeth, General”.

“And what about the shoulder that swivels to generate the required force?” queried the General.

The Chairman thought for a while and replied, “I certainly think it is teeth as a soft punch without adequate force is of little effect.”

“Thank you Mr Chairman. But what about the boxer’s body that twists and recoils to dodge opponent’s punch and positions the boxer to deliver the knock-out punch?” the General continued.

“Certainly teeth”, the Chairman responded but was quick to realise the trap that was getting laid. “What are you trying to convey, General?” he asked.

The General took a long breath and said, “Mr Chairman, punch is effective only because the entire body as a whole generates the necessary power and fashions the knock-out blow. Like our boxer military fights as a whole. Every constituent has a well designated role to perform for mission accomplishment. Let us not break its cohesion and sow seeds of dissention with stamps of teeth and tail.”

In the US, office of the Secretary of Defence and defence support agencies account for more than 20 percent of the defence budget. Even in India, non-military elements consume considerable part of the defence pie.
is a true measure and correct reflection of optimum utilisation of defence budget. Endeavour should beto achieve as high a CCC as possible as it indicates control over expenditure on logistics and support overheads. A highly efficient defence structure can have a CCC of 0.7 and more.

As can be seen in Figure 2, militaries having CCC below 0.4 suffer from gross functional and structural deficiencies resulting in sub-optimal utilisation of resources. It reveals unduly large expenditure on functions which do not directly contribute to their combat power. Drastic and extensive measures are needed to improve them. On the other hand, militaries falling in acceptable zone (having CCC 0.4 to 0.7) indicate scope for further reforms. Such militaries are generally well-structured but need upgradation of procedures and processes to spare more resources for improving combat potential.

Every military should aim to spend most on core functions and reduce expenditure on non-core functions. Non-core functions should also have inter-se priority. Curtailing of expenditure should commence with low priority non-core functions. Improvement of CCC has to be a holistic exercise and cannot be limited to human resources alone.

SUGGESTED ROADMAP FOR INDIA
Parliament’s Standing Committee on Defence in its 11th Report has recommended suitable manpower restructuring to trim the ‘teeth-to-tail’ ratio, with a corresponding increase in the use of advanced and sophisticated technology by the armed forces.

As has been seen, ‘teeth to tail ratio’ concept has lost relevance and needs to be consigned to archives. In India, an upper cap on the total number of men in uniform has been laid solely to conserve resources and not because of any shortage of volunteers for the armed forces. India has a surfeit of them. If that be so, it is incorrect to confine study to manpower issues alone. That would tantamount to focusing on secondary issues while neglecting the main concern. If optimum utilisation of allocated resources is the primary objective, India’s thrust should be on identifying functions that consume resources disproportionate to their inter-se importance.

India should adopt Coefficient of Core Consumption model. The first and perhaps the most difficult action to take is to categorise all functions into ‘core functions’ and ‘non-core functions’. Logistic activities within area of operations are also core functions. Mission-criticality is the sole criteria. Even the definition of non-core functions may have to be changed from support functions to a much

THE US EXPERIENCE
Maj Gen Mrinal Suman

It is generally agreed that the US military had ‘teeth to tail ratio’ of 1:1 during the Cold War period. Due to comparatively higher reduction in combat troops subsequently, the ratio has further tilted in favour of the tail. The current estimates put it at 3:7 to 2:11. This figure is for the US forces as a whole and varies across different constituencies - certain high-tech arms are stated to have a ratio of 1:11.

Of the 2.2 million military and civilian personnel employed by the Defence Department, only 14 percent are in combat positions. Office of the Secretary of Defence and defence support agencies account for more than 20 percent of the defence budget. Prior to the Iraq War, a little over 25 percent of the total US Army strength (480,000) formed part of the service’s 10 active-duty combat divisions and only about one-third of each 15,000-man division consisted of actual combat troops.

Excessive expenditure on the tail has been engaging the attention of all military thinkers and planners in the US. A number of expert committees and study groups have attempted to analyse the problem and suggest corrective measures. Highly respected Business Executives for National Security (BENS) Commission on Tail to Tooth Ratio studied the problem at macro-level without getting embroiled in counting heads. Amongst other things, the BENS Commission recommended the following:-

- Outsourcing of non-core functions to promote efficiency, improve services and affect huge savings.
- Reduction of staff at Secretary’s office, Pentagon and other HQ to affect major savings in manpower.
- Modernisation of the Defence Planning, Programming and Budgeting System.
- Implementation of activity based costing and management throughout the Defence Department.

Physically, the “teeth to tail ratio” concept is certainly not an accurate reflection of the current situation in the US military. The US military today is very much focused on mission-critical operations and has streamlined its structure to support those missions. The concept of “teeth to tail” is an outdated one and does not accurately reflect the modern military organisation. It is important for any country with a large military force to focus on core functions and minimise non-core functions to optimise resource utilisation and combat efficiency.
larger spectrum to include all non-combat functions.

Some of the major steps that should be taken are as follows:-

- Undertake macro-level holistic Defence Management Reforms. Operate at concept, policy and higher direction level. Avoid counting heads.
- Carry out objective identification of core and non-core functions. Provide maximum resources for core functions to re-engineer the military to acquire new capabilities. Reduce expenditure on non-core functions.
- Review and downsize Ministry of Defence (including all departments), service HQ and subordinate HQ. All entities paid for by the defence budget must be assessed for their need and value. They must be made accountable for the expenditure incurred by them.
- Exit all non-defence activities like military farms and stud farms. Employing civilians in lieu of uniformed personnel does not reduce tail. It merely shifts it elsewhere as they continue to consume defence resources.
- Integrate training facilities of all the services. Restructure and amalgamate support services to create integrated bodies. Thrust should be on collaborative effort to avoid duplication.
- Upgrade technology and infrastructure.
- And most importantly, outsource maximum non-core functions. Outsourcing of non-core functions has come to be accepted as the most prudent way to affect savings. Outsourcing in its broadest sense refers to contracting out to external agencies certain services and tasks which were earlier performed with internal resources. Outsourcing facilitates enhanced focus on key functions, restricts size of support elements in the military and saves resources. It also utilises facilities and expertise available in civil sector. Outsourcing makes excellent fiscal sense.

CONCLUSION

Every rupee that a nation spares for defence is at the cost of some developmental need and must be expended intelligently to obtain best value for money. Optimum utilisation of the entire defence budget should be the main concern. Defence budget is not expended on the armed forces alone. Undoubtedly they get the major share but considerable funds are allocated to other organs as well. All of them must also be put under a scan, because savings thus affected will release additional funds for enhancing combat potential of the armed forces.

The concept of 'teeth to tail ratio' is not a scientifically developed tool to measure structural efficiency of a force. Its biggest flaw is that it is totally manpower-centric. It completely ignores functions and their inter- se criticality. It thrives on the assumption that manpower employed on support functions can be safely reduced without impairing combat power. It is a highly simplistic logic.

For several years, Indian defense analysts have been calling for pruning the 'tail' to free funds for modernisation of equipment. If utilisation of resources is of primary concern, why not confront the issue directly. The same objective can be better achieved through the adoption of CCC model as it indicates areas in which savings can be affected by adopting innovative measures.

The root challenge is righting the imbalance in the ratio of spending on core functions to that spent on support overheads. Endeavour should be to rationalise and right-size defence structures rather than chase ideal 'teeth to tail ratio', which, in any case, is a misnomer.

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