All military operational planning is oriented towards achieving laid-down objectives and takes into account the need to be able to sustain operations for the required duration. While not elaborating on how these military objectives are identified, suffice it to state that they pave the way for the nation to achieve the desired end-state in any conflict. Further, this end-state will always be a politically determined outcome since cessation of hostilities will only be successfully effected when the belligerents achieve mutually acceptable political understanding and accommodation of their respective interests.

At the strategic level of military planning, the ability of the force to achieve critical objectives that will in turn lead to the successful culmination of a conflict will be influenced by a number of factors. The four critical factors are—the prevailing political context; alliances, both one’s own as well as that of the adversary; capabilities resident in the military forces; and the capacity of the military forces to sustain combat operations at the necessary tempo and intensity for the required period of time. The political aspects of a conflict—context as well as alliances—are almost always beyond the control of the military forces. Resident capabilities are a direct function of a robust capability development process, which is a long term activity that requires a judicious combination of political will and military acumen to be successful. Therefore, it cannot be considered to be fully within the control of the military forces. However, the fourth factor, sustainability, is one that the military forces can directly influence.

So what is sustainability and what are the elements that influence an air force’s ability to sustain operations? The term sustainability is derived from the Latin sustinere (tenere-to hold, sus-up) and the word sustain can mean ‘maintain’, ‘support’ or ‘endure’. At the strategic level, sustainability in relation to military operations could be defined as the ability of the force to continue a given operation indefinitely by replacing the resources that are depleted through usage or adverse enemy action with resources of equal or greater value without degrading the operational capability of the force at any stage. In this context the term resources would encompass both human and materiel resources. At the operational and tactical level, sustainment could be explained as the provision of personnel, logistic, and other materiel support required to maintain and/or prolong operations or combat activities until the successful achievement of laid down objectives.

Sustainability is built on three pillars—resource availability; environmental context of operations; and overall force capability. Resource availability is a function that is not fully within the control of, and also not the complete responsibility of, the military forces. Further, the environmental context is mainly an external factor. However, overall force capability, although indirectly a function of resource availability at the highest level, is a factor that can be adapted to suit the emerging situation and is to a large degree within the control of the military forces. It is apparent that a flexible and adaptable overall force capability is crucial to ensure that the military force encompasses the required level of sustainability.

Overall force capability is the sum total of a number of sub-capabilities or systems that are necessary to create the desired effects when military forces are employed.
The concept of developing overall capability can itself be further broken down into a number of elements, the major ones being—an appreciation of possible future challenges, appropriate threat analysis, consideration of lead-time requirements for a particular capability to mature, technology availability, and force structure. There are a number of other elements—such as the ability of a military force to recruit and retain ‘quality’ people; domestic financial considerations; and the prevailing socio-political condition in the nation—that have a contextual and limited influence in the broader aspects of the development of overall force capability.

Sustainability is built on the sufficiency of the overall capability of the military force and cannot be built at short notice. Therefore, it becomes imperative for the national security planning process to clearly lay down the desired sustainability level that the military force must maintain in order to ensure national security. The long lead-time required to operationally field state-of-the-art capabilities functioning at the cutting edge of technology is far more visible in the case of developing air power capabilities, in comparison to the other domains. Therefore, the need to appreciate emerging future challenges and fostering the necessary capabilities takes on added impetus in the case of air forces. Even though the results of analysis done and decisions made today will only affect the sustainability of an air force after a decade or more, paradoxically there is an added immediacy to planning for the necessary sustainability at an early stage. This planning is different to other longer term plans, such as capital equipment purchases.

In the case of air power, the single most important factor that influences sustainability is ‘critical mass’. An air force that is functioning at critical mass will find it difficult, if not impossible, to imbibe adequate flexibility within the available force and therefore, will always function within a certain constraint. While under predictable circumstances this may not lead to failure, sustainability beyond a minimum timeframe will always be an uphill task, and cannot always be assured. It is clear that in order to have assured flexibility, a critical air power characteristic that ensures that unforeseen contingencies are adequately catered for, air forces will always have to function at a calculated percentage above their critical mass. The optimum application of air power is largely based on the characteristic of flexibility. Foreclosing the option to be flexible, due to functioning at critical mass, will eventually diminish the overall capability of an air force to below optimum level. Such a situation will inevitably lead to long-term failure of an air force.

There is an indelible connection between critical mass and sustainability in air forces. Only forces operating above the critical mass will have the spare capacity available to restore lost capability rapidly and within a stipulated time period in order to ensure that the capability loss does not affect on-going operations. This is relatively easier to achieve if the entire force is not being utilised in a particular operation. However, numerically smaller forces will find sustainability becoming a challenge as soon as the entire force gets deployed or is actively involved in an on-going campaign. Under these circumstances operating at the critical mass is not a viable option.

The calculation of critical mass is a foundational requirement to ensure that the force structure planning of an air force is correct and meets the requirements of the nation. In calculating the critical mass from an air power perspective, the entire air power capabilities resident in the military forces of a nation must be considered. However, critical mass in air power is directly affected by its division along the command and control structure within the individual Services and the joint force. Therefore, a purely academic appraisal of the overall air power capacity of a military force that does not take into account the control divisions of holistic air power capabilities could be misleading in its input to the calculation of critical mass. Since air power is viewed as a single entity in a joint force, ‘penny-packaging’ it through untenable command and control procedures will invariably lead to an air force becoming unable to sustain operations at the required tempo and intensity even while operating above nominally calculated critical mass.

**Key Points**

- **Sustainability is the ability of the force to continue a given operation indefinitely by replacing the resources that are depleted through usage or adverse enemy action.**
- **Overall force capability, resource availability, and environmental context are the three major factors that affect sustainability.**
- **There is an indelible connection between critical mass and sustainability in air forces.**