

Prolonging Operational Reach in Contested Jungle Environments:

Lessons Learned and Recommended Solutions from Recent Operation Pathways Exercises

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Contested logistics in the Indo-Pacific area of operations is an acknowledged complex and unsolved problem set. Though the problem is known, the defined scope is frequently focused on the strategic level flow of commodities from the industrial base to forward staging areas in the operational theater. While significant discussion and solutions are needed to solve the tyranny of distance and inter-theater flow, emphasis must also be placed on the tactical level. The tactical “last mile” presents noteworthy challenges for brigade support battalions (BSBs) and forward support companies (FSCs) that are not designed or adequately equipped to execute in austere jungle environments. The current sustainment force design lends few favors to formations primarily operating in a jungle environment. Successful tactical-level sustainment operations in the Indo-Pacific require adaptation and modernization of the FSC’s posture, methods, and equipment. Without adjustments, support organizations may struggle to consistently sustain maneuver formations in a jungle environment.

Observed Challenges during Execution of Exercises Salaknib and Balikatan 2023

Through years of counterinsurgency conflict, the modern American warfighter has grown accustomed to on-demand sustainment and become reliant on contracted solutions. The jungle environment proves this infeasible with the present sustainment design and capabilities within infantry brigade combat teams (IBCTs). The inability to provide prompt and consistent support becomes problematic due to relentless terrain and dense foliage limiting the warfighter’s range and endurance. Observing the Armed Forces of the Philippines (AFP), coupled with hard-learned lessons in the jungle terrain, maneuver commanders directed Soldiers to reduce the overall weight of



U.S. and Philippine Soldiers conduct a training mission in support of Balikatan 23 at Fort Magsaysay, Philippines, on 21 April 2023. (Photo by LCpl Joseph E. DeMarcus, USMC)

their packs. As a result, Soldiers were limited to only carrying survival and mission-essential items and equipment. Reliance on traditional military rations and contracted purified drinking water reduced operational reach in the jungle. Individually carried rations such as Meals, Ready to Eat (MREs) or First Strike Rations (FSRs) fill valuable pack space and increase the overall weight and Soldier strain. Thus, while conducting tactical movements in unforgiving climates and terrain, there is a considerably higher demand for replenishment of both rations and water. The resupply of purified bottled water from the FSC to maneuver units is cumbersome, slow, and creates an oversized signature. Organic water purification equipment does not exist within an infantry battalion, and individual water purification solutions are inadequate for filtering heavy metals that pollute and flow within some host nation water sources.

BSBs and FSCs are primarily postured and focused on utilizing ground lines of communication (GLOCs), and they are not adequately equipped or trained to pivot to multi-modal means of resupply. Multidomain environments require sustainment operations to support through the air, on waterways, and over the ground. Without posturing to conduct multi-model resupply during conflicts, resupply operations will become predictable and solely dependent on one or two lines of communication. This will hamper and potentially cease resupply operations if enemy capabilities deny the given mode. Sustainment formations in their existing state are not capable of minimizing signature. Large, slow-moving vehicle platforms with robust storage and hauling capacity do not allow for maneuverability in restrictive terrain. Further, sizeable noise and heat signatures nearly ensure detection and interdiction from enemy forces. Competitor advances in long-range precision fires, loiter munitions, and unmanned aerial surveillance will lead to consistent and accurate targeting of sustainment forces, which will likely be a favored course of action, as seen in the Russo-Ukrainian War.

Achieving extensive disruption of supply trains pushing to the front line of troops, the enemy merely needs to out-survive friendly forces. Given this reality, the ability to mask signature, reduce footprint, and operate multi-modally will increase the survivability of sustainers and the warfighters they support. With the broad implementation and use of the Integrated Tactical Network (ITN) and associated communications systems, power generation and distribution weigh heavily on operational reach and endurance. This problem set further compounds with each additional Soldier-wearable technology and fielded sensor system. Solar-power generation solutions are lightweight and portable; however, they require direct and prolonged exposure to sunlight, which can be limited under a jungle canopy. When the jungle environment allows, utilization of vehicle platforms will naturally result in a demand for refueling operations. On its face, this seems to be a simple mission; however, it is likely not the case. Infantry companies within a light infantry battalion predominantly possess High Mobility Multipurpose Wheeled Vehicles (HMMWVs) or smaller platforms, apart from a few Light Medium Tactical Vehicle (LMTV) variants. The FSC and BSB fuel assets are either integrated into, or carried by, the Heavy Expanded Mobility Tactical Truck (HEMTT) platform, which is considerably heavier, larger, and less maneuverable. Therefore, current organic fuel assets cannot be guaranteed to traverse the same path or terrain to reach the required destination. While the unit can shuttle fuel cans or tactically retrograde to conduct refueling operations, this requires pulling Soldiers, weapons, and equipment away from the line and from their primary mission and objective.

Recommended Solutions to Remedy Challenges

Jungle sustainment is a multi-faceted problem set. Numerous equipment acquisitions, training adjustments, and role implementations will profoundly increase our sustainers' effectiveness and survivability in the jungle. Overall, the FSC mission outlook and posture must be forward "pushing." Employing a predominately "pull" system will result in maneuver companies expending their limited on-hand resources faster, drastically interfering with mission focus and accomplishment. Anticipatory resupply and predesignated cache hides will be essential due to the limited capability to conduct emergency resupply. Reimagination and modernization of sustainment-focused equipment will ensure that logistics operations remain unpredictable, and that maneuver does not outpace sustainment. Below is a compiled list of existing products on the market with the potential for immense impacts. These products are available now and offer potential opportunities to fill capability gaps across the sustainment enterprise. None of the statements on the below-listed products stand as or are intended to endorse the associated manufacturer or distributors. Discussion of any product is provided for informational purposes on the types of capabilities needed for success in a jungle environment.



Acquisition and fielding of smaller, more mobile utility task vehicles will allow maneuver companies to remain as far forward in the fight as possible while conducting resupply operations and casualty evacuation. (Photo by SGT Daniel Proper)

- Utility Task Vehicles (UTVs):** Acquisition and fielding of smaller, more mobile UTVs, such as the Polaris MRZR-A or the General Motors Infantry Squad Vehicle (ISV), outfitted and modified for sustainment operations will drastically enhance the reach of sustainment formations. Having the smaller wheelbase capability will bolster the transportation abilities of GLOCs and allow maneuver companies to remain as far forward in the fight as possible while conducting resupply operations and casualty evacuation. This does not suggest a total abandonment of fielded sustainment platforms, as they still have their place in the overall equation. However, utilizing the smaller UTV platforms for pushing forward to the maneuver units, and reserving the larger traditional platforms for hauling bulk commodities and resupply operations with the BSB, will allow for a more dispersed footprint and signature.
- Tactical Resupply Vehicle/Joint Tactical Autonomous Aerial Resupply System:** Utilization of unmanned aircraft systems (UAS) that are designed and configured for autonomous or semi-autonomous sustainment operations allows for increased sustainer survivability and prompt, effective delivery of commodities to the point of need. Incorporation of these systems would enable agile multi-modal forward-pushing sustainment and provide a swift employment capability for reactive emergency resupply delivery. Products such as the Tactical Resupply Vehicle family from SURVICE Engineering and Malloy Aeronautics are among the many embodiments of this concept.
- Small Multipurpose Equipment Transports (S-METs):** S-METs at the company level would significantly bolster dismounted endurance if the environment permits their use. The additional transportation and hauling capacity can be mission configured to maximize needs. Potential implementations include casualty evacuation (CASEVAC), hauling secondary sustainment or fuel loads in a TransCube Tactical 250, and command and control (C2) platforms.
- Battery Banks/Power Packs:** Battery technology is constantly improving; however, the power required to operate communications equipment and Soldier-wearable technology is a considerable burden. Batteries needed for an extended patrol or mission will inevitably become a hindrance and limit maneuver independence and reach.
- Modular Fuel Tanks:** Bulk fuel storage and distribution requirements are unlikely to decrease; instead, they have the potential to increase with the procurement of newer, smaller vehicle platforms that can operate in restrictive terrain. The need for vehicles that can pass through the jungle environment and deteriorated road networks is critical for C2, CASEVAC, and resupply operations. Given this, providing fuel to the point of need is necessary for

sustainment formations. Existing systems are large and cumbersome and require transportation by HEMTTs with load-handling systems. Not only is the likelihood of reaching the desired destination infeasible due to vehicle size and maneuverability, but the probability of being detected and targeted is also higher based on confinement to main supply routes and road networks. Procurement and use of modular fuel tanks, such as the Western Global TransCube Tactical (TCT), allow for various implementations and delivery methods. The TransCube family of tanks ranges in capacity from 250-1,000 gallons. All variations are sling-load capable and double-walled for internal secondary containment. Based on the decreased tank capacity, the required cubic space is minimal, allowing system secondary loading onto several maneuver company vehicle variants. The added benefit of sling-load capabilities allows for swapping fuel units utilizing air assets when required based on ever-changing conditions and current enemy posture.

- **Water Purification:** Potable water will consistently be the notable limiting factor in jungle operations. Contracted solutions are not guaranteed to be available during a crisis or conflict. Additionally, bottled solutions are not conducive for the warfighter due to bulky configurations and excess plastic waste that is noisy and must be retrograded with the unit to avoid leaving an environmental signature. Therefore, purification needs to be the primary course of action. The FSC should possess purification systems similar to the Lightweight Water Purification System (LWPS) from HDT Global. The system allows up to 300 gallons per minute and can scale up to 900-plus gallons per minute based on the mission set. The primary intention for FSC water purification is to create potable water and fill organic water buffalos and camels. Once potable water exists, distribution can utilize sling-load operations or cross-load in 5-gallon water cans and individual water sources. Furthermore, each warfighter should be issued personal water purification devices similar to the LifeStraw, even if the water quality in host nations may not be suitable due to hard metals that individual devices cannot filter. However, personal devices will suffice in emergency situations until potable replenishment is achieved.

Enhancing Training

Successful employment of sustainment forces in a jungle environment also requires specific training and certification to employ all capabilities fully. Increasing the number of sustainers who are air assault, pathfinder, and Sling Load Inspector Certification Course (SLICC) qualified opens the full range of aerial resupply options. Drilling and honing the skills for standard and non-standard sling-load operations must be commonplace and occur regularly. While all three of the above military courses teach Soldiers proper rigging and inspection of sling loads, SLICC also trains and certifies Soldiers on rigging and inspection of low-cost, low-altitude (LCLA) loads. Expanding the aerial resupply repertoire will inherently lead to increased sustainment planning options. While certification and training to achieve multi-modal methods of resupply are necessary, above all, the sustainment community needs to master fundamental Soldier and sustainment skills.



Soldiers conduct low-cost, low-altitude aerial resupply training on Schofield Barracks, HI. (Photo by SGT Sarah D. Sangster)

Commanders at all levels must emphasize the importance of tactical proficiency and the practice of analog systems. With a high probability of contested or denied supply lines across all domains, the likelihood of digital failure and the necessity of analog/mechanical systems will be paramount. Technological advances have made sustainers, now more than ever, incredibly vulnerable to targeting. Refocusing FSC training plans to encompass aspects requiring sustainers to step outside their military occupational specialty (MOS) and perform tactical tasks, understand enemy capabilities, and innovatively problem-solve solutions is vital to survival.

Conclusion

The problem set facing sustainers in a jungle environment is complex and will not be solved by any single equipment acquisition or military course/certification. Innovative thinking and breaking sustainment organizations' traditional roles and responsibilities, while enhancing and tailoring sustainment capabilities to the anticipated conflict environment, will undoubtedly lead to a higher mission success rate. Problems and challenges will continue to materialize, but solutions will arise through a culture of problem-solving and boundary-pushing. Contested supply lines require unpredictable sustainment across the full spectrum of multi-modal supply methods. The challenges and solutions presented here are far from all-inclusive. However, increased discussion and innovation are required to ensure warfighters and sustainers can traverse the austere jungle environment and reach their objective with the supplies and equipment needed to decisively win and exploit success.

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