

Taiwan Lessons Learned from the Russia-Ukraine War

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Abstract

This report examines Taiwan's lessons learned from the 2022 Russian invasion of Ukraine. Lessons learned by Taiwan are already influencing Taiwan's defense strategy and have created a sense of urgency for government leaders. The possibility of an invasion by the People's Republic of China has been an ever-present reality for Taiwan's leaders, but the Russia-Ukraine conflict has provided an opportunity to learn from that experience and enact multifaceted reform with the goal of turning the Taiwan military into a credible deterrent and warfighting force. Taiwan has already begun to restructure its ground forces and lengthen the terms of service for conscripts. The Russia-Ukraine war has also highlighted the role of uncrewed autonomous systems, the need for satellite communications connectivity, and the importance of defending against cognitive warfare operations.

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EXECUTIVE SUMMARY

“Ukraine today, Taiwan tomorrow” is now a commonly used phrase in Taiwan. For decades, Taiwan treated a potential invasion by the People’s Republic of China (PRC) as a remote possibility. However, the 2022 Russian invasion of Ukraine has made a PRC invasion of Taiwan appear more credible and generated a sense of urgency among some leaders in Taiwan. This report examines the lessons learned that Taiwan’s government and defense officials are extracting from Russia’s invasion of Ukraine.

The Taiwan government and military have enacted multifaceted reform with the goal of turning the Taiwan military into a credible deterrent and warfighting force. Although some reform debates predate the Russia-Ukraine war, Taiwan government officials have taken lessons from Ukraine to guide restructuring of Taiwan’s military forces. Changes include lengthening the terms of service for conscripts and revising the military training cycle. The Russia-Ukraine war has also highlighted the role of uncrewed autonomous systems, emphasized the need for satellite communications connectivity, and reinforced the importance of defending against cognitive warfare operations. In this paper, we describe five key lessons learned that the Taiwan government is using to guide its efforts to turn the Taiwan military into a credible deterrent and warfighting force.

Lesson #1: Force structure matters

Ukraine’s Territorial Defense Force serves as a model for Taiwan military restructuring to create a defense in depth and improve deterrence by raising the potential costs of a Taiwan military invasion by the PRC.

Taiwan’s military is in the process of changing its warfighting concept of operations. The previous system, composed of only active and reserve forces, has been replaced by the “all-out defense” system, which includes four pillars: (1) main forces, (2) garrison forces, (3) reserve forces, and (4) civil defense elements. Each pillar has its own missions and areas of responsibility.

Drawing on Ukraine’s experience with its Territorial Defense Force, the **main force** will have better trained and equipped units.

Garrison forces will be made up primarily of conscripts and will be responsible for homeland defense missions, such as protection of cities and key government and military facilities.

In wartime, the **reserve forces** will be mobilized to provide support to main and garrison units.

The **civil defense system** is intended to support military operations, including such tasks as providing medical assistance, performing rapid repair, offering shelter, and maintaining law and order.

The creation of these additional systems is meant to create a defense in depth and improve deterrence by raising the potential costs of a Taiwan invasion.

Despite changes to warfighting concepts, the role of the navy and air force appears relatively unchanged.

Personnel changes, such as the length of service obligations of conscripts, pertain to all three branches of the Taiwan armed forces, but the all-out defense mobilization plans appear to be primarily directed at the Taiwan army.

The Republic of China Navy, according to the 2023 National Defense Report, will continue to “meet its requirements for joint sea control missions,” and the Republic of China Air Force will be responsible for overall air defense operations.

However, it is unclear how personnel and training changes initially focused on the army’s defense in depth will affect how the navy and air force operate, especially given the important role each service has during wartime to deny the ability of the People’s Liberation Army (PLA) to cross the Taiwan Strait and during peacetime to contest PRC gray zone operations.

Lesson #2: Personnel are critical for all-out defense strategy

Taiwan recognizes that well-trained personnel are key to any defense but has not adopted Ukraine’s popular resistance model.

The Russia-Ukraine war demonstrates the importance of having sufficient numbers of well-trained personnel. Taiwan has made the politically unpopular decision to lengthen service commitments for conscripts from four months to one year. The decision to increase conscription service length is intended to increase the number of personnel available for Taiwan’s defense and to make those conscripts better trained.

Despite important personnel changes for the military, the Taiwan government does not appear to support peacetime measures to promote popular resistance. The arming of private citizens runs counter to Taiwan’s strict gun laws, and the formation of private militias would likely raise command and control issues for the Taiwan government and military. Similarly, no source surveyed for this study advocated for the creation of an international volunteers unit such as Ukraine’s International Legion for the Defense of Ukraine.

Lesson #3: Importance of uncrewed systems

Uncrewed systems could increase costs for the PRC and limit the costs for Taiwan.

Taiwan’s government and military have recognized the utility of drone warfare and embarked on an ambitious national drone program. Uncrewed aerial vehicles (UAVs) could potentially inflict costs on the PRC and PLA while limiting losses for Taiwan. The Taiwan military has committed to acquiring more than 700 military-grade UAVs and more than 7,000 commercial grade UAVs by 2028. Considering the heavy attrition of drones in the Russia-Ukraine war, Taiwan may need to significantly expand its acquisition of uncrewed systems to meet wartime requirements. The Taiwan Ministry of National Defense has also sought to acquire counter-UAV systems as part of its larger effort to produce and acquire a variety of UAVs.

Lesson #4: Necessity of connectivity

Satellite communications plans promise to increase resilience and reduce Taiwan’s telecommunications vulnerability.

In 2023, the Taiwan Ministry of Digital Affairs and Chunghwa Telecom both signed agreements with European companies to receive satellite communication services and access low Earth orbit networks. The Taiwan Space Agency has suggested that it may need 120 satellites for resilience, and the Taiwan government has committed to acquiring additional ground-based satellite communication terminals. However, the number of terminals is far below the amount used by Ukraine.

Lesson #5: Cognitive warfare concerns

PRC cognitive warfare activities remain a critical issue for Taiwan.

PRC cognitive warfare activities predate the 2022 Russian invasion of Ukraine and remain a focus of concern for Taiwan authorities. In 2022, former president Tsai Ing-wen called information warfare operations the biggest challenge to Taiwan's survival. Although Taiwan researchers have monitored the Russia-Ukraine war for trends in cognitive warfare, Taiwan's efforts to counter PRC cognitive warfare operations largely draw upon its own experience.

Taiwan government and academic documents do not discuss protracted warfare.

Despite a strong focus on the concerns associated with cognitive warfare, discussions of the likelihood of protracted warfare are not prominent. Taiwan sources surveyed for this report discuss the deterrent and operational advantage of creating a defense in depth, but there is little discussion of Taiwan's options if the conflict should turn into a stalemate. Analysts argue that one reason for a defense-in-depth strategy is to buy time for the US military to actively become involved in defending Taiwan. As the Russia-Ukraine war continues, these observations may change.

Indicators to watch

Predicting national resistance or will to fight is incredibly difficult. However, this study found that Taiwan officials and researchers are taking lessons learned from the Russia-Ukraine war seriously. Indicators to watch to evaluate how Taiwan is applying its lessons learned include the following:

- Progress on implementation of the current military training program
- Additional changes to the length of service requirements for conscripts
- Changes to civil defense systems
- Acquisition and production of commercial and military-grade uncrewed systems
- Increases in ground-based terminals necessary for resilient communications
- Discussions of popular resistance plans, the potential effects of protracted war, or expansion of current mobilization systems

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1. INTRODUCTION

“Ukraine today, Taiwan tomorrow” is now a commonly used phrase in Taiwan.¹ For decades, Taiwan treated a potential invasion by the People’s Republic of China (PRC) as a remote possibility. However, the 2022 Russian invasion of Ukraine has made a PRC invasion of Taiwan appear more credible and generated a sense of urgency among some leaders in Taiwan. This report examines the lessons learned that Taiwan government and defense officials are extracting from Russia’s invasion of Ukraine.

According to Taiwan’s 2023 National Defense Report, the Russia-Ukraine war has taught Taiwan that “a totalitarian regime can ignore international rules and kick off invasion for the sake of its own national interests or political assertions.”²

The Taiwan government and military have enacted multifaceted reform with the goal of turning the Taiwan military into a credible deterrent and warfighting force. Although some reform debates predate the Russia-Ukraine war, Taiwan government officials have taken lessons from Ukraine to guide restructuring of Taiwan’s military forces. Changes include lengthening the terms of service for conscripts and revising the military training cycle. The Russia-Ukraine war also highlighted the role of uncrewed autonomous systems, emphasized the need for satellite communications connectivity, and reinforced the importance of defending against cognitive warfare operations.

Based primarily on Taiwan government and military policy documents and Taiwan military analyst assessments of the Russia-Ukraine war, we argue that the Russia-Ukraine war has resulted in profound changes in Taiwan’s approach to its defense, in large part because of the increased sense of urgency. Based

on these lessons learned, the Taiwan government and military are attempting to reform the Taiwan military into a credible deterrent and warfighting force.

Similarities exist between Ukraine and Taiwan. Both are democracies threatened by the territorial ambitions of a larger and more powerful neighbor. Both have strong linguistic, cultural, and economic ties with their larger neighbor. Important differences also exist between Russia’s invasion of Ukraine and a potential PRC invasion of Taiwan, however. Most notably, Ukraine has land borders, and Taiwan is an island, which both benefits and disadvantages Taiwan. PRC efforts to invade Taiwan would be greatly complicated by the necessity to conduct an amphibious landing on Taiwan’s shores. In contrast, Ukraine’s land borders facilitate international support with the flow of people and supplies, whereas a blockade of Taiwan could cut off the island from material support. Although Ukraine’s sovereignty is supported by many countries, Taiwan’s unique status could limit its ability to garner international support.

Based on study of the Russia-Ukraine conflict, the Taiwan Ministry of National Defense (MND) asserts that Taiwan’s commitment to democracy and freedom will generate support among the international community. According to the Taiwan MND, “the majority of countries have admitted that peace and stability across the Taiwan Strait are connected with peace, stability, and prosperity not only in the Indo-Pacific, but also in the international community.”³ The Taiwan MND also asserts that Taiwan must be able to defend itself for others to come to its aid.⁴

Taiwan has begun to adjust how it will carry out its defense strategy of “effective deterrence,

resolute defense.”⁵ Greater attention is now being placed on creating a defense in depth intended to wear down the People’s Liberation Army (PLA) landing forces on the island if it gains and breaks out of a lodgment on Taiwan.⁶ To carry out this revised approach, Taiwan has restructured the way in which it conceptualizes warfighting by the army, increased service requirements for conscripts, and begun to revamp its training. The Taiwan government has also undertaken an ambitious program to develop uncrewed capabilities, strengthen efforts to combat PRC cognitive warfare operations, and make its command and control (C2) system more resilient through space-based communication systems.

Although it is too soon to evaluate the effectiveness of these reforms, we identify the main reform efforts in order to outline a research agenda, and we discuss indicators to watch. Indicators include the acquisition of uncrewed and satellite communication systems, societal acceptance of changes to the conscription system, and the emphasis on reserve, garrison, and civil defense forces to support the military in the event of conflict.

Approach and organization

This CNA-initiated project conducted an initial review of Taiwan official and military writings related to analysis of the Russia-Ukraine war. At its core, our main research question was as follows: what lessons learned have Taiwan analysts gathered and assessed related to the Russia-Ukraine conflict? Initial research focused on vernacular primary source materials from Taiwan, including a survey of official government documents and military journals. We consulted materials on Taiwan’s general defense strategy, defense structure, drone warfare, cognitive and information warfare, use of reserve forces, satellite communications, and logistics war.

Given the limited scope of this project, more materials were available than we could translate, analyze, and evaluate. Yet, our initial review indicates there is a robust literature that should be used for future research. The appendix provides an abridged version of the main sources used for this report.

We recognize that many elements of these topics have been previously discussed and thus are not entirely new. We focused on topics that directly reflect observations from the Russia-Ukraine conflict and appear to have a sense of urgency associated based on actions taken in the past two years. However, this paper is not an evaluation of the status, effectiveness, or viability of any of these reforms—we simply mention the items directly relevant to topics identified as Russia-Ukraine lessons learned. Thus, to assess the importance of key topics, we asked a secondary research question: of the topics considered by Taiwan military and government researchers, in what areas have we already seen substantive changes that appear to be driven by observations garnered from the Russia-Ukraine conflict?⁷

We cite approximately 80 sources, and of those documents, more than half are primary source materials from Taiwan, and nearly all were published between 2022 and 2024.⁸ For some topics, such as cognitive warfare and satellite communications, we supplemented the military journals with media reporting on those topics, using global news outlets and Taiwan-based media sources.

We then organized the paper according to the five categories of lessons learned: structural reforms, personnel issues related to all-out defense mobilization, uncrewed systems, satellite communications, and cognitive warfare. Within each of these categories, there are multiple more specific lessons learned. We outline areas in which

Taiwan appears to be implementing its learning (force structure, personnel changes) and areas that could be pursued. In other instances, such as cognitive warfare, the Ukraine experience has been examined, but Taiwan is following its own path. To be clear, this is only an initial assessment, and much more work could be done on these issues in terms of analyzing the primary source discussion and in terms of evaluating whether and how those reforms are being implemented. Our list of indicators in the conclusion notes an initial list of items that should be monitored to evaluate whether and how Taiwan is evolving based on its lessons learned from Ukraine.

2. STRUCTURAL REFORM




Taiwan has begun restructuring its armed forces to create a defense in depth. In December 2022, eight months after the Russian invasion of Ukraine, the Taiwan government announced the “Strengthening the All-Out Defense Force Structural Adjustment Plan” that adjusted Taiwan’s national defense structure from a regular and reserve-based military structure to one composed of main, garrison, reserve, and civil defense forces.⁹ While keeping the three services intact (army, navy, air force), the restructuring reshapes the way in which Taiwan’s military, in particular the army, organizes its defense.

The Taiwan armed forces are now restructured under a system involving four forces: main forces, garrison forces, reserve forces, and civil defense forces. Under this new structure, main force units will be the primary force defending the island. In this role, the main force will attack PLA units crossing the Taiwan Strait and landing on the beaches.

According to the 2023 National Defense Report, this system will be continually adjusted to promote joint C2, early warning, long-distance precision strike, and rapid response.¹⁰ Under this system, Taiwan’s military is composed of 169,000 active duty personnel backed up by more than 1.6 million veterans serving as reservists (see Figure 1).¹¹ Active duty units are made up of a mix of volunteers and conscripts, who would serve four-month tours. The reservist force would form as units or augment active duty units.

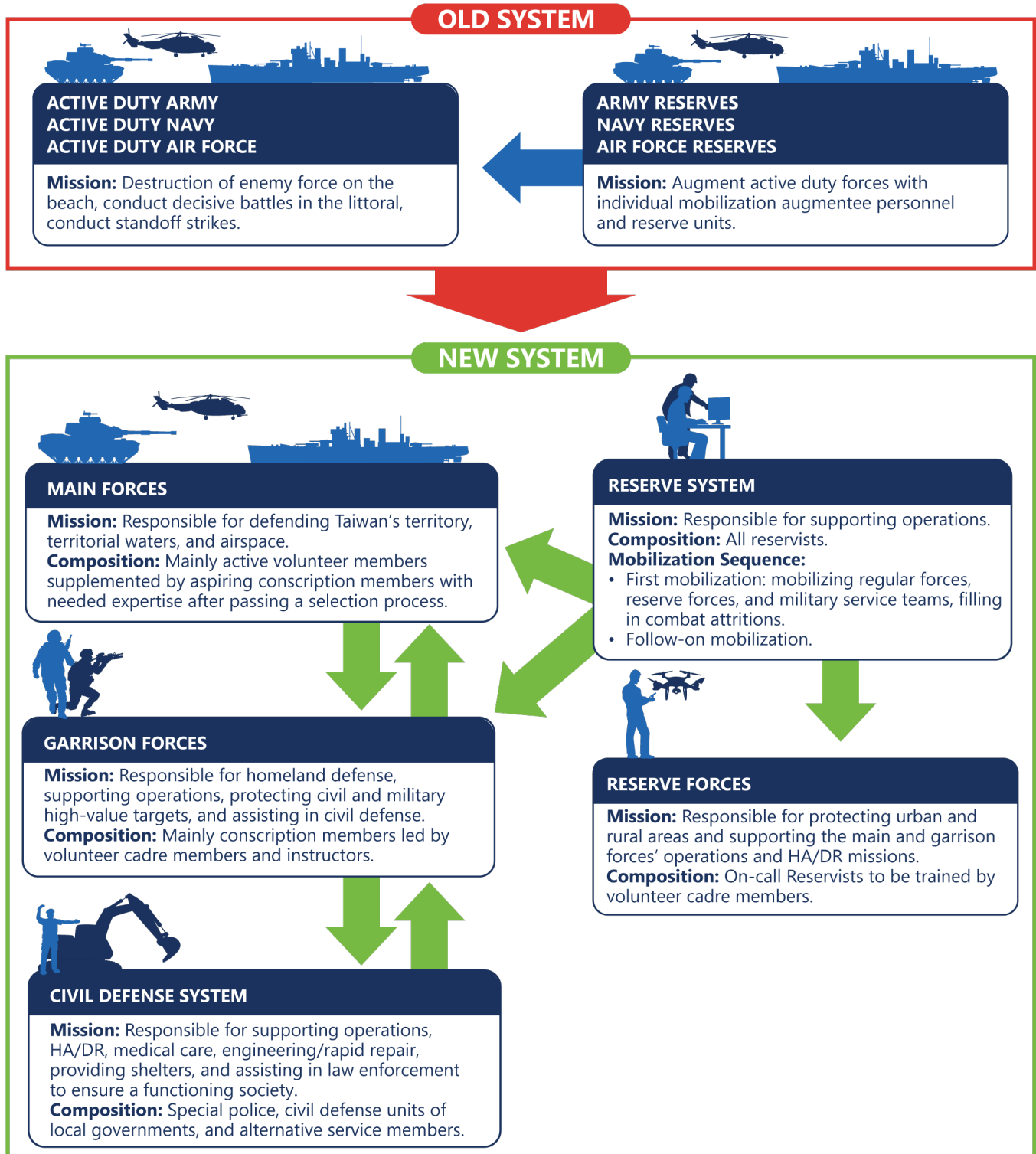
Ukraine’s Territorial Defense Force, a separate branch of the Ukrainian armed forces tasked with defending cities, guarding checkpoints, and ensuring the proper functioning of government,¹² appears to have become a model for restructuring Taiwan’s military. Taiwan analysts writing in *National Defense Magazine* noted how the Ukrainians defended their country during the initial invasion and the role that the Territorial Defense Force played in that defense.¹³

Figure 1. Taiwan military force levels

SERVICE BRANCH	ACTIVE	RESERVE
 ARMY	94,000	1,500,000
 NAVY	40,000	67,000
 AIR FORCE	35,000	90,000
TOTAL	169,000	1,657,000

Source: The International Institute for Strategic Studies, *The Military Balance 2024*, (London: Taylor & Francis, 2024), pp. 315–317.

Figure 2. Taiwan military's force structure based on all-out defense



Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense* [強化全民國防兵力結構調整方案], Republic of China Legislative Yuan, Jan. 2023, p. 6, <https://www.ustaiwandefense.com/tdnswp/wp-content/uploads/2023/01/2023.01.10-Force-Structure-Adjustment-of-All-out-Defense.pdf>.

Taiwan's New Warfighting Structure

Main forces: Composed of volunteers enlisted under a four-year term of service. Main forces are the primary maneuver units tasked with defending Taiwan from a PRC invasion.

Garrison forces: Mainly made up of conscripts who serve for one-year enlistments. The mission of the garrison force is to defend a designated area of operation. Garrison forces will defend important military and government installations, collect intelligence on the PLA, and set up checkpoints, roadblocks, and defensive positions at chokepoints. Garrison forces will also provide maintenance services to main force units.

Reserve forces: Mainly made up of volunteers and conscripts who have completed their initial tour of duty. In the event of a call up, former active duty personnel will augment active duty units, whereas former conscripts will augment garrison force units.

Civil defense forces: Made up of local paramilitary personnel who coordinate efforts between central and local governments and the private sector. Civil defense forces serve both a peacetime and wartime role and provide support to the military, such as providing medical assistance, rapid repair, and shelter and maintaining the rule of law.

Sources: Republic of China Ministry of National Defense, *ROC National Defense Report 2023*, pp. 95–96; Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 16.

Although rear-area Territorial Defense Force units conducted policing functions and general security missions, other units engaged in the full range of warfare. Territorial Defense Force units complemented regular army units in the defense of key cities, defended key railway stations, engaged in intelligence collection, and defended against Russian sabotage attempts and attacks against Ukrainian supply lines, forcing Russia to divert resources to counter their activities. According to the Royal United Services Institute, “the deployment of the Territorial Defense Force in the first month of all-out war made it possible to implement mass national resistance and inflict maximum losses of men/equipment on the enemy from the very beginning.”¹⁴

2.1 A role for guerilla forces?

Official Taiwan military and government documents make no mention of the role of popular resistance in Taiwan's defense. Some Taiwanese researchers,

however, do envision a role for guerilla warfare tactics. This is not necessarily a new proposal but appears to have captured renewed interest with the Russia-Ukraine war. In 2006, former Vice Minister of Defense Lin Zhongbin proposed carrying out “concrete jungle guerrilla warfare” that advocated taking advantage of dense urban terrain to conduct guerilla warfare.¹⁵ According to some researchers, guerilla forces could operate in advantageous terrain, such as urban areas, mountains, and areas divided by rivers that make it difficult to transfer troops and supplies, and in coastal towns near secondary beaches less suited for amphibious landings.¹⁶ Before a PRC invasion, guerilla forces would be tasked with operating in local areas to collect intelligence, maintain order, hunt down enemy agents, and encourage the local population to resist the invasion.

During the invasion, guerilla forces would collect intelligence on advancing PLA forces and conduct direct action missions, such as targeted killings,

ambushes, and raids, focusing not only on combat forces but also on the PLA's logistical tail.¹⁷ Urban areas are singled out by Taiwan researchers as ideal areas in which to conduct guerilla warfare. According to Taiwan analysts, large buildings, dense urban terrain, and sewer systems make ideal places to build defensive positions that can offset the PLA's numerical advantage. In this respect, guerrilla forces trained and equipped by reserve troops could use light weapons, antitank weapons, portable shoulder-fired anti-aircraft missiles, and uncrewed systems to attrit the PLA.¹⁸

In the event that Taiwan's main force defenses should collapse, the guerilla force would operate independently. Capitalizing on advantageous terrain, guerilla forces would conduct small-scale attacks and sabotage and conduct psychological operations to maintain support for the resistance. The intent would be to not only wear down PLA forces but to also create a space for international support, including recognition for Taiwan.¹⁹ In the event of a total collapse of Taiwan's defenses, one analyst posits that the guerilla force would likely not have continued access to weapons. In this case, the force would revert to nonviolent means to resist the PRC, such as protests, strikes, and student movements.²⁰

Guerilla forces do not have to be land based. One article proposes that small groups of guerillas employing speed boats, jet skis, and uncrewed systems can interdict PLA naval forces attacking the island or transferring personnel and supplies to the invasion force. Guerilla forces could also attack ports that have been occupied by the PLA or help defend the port in coordination with active duty units.²¹

According to Taiwanese analysts, a critical factor in developing an effective guerilla force is strengthening

the will of the Taiwanese people to resist an invasion.²² According to this thinking, a war over Taiwan will be a whole-of-nation struggle that depends on the ability and will of Taiwan's population to support military operations.²³ Taiwanese analysts argue that the government needs to go further in its efforts to instill a will to fight in Taiwan citizens. For example, one researcher states that the All-Out National Defense Education Act can be used to integrate the actions of ministries and other government offices, schools, and social groups to improve awareness of national security issues among the population.²⁴ According to that author, schools should hire "national defense education teachers" who understand international affairs, the PRC and its military, and military tactics to teach students skills useful to guerilla warfare, such as survival skills and how to fly drones and make gasoline bombs.²⁵

Another Taiwan researcher suggests that Taiwan should conduct wargames (called "survival games") to familiarize the Taiwanese people with battlefield conditions and in so doing increase their patriotism, physical fitness, and combat skills. Taiwan can also invite former foreign military personnel with combat experience to teach regular citizens basic combat tactics.²⁶ Pursuant to this, one analyst recommends that the government should encourage citizens during wartime to use cell phones to record images and video of combat that can then be posted to social media platforms with the intent to boost morale.²⁷ Finally, the author recommends that the government should partner with film studios to make patriotic films that enhance the image of military personnel. A similar approach could also be used for video games that invite players to counter PRC psychological warfare activities and to better understand the threat.²⁸

3. ALL-OUT DEFENSE

In order to carry out a Ukrainian-style defense of their country, **Taiwan government and military leaders realized that reforms needed to go beyond restructuring the missions of the army to creating a credible system of all-out defense.** Taiwan's government and military leaders have acknowledged that Taiwan's system of conscription and training was unlikely to result in an effective defense of Taiwan. Although Taiwan's military maintains a core of active duty personnel who are considered better equipped and trained, the training and equipping of conscripts and reservists was judged to be inadequate. Each of these main personnel reforms will be discussed in the following sections.

3.1 Conscription reform

Perhaps the most controversial reform made to Taiwan's conscription system, in 2022, Taiwan's Legislative Yuan (LY) passed the "Adjustment Program for Strengthening All-Out National Defense Force Structure," which extended the military service time for conscription from four months to one year.²⁹ This change was a significant reversal of previous policy.

Beginning in 2000, because of widespread opposition to conscription, the Taiwan government reduced the service requirement for conscripts from two years to one. In 2017, the government further reduced the length of service to four months from one year.³⁰ Taiwan, however, could not completely abandon conscription because of its inability to recruit sufficient numbers of volunteers into the force. Indeed, the Taiwan military has fallen short of recruiting the number of personnel needed to fill its 215,000 billets. For example, Taiwan's military recruited just 162,039 volunteers in 2019, 164,063 volunteers in 2020, 164,884 volunteers in 2021, and 159,392 volunteers in 2022.³¹

The practice of reducing service times for conscripts placed as little burden as possible on those drafted and also assumed that ample early warning would occur, which would allow time for reservists to be called up and trained. The relative swiftness of the Russian invasion of Ukraine, however, caused Taiwan authorities to reconsider this assumption. Taiwan authorities determined that the four-month conscription system would not provide enough troops in the time needed and that these troops would be inadequately trained.³² Moreover, conscripts were not assigned to actual units and bases, were not given opportunities to train on newer weapon systems, and did not have the opportunity to participate in large-scale joint exercises such as the *Han Kuang* exercise.³³ The one-year service obligation, however, provides an opportunity to increase training time and improve the quality of training.

3.1.1 Recruit training

The "Adjustment Program for Strengthening All-Out National Defense Force Structure" also targeted recruit training. Taiwan analysts identify the lack of training among Russian recruits as a factor in Russia's high casualty rates. One researcher notes that Russia does not have designated training centers or training units for newly mobilized conscripts, and specially designated units to train new recruits have been deployed to the front lines.³⁴

Training quality and capacity are also issues for Taiwan's military.³⁵ Basic training has been extended to eight weeks (from five weeks), and more practical training has been added.³⁶ New training includes battlefield environment simulations to improve the stress tolerance of soldiers, modern combat training, and field first aid training. In addition, the number of live rounds fired during recruit training will increase from 86 to 160 rounds per soldier (see Figure 3, Figure 4, and Figure 5).³⁷

Figure 3. Previous five-week basic training regimen

TERM AND PHASE	TRAINING ITEMS
<p>WEEK 1 Adapting Training</p>	<ul style="list-style-type: none"> • Set individual data, distribute equipment, physical examination • Core military values, gender relations, sexual harassment prevention • Basic military law, mental fitness, personal appearance training, basic physical briefing • Individual uniform and equipment maintenance briefing
<p>WEEK 2 Basic Training</p>	<ul style="list-style-type: none"> • Basic physical training • Tactical training • Casualty evacuation training • Nuclear, biological, and chemical (NBC) weapons training • Preliminary firearms training • Terrain identification training • Objectives identification and reporting
<p>WEEK 3 Individual Training</p>	<ul style="list-style-type: none"> • Basic and qualification marksmanship • Composite combat drills • Tactical training (500-meter obstacle course, physical fitness test)
<p>WEEK 4 Composite Training</p>	<ul style="list-style-type: none"> • Movement to contact • Obstacle elimination and bypass • Team combat drill
<p>WEEK 5 Final Test Distribution</p>	<ul style="list-style-type: none"> • Composite combat drills with 3-day tactical march, bivouac, and scenario training.

Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 30.

Figure 4. Previous four-month training regimen

TERM AND PHASE	TRAINING ITEMS
<p>WEEK 1 MOS Training</p>	<ul style="list-style-type: none"> • Personal work and rights • Secrecy protection • Medical care • Firearms management • Psychological counseling education • Military discipline security • Garrison education
<p>WEEK 2–WEEK 5 Specialty Training</p>	<ul style="list-style-type: none"> • Basic physical fitness • Branch technical skills (close-quarters combat, combat physical fitness, obstacle course, grenade throwing) • Marksmanship (increase from 54 rounds to 84 rounds/person) • Urban warfare • Combat drills
<p>WEEK 6–WEEK 7 Civil Defense and Disaster Relief Training</p>	<ul style="list-style-type: none"> • Civil defense training • Disaster relief
<p>WEEK 7–WEEK 11 Specialty Training</p>	<ul style="list-style-type: none"> • Basic physical fitness • Branch technical skill • Marksmanship (Increase from 54 rounds to 84 rounds & from 15 rounds to 45 rounds for nighttime/person) • Urban warfare • Platoon situational training exercise

Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 31.

Figure 5. New eight-week training course

TYPES	8 WEEKS	
	5 WEEKS	ADD 3 WEEKS
General Course	Equipment maintenance, basic drill, medical education, military discipline education, law education	Combat stress training under simulated battlefield conditions, psychological health <i>(16 hours added)</i>
Tactical Skills	Basic physical training, grenade throwing, 500-meter obstacle course, and close quarters combat	Health management, sport science, physical strength, and stamina training <i>(10 hours added)</i>
Weapon Drill	Weapons instruction and rifle range shooting with 104 rounds in prone position	Firearms shooting in all positions and an increase in rounds fired to 160 <i>(72 hours added)</i>
Combat Drill	Combat drills, NBC weapons defense training, and combat stress tolerance training	Combat medicine and survival training, tactical maneuvers, and bivouac training <i>(52 hours added)</i>

Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 13.

3.1.2 Post-recruit training

Additional professional training tailored to the mission of the garrison force is now conducted after basic training.³⁸ Training will include instruction on new weapon systems, territorial defense missions, defending important military and civilian facilities, and coordination with wartime civilian elements for missions such as disaster relief (see Figure 5).³⁹

3.1.2.1 New weapon systems training

Depending on their occupational specialty, soldiers will undergo training on new weapon systems such as the Kestrel antiarmor rocket, Stinger anti-air missile, Javelin antitank missile, and drones. New types of training methods, such as training simulators and laser engagement systems, will also be used.⁴⁰

3.1.2.2 Territorial defense missions

Territorial defense mission training includes practicing how to build blockades and create chokepoints and training on urban warfare tactics.⁴¹

3.1.2.3 Defending important military and civilian facilities

Training on defending important military and civilian facilities involves troops becoming familiar with military police units and other security forces to provide security for important military and civilian facilities. The goal is to ensure the function of people's livelihood and local government to maintain Taiwan's social resilience.⁴²

3.1.2.4 Coordination training

Coordination training with civil defense organizations will allow troops to become familiar with supporting civil defense efforts. Troops will participate in supporting disaster relief operations, such as disaster victim resettlement and air-raid evacuation, as well as providing medical support to wounded civilians.⁴³

3.1.3 Pay and benefits

To incentivize participation in the military, the Taiwan military is increasing the salaries of conscripts and reservists. Under the previous system, a four-month conscript would earn NT \$6,500 per month (~US \$204). One-year conscripts can now earn NT \$20,320 per month (~US \$638) as privates (see Figure 7). In addition, conscripts will also receive military insurance, health insurance, and food allowances for an additional NT \$5,987 (~US \$188).⁴⁴ The conscripts' time in service will be counted toward their civilian pension.⁴⁵

For reservists, the military has also raised the pay for its 14-day annual training by 50 percent. Reservists can get free medical care at a military hospital for one year after their last 14-day annual training and can receive discounts at military hostels, commissaries, and post exchanges.⁴⁶ The military will also incentivize

participation in 14-day annual training. Reservists can voluntarily join the 14-day annual training, and a NT \$5,000 (~US \$156) bonus will be awarded to those who have attended five annual trainings (see Figure 6 and Figure 7).⁴⁷

3.2 Problems to resolve

3.2.1 Potential problems regarding reserve force mobilization

A central component of organizing a defense in depth is the mobilization of the required number of personnel in the required amount of time. According to one Institute for National Defense Security Research (INDSR) article, draft dodging has been a major problem for both Ukraine and Russia, enabled by corruption.⁴⁸ According to the INDSR article, the issue is so severe that President Volodymyr Zelenskyy relieved all regional conscription managers and replaced them with newly retired veterans and wounded military personnel.⁴⁹

Taiwanese experts deem that similar issues could occur in the mobilization of Taiwan's reserve force.⁵⁰ Taiwanese researchers assess that compared to Russia and Ukraine, Taiwan will likely encounter greater challenges when trying to conduct wartime mobilization because of it being wealthier and more democratic, which makes it less likely for the Taiwanese people to accept the pay and regimentation of military life.⁵¹ According to one Taiwanese analyst, Taiwan should follow the example of Ukraine's Territorial Defense Force, which offered financial incentives for reservist participation in peacetime training.⁵²

Taiwanese researchers also recommend that Taiwan's armed forces should train on the mobilization process itself. The All-Out Defense Mobilization Agency, the organization assigned to carry out this task, should include the wartime

Figure 6. Four-month versus one-year conscription post-basic training

TYPES	4-MONTH CONSCRIPTION <i>8 WEEKS</i>	1 YEAR CONSCRIPTION <i>44 WEEKS</i>
Specialty Training <i>18 WEEKS</i>	Specialty training, civil defense training, marksmanship <i>(8 weeks)</i>	Conduct individual military occupational specialty (MOS) training at the garrison, organic weapons marksmanship, advanced weapons operation, physical fitness, civil defense, and disaster relief training.
Collective Training <i>7 WEEKS</i>	X	Conduct individual MOS training at the garrison, organic weapons marksmanship, advanced weapon operation, physical fitness, civil defense, and disaster relief training.
Rotation Training <i>13 WEEKS</i>	X	Conduct tactical march, camp training, company/ battalion composite combat drills, live fire training.
Joint Exercise <i>6 WEEKS</i>	X	Conduct defensive operations planning exercises in assigned area of operation and take part in Han Kuang and Ming-An exercises.

Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 33.

Figure 7. Private first-class pay for volunteers and four-month and one-year conscripts

ITEM	VOLUNTEER	4-MONTH CONSCRIPT	1-YEAR CONSCRIPT
Pay	10,130 NTD (~US \$315)	6,510 NTD (~US \$203)	10,130 NTD (~US \$315)
Specialty Pay	15,190 NTD (~US \$473)	—	10,190 NTD (~US \$317)
Volunteer Pay	10,000 NTD (~US \$311)	—	—
Total	35,320 NTD (~US \$1,099)	6,510 NTD (~US \$203)	20,320 NTD (~US \$632)

Source: Taiwan Ministry of National Defense, *Force Structure Adjustment of All-Out Defense*, p. 22.

Note: Government will cover conscript’s allowance for military insurance (1,240 new Taiwanese dollars (NTD)), health insurance (1,839 NTD), and food (2,908 NTD) for a total of 5,987 NTD.

mobilization assembly process in annual reservist combat and skills training. Doing so would ensure that personnel are familiar with the mobilization process and would provide opportunities to troubleshoot potential problems in the mobilization process. This suggestion would serve to simulate and evaluate each segment of the reservist mobilization process that includes law enforcement issuing mobilization orders for reservists to report to designated locations with necessary identification documents.⁵³

3.2.2 Reserve force logistics issues

Taiwanese experts also note that logistics support for reservists is inadequate. According to an INDSR article, newly mobilized Russian conscripts often receive poor quality gear and weapons, including

rusty rifles and magazines.⁵⁴ Logistic issues are not limited to Russia, however. Ukraine’s newly mobilized conscripts also encountered similar issues during the initial stage of the conflict. For example, the Ukrainian military lacked sufficient barracks and gear for newly mobilized conscripts.⁵⁵

The INDSR article points out that improving logistics is also a key factor in improving the combat effectiveness of Taiwan’s reserve force. Taiwanese researchers point out that the reserve force needs more training facilities geared toward the defense of cities and towns.⁵⁶ Taiwan’s reserve force also needs better equipment and gear, including basic military equipment such as individual combat gear and first aid kits, as well as munition stockpiles. Currently, the reserve forces primarily use equipment phased out from the active duty units.⁵⁷

3.3 Civilian efforts

Civil society efforts are a second line of effort to prepare Taiwan for a potential conflict with the PRC. Monitoring the Russia-Ukraine war has led to increased awareness of problems in Taiwan's civil defense and generated interest among private citizens.

3.3.1 Civil defense system

Taiwan's civil defense system falls under the National Civil Defense Command Center and governs the government's response to natural disasters and war.⁵⁸ Civil defense has received increased attention by Taiwan authorities because of the Russia-Ukraine war. However, deficiencies in Taiwan's civil defense system remain.

According to a report by the pro-independence Taiwan Statebuilding Party, civil defense measures have long been ignored in Taiwan because of a lack of concern over a potential PRC invasion. According to the report, civil defense units "lack concrete missions" and government documents such as the Civil Defense Act, and the Ministry of the Interior's Civil Defense Mobilization Guidelines offer little guidance on their operation other than "they are to support the military in wartime and help people cope with disasters in peacetime."⁵⁹

The number of Taiwan's civil defense personnel are reported to be as high as 400,000, with 50,000 people reported to be members of the National Police Agency's civilian defense agency. However, hiring of civil defense staff has reportedly lacked standardized procedures. According to experts cited in a Taiwan press article, hiring is often based on recommendations, "without proper evaluations and evaluation mechanisms."⁶⁰ Most staff are men between the ages of 50 and 70 who receive just four hours of training per year, described by one Taiwan government official as resembling a "karaoke party."⁶¹

Moreover, few of the funds allocated to civil defense efforts support training, according to the Taiwan Statebuilding Party report. Instead, much of the money has been allocated for year-end banquets and special gatherings. Taichung, Kaohsiung, and Yilan counties, for example, only used 2 percent, 10 percent, and 13 percent, respectively, of their civil defense budgets for training. In Taipei, only 4 percent of the funding was used on training, and the remaining funds were spent on "friendship," awards, and other expenses.⁶²

One effort that has received prominent attention in the promotion of civil defense is the publication of a civil defense handbook in April 2022. The *All-Out National Defense Manual*, published by the Taiwan MND (not a civil defense office) provides Taiwan citizens with wartime and disaster emergency response information. The handbook was reported to have been planned before the 2022 invasion of Ukraine and was revised in June 2023.⁶³ The handbook provides practical advice for a number of contingencies, including natural disasters, air raids, identifying mis-, dis- and mal-information, and possible wartime scenarios, and offers guidance on how to distinguish between Taiwan military troops and PLA troops.⁶⁴ According to one analyst, however, the handbook is good, but deficient when compared to the Ukrainian handbook. Unlike Taiwan's handbook, the Ukrainian handbook provides detailed information on ways to actively resist the Russian invasion and occupation, including describing in detail how to conduct various acts of sabotage.⁶⁵

3.3.2 Private efforts

To fill the vacuum of civil defense efforts, a number of private organizations have begun offering courses in civil defense, backed up by a NT \$3 billion (~US \$95 million) donation by the former chairman of

United Microelectronics Corporation to support civil defense efforts.⁶⁶ One prominent organization, the Kuma Academy, has the goal of training 3 million people in civil defense efforts.⁶⁷ The Kuma Academy holds 20 to 25 classes a month with 40 to 50 students attending each class. The training offered spans multiple topics, including familiarization with China, intelligence collection, first aid, information security, fifth column activities, self-defense, home defense, map reading, and physical fitness.⁶⁸

Ordinary Taiwanese citizens are also taking the initiative to prepare for a potential PRC invasion. Attendance at shooting ranges where customers can fire airsoft guns that fire small plastic projectiles instead of real bullets has increased after the Russian invasion of Ukraine. There, customers can learn how to shoot and handle firearms safely, and reservists can refamiliarize themselves with the real firearms they would use if they were called up.⁶⁹

4. UNCREWED SYSTEMS

Uncrewed systems are a major focus for Taiwan's military after the Russian invasion of Ukraine.

According to a *Japan Times* article, a Taiwan military report warned that Taiwan is critically behind the PRC in both numbers of uncrewed systems and their capabilities. In response, President Tsai Ying-wen prioritized the acquisition of uncrewed systems for the Taiwan military.⁷⁰

Since then, Taiwan has embarked on an ambitious program under its National Drone Team that brings together government, military, and industry research organizations to manufacture uncrewed systems domestically. The Taiwan military has committed to acquiring more than 700 military-grade UAVs and more than 7,000 commercial-grade UAVs by 2028.⁷¹ Taiwan also plans to acquire counter-drone systems to defend against a PLA force equipped with more capable and numerous uncrewed systems.

4.1 Taiwan assessments of uncrewed systems

Taiwan analysts noted the utility of drones in the Russia-Ukraine war, the Nagorno-Karabakh conflict in 2020, the Israel-Hamas war, and the Iranian attacks against Saudi oil fields in 2019.⁷² According to one analysis, drone attacks have produced "impressive results" at low costs.⁷³ Taiwan analysts discuss several missions that uncrewed systems can perform, including intelligence, surveillance, and reconnaissance (ISR), communications, and strike missions.⁷⁴

Taiwan analysts note that uncrewed systems fit nicely into the Taiwan military's emphasis on asymmetric operations. Uncrewed systems can be low cost, attritable (disposable), and easy to operate

and can mitigate Taiwan's recruitment challenges by replacing human personnel.⁷⁵ The use of uncrewed systems can also increase wartime costs for the PRC by prolonging operations and making it difficult for the PLA to sustain operations.⁷⁶ According to one analyst:

The development of uncrewed aerial vehicles (UAVs) is imperative for Taiwan. Under the new operational guidance of the National Army of "multi-dimensional defense, layered obstruction, sustained defense, and key breakthroughs," UAVs are very important for defense operations. It is important not only to effectively building asymmetric combat power, but also to bring lasting combat power, and is expected to achieve the goal of effectively deterring enemy aggression.⁷⁷

Another Taiwan analyst notes that UAVs and uncrewed ground vehicles (UGVs) could complicate PLA operations in Taiwan's heavily urbanized terrain.⁷⁸ Taiwan researchers also assess that drone technology can make the PLA's force more resilient to PRC attack. They anticipate that PRC military action will start with a combined air and missile attack, including attacks by uncrewed systems, intended to disrupt Taiwan's C2 network and critical military facilities.⁷⁹ Taiwan researchers argue that drones, in particular UAVs, can be an important component of a resilient command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) network that can provide communications and collect intelligence when other capabilities have been suppressed.⁸⁰ According to one researcher, UAVs can be used to compensate for deficiencies in naval radar, which often inaccurately locates the position of long-range surface targets.⁸¹ Moreover,

the numerical superiority of the PLA over the Taiwan military will likely mean that Taiwan's air force and navy will suffer critical losses that will be difficult to replace without the use of uncrewed systems. Long-range UAVs and uncrewed surface vessels (USVs) could fill the role of aircraft and surface vessels in attacking PLA aviation and naval platforms.⁸²

Taiwan researchers also anticipate that PRC attacks will be carried out against Taiwan airbases with the intent of destroying aircraft on the ground and suppressing flights into and out of airbases by targeting runways, air traffic control centers, fuel and ammunition depots, anti-aircraft positions, and C4ISR nodes. To mitigate the damage inflicted by PRC attacks, one Taiwan researcher recommends that Taiwan's military should operate UAVs from expedient runways, such as roads.⁸³ These short and minimally prepared runways would not only serve to insulate Taiwan from attack by dispersing Taiwan's UAVs across the island but could also provide alternative airfields to avoid interference with crewed aircraft missions.

Researchers publishing in a Taiwan air force journal note that these UAV sites should be located in southern Taiwan, at least for large platform UAVs requiring runways, pointing out that Taiwan's east coast is mountainous and the plains in the center and western portions of the island are too densely populated.⁸⁴ This set of researchers notes that the purchase of four MQ-9 Reaper UAVs from the United States and the Tengyun UAV, currently under development by Taiwan, would be suited for these types of operations because they can operate from 1,000-meter long runways.⁸⁵

To further increase their utility, researchers recommend that Taiwan military drones should become modularized (i.e., able to integrate components that can be reconfigured for a variety of missions). These authors argue that modularization can enhance asymmetric operations by facilitating

transport, use, maintenance, and repair. Modularized UAVs can also be disassembled for transportation on narrow roads and through tunnels. Individual parts from modularized engines can be sent for repair instead of the whole engine.⁸⁶

4.2 National Drone Team

Taiwan analysts assess, however, that Taiwan lags behind other countries in drone technologies.⁸⁷ In fact, most articles on Taiwan's development of UAVs conclude that the Taiwan military is far behind the PLA and that the PLA's emphasis on uncrewed systems can place Taiwan at a disadvantage.⁸⁸

As a result, Taiwan military investments in uncrewed systems have been fast tracked under a program called the "National Drone Team" that is enlisting the capabilities of Taiwan's private sector to develop drones. In March 2022, Taiwan's Ministry of Transportation and Communications established UAS-Taiwan (台湾无人机大联盟), an alliance made up of industry, government, academic, and research organizations to promote and expand the development of Taiwan's drone industry.⁸⁹ Nine companies have reportedly been enlisted.⁹⁰

Taiwan has also established the Uncrewed System AI Innovation Application R&D Center (亚洲无人机AI创新应用研发中心).⁹¹ The R&D Center, located in Chiayi County in southwestern Taiwan, was selected because of its diverse geography of coastlines, mountains, and plains.

Taiwan analysts note that Taiwan has the industrial capacity to manufacture drones.⁹² Taiwan is a leader in battery production and is capable of producing optics that could be used in sensor technologies and controls used to operate uncrewed systems. Taiwan is also an international leader in software development. But Taiwan also faces numerous challenges in creating a sustainable drone industry. Its domestic market is not big enough to support the industry,

and it faces stiff competition internationally from PRC drone manufacturers such as DJI, which can offer low-cost drones at prices that Taiwan manufacturers cannot beat. Although Taiwan industry has the potential to manufacture drones, most Taiwan drone manufacturers source their components from the PRC.⁹³ For example, most Taiwan-manufactured UAV motors are suitable for hobbyists but cannot meet high-end needs.⁹⁴

One member of the National Drone Team is Thunder Tiger Group. Thunder Tiger Group unveiled a prototype of the Seawolf 400 autonomous underwater vehicle in 2023. The vessel is 4 meters long, weighs 1,000 kilograms, and can operate at depths down to 200 meters. The company is also developing the Sea Shark 400, a 3.84-meter-long autonomous USV that can operate at speeds up to 80 kilometers per hour.⁹⁵ According to media reports, Taiwan's National Chung-Shan Institute of Science and Technology has initiated the development of two USV prototypes after Ukraine demonstrated the utility of USVs in attacking Russian ships. According to reports, an attack variant of this USV can operate as far as 43 miles from its operator and can coordinate with air, land, and underwater uncrewed vehicles.⁹⁶

The National Drone Team plan also calls for developing a "kill chain" for drones and building more than 3,200 drones between mid-2024 to 2028, ranging from small mini-drones weighing less than 2 kilograms to larger UAVs that can fly up to 150 kilometers at a cost of NT \$5.68 billion.⁹⁷ The drones will be drawn from five categories: micro-UAVs, target acquisition UAVs, surveillance UAVs, uncrewed surface surveillance vessels, and uncrewed ground surveillance vessels. According to the Taiwan government, NT \$1,396,913 million (~US \$44 million) have been budgeted for drones. The army will purchase 320 micro-UAVs, and the air force will purchase 315 UAVs. The All-Out Defense Mobilization Department will acquire 850 aircraft, accounting for 57.23 percent of the total military requirements.⁹⁸

Prototypes for these drones were to be delivered by the end of July 2023. According to the Taiwan government, prototypes for the microdrones and target acquisition drones were accepted. However, the prototypes for the surveillance drones, ship-based surveillance drones, and ground surveillance drones were returned for improvements.⁹⁹

4.3 Counter-drone warfare

Taiwan researchers have also identified counter-drone warfare as a key area of focus for the Taiwan military. According to one researcher, PLA UAVs are an integral part of China's attack force that should be considered a threat equal to crewed aircraft and tactical ballistic missiles. Taiwan researchers write that drones present several challenges to defenders. Drones have the capability to fly autonomously and are difficult to detect because of their small size, slow speeds, and low-altitude flight.¹⁰⁰ One researcher notes, for example, that only the Keelung-class destroyers (the former Kidd-class destroyers) have phased array radars that can best detect drones.¹⁰¹ Uncrewed systems can also operate in coordinated swarms to conduct reconnaissance and strike missions.¹⁰²

Taiwan's lack of counter-UAV capabilities was demonstrated in 2022 when Taiwan soldiers based on the island of Kinmen/Jinmen could not effectively deal with drones flying over the island. Since that time, the Taiwan military has shot down drones conducting similar flyovers.¹⁰³ According to one analysis, Taiwan's MND has released a counter-UAV plan using uncrewed defense systems, ground-based short-range anti-aircraft missiles, and anti-aircraft artillery. Taiwan analysts note, however, that counter-drone warfare is characterized by cost asymmetries. Counter-drone technologies can be much more costly than the drones they are intended to defeat. As a result, Taiwan researchers recommend nonkinetic means to defeat drones, such as lasers and electronic jammers.¹⁰⁴

5. SATELLITE COMMUNICATIONS

The use of satellite communications has been identified as a critical element for Taiwan to maintain wartime communications. During the Russia-Ukraine war, Starlink has been used extensively by the Ukrainian military, and its communication functions and resiliency to attack have been important features that are fundamental to how Ukraine has achieved battlefield success. Starlink has been called the “essential backbone of communication on the battlefield” for Ukrainian forces.¹⁰⁵

Taiwan’s government argues that the island’s geography makes it essential that multiple sources for maintaining communications are available on the island of Taiwan, and also with Taiwan’s outer islands and the international community. Fourteen submarine internet cables link Taiwan to the rest of the world; however, these cables are vulnerable to being cut by the PRC. In fact, submarine cables to Taiwan have been cut 30 times between 2017 and 2023, many times most likely unintentionally.¹⁰⁶ In February 2023, Matsu, one of Taiwan’s outer islands, had two submarine cables cut by PRC ships conducting sand-dredging operations.¹⁰⁷ The incident slowed internet traffic to a crawl and caused text messaging to take up to 15 minutes. It is unknown if the actions of the PRC ships were intentional, however.¹⁰⁸

The vulnerability of Taiwan’s communications has renewed interest in the use of satellite communications to supplement government and military C2 systems. In August 2022, the Taiwan Ministry of Digital Affairs issued the “Program for the Digital Resilience Validation of Emerging Technologies for Contingency or Wartime Applications” that called for Taiwan to diversify its communication infrastructure with communication satellites.¹⁰⁹ Citing the 2022 eruption of a Tongan volcano and the Russian invasion of Ukraine, the

plan calls for the government to set up 700 receiver stations around the main island of Taiwan and 70 receiver stations on the outlying islands in fire and police stations, schools, and hospitals.¹¹⁰ According to the program, as many as 6,882 receiver stations could be set up around the country.¹¹¹

Starlink would appear to be an obvious candidate for Taiwan’s plans, given its role in maintaining Ukrainian communications. In fact, Taiwan’s interest in Starlink reportedly dates to 2019 when the Taiwan government began discussions with SpaceX for the supply of satellite communication services. According to press reporting, negotiations broke down in 2022 over Taiwan government requirements that telecommunications providers have at least 51 percent local ownership.¹¹² Elon Musk’s business interests in China may have also caused both sides to reconsider the deal. Electric vehicle manufacturer Tesla, whose top shareholder is Musk, has a factory in China, and China has asked Musk not to allow Starlink to operate in China. Musk has also voiced sentiment that appears to support the PRC’s position on Taiwan.¹¹³ Taiwan government officials, in contrast, have also expressed reluctance to work with Starlink because of Musk’s business interests in China potentially exposing him to PRC influence.¹¹⁴

As a result, Taiwan has looked to other satellite communication providers. In August 2023, the Ministry of Digital Affairs announced that it would partner with the Luxembourg company SES for satellite services and ground infrastructure.¹¹⁵ In November 2023, Chunghwa Telecom, the largest integrated telecommunications service provider in Taiwan, signed an exclusive multimillion-dollar distribution partner agreement for low earth orbit (LEO) satellite services with Eutelsat OneWeb, a European company based in London.¹¹⁶

Ultimately, Taiwan intends to launch its own communications satellite constellation. In 2023, the Taiwan Space Agency stated that it intended to establish a company to build a constellation of communication satellites made up of as many as 120 to 150 satellites to maintain constant communications over Taiwan.¹¹⁷ This project could take years to complete, however, necessitating a need to seek foreign service providers in the interim.¹¹⁸

6. COGNITIVE WARFARE

In 2022, Taiwanese president Tsai Ing-wen called PRC cognitive warfare and information warfare operations the biggest challenges to Taiwan's survival.¹¹⁹ President Tsai further stated, “We cannot become complacent. We must be vigilant. We must continuously strengthen our capability to fight against cognitive warfare.”¹²⁰ Considering the threat from the PRC and the Russian use of cognitive warfare against Ukraine, Taiwanese researchers have focused on the measures that Taiwan can take to defend against PRC cognitive warfare operations.¹²¹

6.1 Assessments of cognitive warfare operations in Russia-Ukraine war

Taiwan researchers note that social media has become a major channel for spreading disinformation and that in the early stage of the Russia-Ukraine war, Russia used social media platforms to spread false information.¹²² In the early stage of the Russia-Ukraine war, deepfake artificial intelligence technology was used to generate fake videos of Ukrainian president Volodymyr Zelenskyy telling Ukrainians to surrender.¹²³

Taiwanese discussions focus on how to defend Taiwan against PRC cognitive warfare operations. One important lesson Taiwanese researchers draw from the Russia-Ukraine war is the use of a “whole-of-society approach” to defend against cognitive warfare operations. According to Taiwan analysts, a whole-of-society approach is a strategy that consolidates government, private sector, and social media efforts to counter enemy cognitive operations.¹²⁴

One INSDR article points out, for example, that cognitive warfare played an important role in Russia's

seizure of Crimea in 2014, but in 2022, Ukraine and the West were able to counter Russian cognitive warfare by using a whole-of-society approach. According to the article, Ukraine and Western governments worked with privately owned social media platforms to take down or debunk Russian online propaganda, which has been key to countering Russian cognitive warfare.¹²⁵

The INSDR article points out, however, that although Taiwan has its own fact-check organizations such as Taiwan FactCheck Center and MyGoPen, Taiwan still needs to improve its own whole-of-society approach to better consolidate the operational capability and capacity of all sectors to counter PRC cognitive warfare operations. The article suggests conducting joint exercises and interactions between official organizations, such as the military, the private sector, and civilian social media influencers.¹²⁶

Taiwanese experts writing on the Russia-Ukraine war have also observed Ukraine's regulation of the media environment targeting media outlets affiliated with or sponsored by Russia. The article points out that since Russia's occupation of Crimea in 2014, Ukraine has shut down more than 80 pro-Russia media outlets or media outlets affiliated with the Russian government acting as channels for Russian cognitive operations.¹²⁷ Taiwanese experts have also observed that the US and other Western countries were able to work together to flag and take down disinformation from official Russian media channels. As a result, Russia's disinformation efforts are not as effective as planned.¹²⁸

Taiwanese legislators have proposed that the “All-Out Defense Mobilization Act” allows the Taiwanese government to inspect, gather information on, and coordinate the activities of media outlets in Taiwan in order to better counter PRC cognitive operations.

However, this proposal has triggered concerns over government control of the media and the exercise of free speech.¹²⁹

Another article from INDSR argues that using facts to combat disinformation is more effective than using propaganda and nationalism. The article states that Ukraine was able to counter Russian cognitive operations with facts accompanied by messaging directed toward the broader population. For example, Ukraine set up the “Look for Your Own” website and social media account to provide information on Russian prisoners of war and casualties for the families of Russian soldiers. According to Taiwan researchers, these types of activities not only exposed Russian military losses on the battlefield but also demonstrated Ukraine’s humanitarian efforts to the international community and the Russian people.¹³⁰

The INDSR analyst points out, however, that for Taiwan to develop a psychological warfare strategy based on facts, key conditions have to be satisfied. First, Taiwan would need to acquire internet equipment and platforms capable of being used reliably during wartime. Second, Taiwan must be able to survey and accurately identify the audience’s usage and access to media. Third, cooperation with the civilian sector would be necessary to gain sufficient human resources and technical support. Fourth, communicating psychological warfare messaging through facts instead of traditional propaganda methods would need to be considered to increase the credibility and truthfulness of the message.¹³¹

6.2 Taiwan views of PRC cognitive warfare

According to Taiwanese analysts, PRC scholars define *cognitive warfare* as achieving the control of an opponent’s cognition in order to influence an opponent’s mind, emotions, and behaviors. According to PLA scholars, cognitive warfare is

considered the ultimate form and highest level of military operation.¹³²

According to an INDSR article, the Chinese Communist Party (CCP) has three major goals for using cognitive warfare to assist the unification of Taiwan:¹³³

- Defaming the Taiwanese military to undermine the confidence of the Taiwan people in the military.¹³⁴
- Generating skepticism of US resolve to plant mistrust toward the US commitment to Taiwan and deepen the impression of “foreigners as unreliable.”¹³⁵
- Instigating a fear of war among the Taiwan population.¹³⁶

Moreover, cognitive warfare could help develop pro-CCP and pro-PRC groups among the Taiwanese population and potentially increase their willingness to conduct sabotage operations in support of PLA operations during wartime.¹³⁷

An INDSR article points out that the PRC’s preferred means of spreading information and promoting its unification agenda are social media, traditional media, and cyberattacks. The PRC follows a three-step process for spreading disinformation:¹³⁸

- Step 1: Build a reliable information platform to gain credibility and grow an audience.¹³⁹
- Step 2: Introduce controversial information as clickbait that is hard to fact-check but attracts attention.¹⁴⁰
- Step 3: Create issues and spread narratives that are difficult for the Taiwanese government to counter and increase mistrust of the democratic system among the Taiwanese people.¹⁴¹

In addition, Taiwan analysts write that the PRC uses viral marketing to promote themes beneficial to the PRC. For example, “Going to Taiwan in 2035,” a song

that describes building a high-speed railway between the PRC and Taiwan, became popular because of a possible promotional campaign facilitated by social media algorithms on PRC social media sites TikTok, Weibo, and Bilibili.¹⁴² Concurrently, PRC traditional media such as Xinhua and the *Global Times* also helped increase the exposure of the song.¹⁴³

Cyberattacks are also a means for PRC cognitive operations. One INDSR article points out that during Speaker of the House Nancy Pelosi's visit to Taiwan, cyberattacks were conducted in which public monitors in convenience stores and retail stores were hacked to display PRC propaganda.¹⁴⁴

7. CONCLUSION

Ukraine’s invasion by Russia offers many lessons learned for Taiwan. These lessons include how a defense in depth and a whole-of-society approach can deny territory to an enemy and wear down its forces, the importance of personnel policies that ensure mobilization capacity, the role of uncrewed systems in modern warfare, the critical role of satellite communications in maintaining network connectivity, and the need to defend against cognitive warfare operations to maintain national will. Taiwan government and military documents, recent military reforms, and ongoing research indicate that the Taiwan national security establishment has identified lessons learned from the Russia-Ukraine war and is already making changes to Taiwan’s armed forces to apply these lessons learned. The military and civilian reforms have only begun, however, and the ultimate determinant of their success will be in their implementation should a conflict occur in the Taiwan Strait.

7.1 Force structure matters

Ukraine’s Territorial Defense Force serves as a model for Taiwan military restructuring.

The change from a regular and reserve-based military structure to one composed of a main force, garrison force, reserve force, and civil defense force draws on Ukraine’s experience with its Territorial Defense Force. In the Taiwan case, better trained and equipped main force units would be employed in offensive operations against PLA forces while garrison forces would be responsible for the relatively less-sophisticated defense mission. As such, this setup implicitly acknowledges the resistance to conscription in Taiwan and the potentially lower performance of conscripted troops compared to volunteers.

Similar to the Ukraine military’s defense of Kyiv and other cities, the creation of a garrison force establishes a defense in depth that, according to Taiwan military researchers, is intended to fight the PLA in geographically advantageous positions, especially urban areas. Taiwan military analysts argue that a defense in-depth strategy is intended to improve deterrence by raising the costs of a Taiwan invasion to the PRC while simultaneously acknowledging that the losses inflicted on the PRC may not be enough to win the war.

However, the role of the Republic of China Navy and Air Force appears to be largely unchanged.

Personnel changes, such as the length of service obligations of conscripts, also pertain to the navy and air force, but the all-out defense mobilization plans appear to be primarily directed at the army. The Republic of China Navy, according to the 2023 National Defense Report, will continue to “meet its requirements for joint sea control missions,” and the Republic of China Air Force will be responsible for overall air defense operations. However, it is unclear how personnel and training changes initially focused on the army’s defense in depth will affect how the navy and air force operate, especially given the important role each service has during wartime to deny the ability of the PLA to cross the Taiwan Strait and during peacetime to contest PRC gray zone operations.

According to Taiwan MND documents, Taiwan’s navy will deploy additional shore-based mobile antiship missile batteries and refine its minelaying tactics. It will also acquire light frigates to conduct sea control operations and to counter PRC gray zone tactics.¹⁴⁵ The air force, in contrast, has been replacing obsolete missiles with new and upgraded missiles to defend against air attacks. The air force may also be tasked

with conducting strikes against PRC centers of gravity and critical nodes.¹⁴⁶ In addition, the army will also play a role in opposing a PLA attempt to cross the Taiwan Strait by acquiring long-range precision strike systems and deploying an additional multiple launch rocket system to conduct long-range strikes against the PLA and high-value targets.¹⁴⁷

7.2 Personnel are critical for all-out defense

Taiwan has recognized that well-trained personnel are key to any defense.

The Russia-Ukraine war demonstrates the importance of having sufficient numbers of well-trained personnel. After letting its military atrophy between 1991 and 2014, Ukraine rebuilt its military through recruitment, conscription, and training.¹⁴⁸ Taiwan is following a similar path by making the politically unpopular decision to lengthen service commitments for conscripts. This move is intended to not only increase the number of personnel available for Taiwan's defense but also make them better trained.

Yet, Taiwan has not adopted a popular resistance similar to that used in Ukraine.

The popular resistance model, one important feature of Ukraine's defense, does not appear to have been adopted by Taiwan. After the Russian occupation of Crimea and the Donbas region of Ukraine in 2014, the Ukrainian government allowed the formation of private militias to make up for deficiencies in the regular Ukrainian army. These militias, although ill-disciplined, ill-trained, and ill-equipped, played a valuable role in the defense of Ukraine using guerilla tactics and, in some cases, engaging in more high-end fighting. These militias were eventually reorganized under official Ukrainian military control, however.¹⁴⁹

Individual Ukrainian citizens also stepped up to defend their country by conducting acts of sabotage and providing intelligence to the Ukrainian military.¹⁵⁰

Although the articles surveyed for this report discussed the potential role of guerilla warfare, the Taiwan government does not appear to plan for popular resistance. Unlike Ukraine's *Resistance Handbook*, Taiwan's *All-Out Defense Manual* covers passive measures that ordinary citizens can take and is meant as a guide for preparing for both natural disasters and war. The Taiwan manual avoids discussions of active measures of resistance covered in the Ukrainian handbook. In addition, the arming of private citizens runs counter to Taiwan's strict gun laws, and the formation of private militias would likely raise C2 issues that the Taiwan government and military would likely find difficult to address.

No discussion of forming an international volunteer unit.

At the beginning of the Russian invasion of Ukraine in 2022, Ukraine authorities called for foreigners with military experience to join Ukraine's military. This call led to the formation of the International Legion for the Defense of Ukraine that is reported to consist of 20,000 personnel. In 2024, Ukraine also began allowing foreigners legally residing in Ukraine to join the national guard and proposed legislation to make it easier for foreigners serving in Ukraine's military to become Ukrainian citizens.¹⁵¹

The Republic of China has a precedent for employing foreign military personnel. The American Volunteer Group (AVG), aka the Flying Tigers, were formed in 1941 by US Army aviator Claire Chennault and staffed by American pilots and ground crews who defended China from Japanese air attacks. The AVG was transferred to US Army control in 1942 after achieving a successful record against Japanese

aircraft. Even so, no source surveyed for this study advocated for the creation of a unit made up of international volunteers. One researcher, however, has advocated for the use of former foreign military personnel with combat experience to train the Taiwan military.¹⁵²

7.3 Importance of uncrewed systems

Uncrewed systems could increase the costs for the PRC and limit the costs for Taiwan.

The use of uncrewed systems has been one of the main features of the Russia-Ukraine war. Taiwan's government and military have recognized the utility of drone warfare in inflicting costs on the PRC and limiting losses to Taiwan. All three military services will expand the use of uncrewed systems, highlighting the multidomain nature of Taiwan's strategy. Although the Taiwan military has committed to acquiring more than 3,200 drones by 2028, media reports that Ukraine's military has 20,000 drone operators, acquired 100,000 drones in 2023, and plans to produce one million drones in 2024 suggest that Taiwan will need to dramatically expand its acquisition of uncrewed systems to meet wartime requirements.¹⁵³

7.4 Necessity of connectivity

Satellite communications promise to undergird Taiwan's network connectivity.

Ukraine's use of Starlink has demonstrated the utility of proliferated LEO systems in combat and their resilience to attack. Through acquiring satellite communication services and planning to develop its own LEO satellite communications network, Taiwan hopes to deny the PRC an information advantage by ensuring Taiwan's government and military can

maintain connectivity within Taiwan and with the rest of the world. In May 2024, the Taiwan Space Agency (TASA) stated that it "plans to launch six low Earth orbit satellites starting in 2026 as part of the government's plan to boost the resilience of the nation's communications."¹⁵⁴

Taiwan's initial effort does not appear to aspire to achieve the level of ubiquity of Ukraine's satellite communications capabilities. Taiwan plans to acquire more than 700 ground-based satellite terminals, which pales in comparison to the 42,000 acquired by Ukraine.¹⁵⁵ Although Ukraine is much larger than Taiwan, Taiwan's plan to place satellite terminals in government buildings appears not to be geared toward maintaining the level of tactical communications achieved by Ukraine through its use of Starlink.¹⁵⁶

7.5 Cognitive warfare concerns

PRC cognitive warfare activities remain an ongoing issue for Taiwan.

PRC cognitive warfare activities are a focus of concern for Taiwan authorities, and Taiwan military researchers acknowledge that PRC cognitive warfare activities predate the 2022 Russian invasion of Ukraine. In this respect, Taiwan's efforts to counter PRC cognitive warfare operations largely draw on its own experience.

Taiwan government and academic documents do not discuss protracted warfare.

Although sources surveyed for this report discuss the deterrent and operational advantage of creating a defense in depth, there is little discussion of Taiwan's options if the conflict should turn into a stalemate. In fact, Taiwanese researchers argue that one reason for a defense in depth is to buy time for the US military to actively become involved in defending Taiwan.

Indicators to watch

As the Taiwan military reforms, several factors could provide insights into how effective the application of these lessons learned will be in Taiwan.

Acceptance of the new conscription and training regime

If observing the Russia-Ukraine war prompts public support and acceptance of new conscripts as well as changes to the conscription and training regime, this could show how lessons learned are having a definitive effect. Public support for conscription has historically been low in Taiwan, but acceptance of the extension of the length of conscription could be an indicator of changing perceptions that could lead to a better trained military. Although citizens may not look forward to being drafted, the main complaint among Taiwan's conscripts previously has been that their military obligation was wasted on impractical training and menial tasks, such as cleaning.¹⁵⁷ More applicable and effective training could address this complaint.

Lengthening the conscription period to one year

Although the lengthening of the conscription period from four months to one year is a major reform, it is unclear whether one year is sufficient to build the necessary skills for effective warfighting. Recognizing this uncertainty, other countries have longer service obligations. South Korea has a conscription period of 18 to 24 months, Singapore a conscription period of 24 months, and Israel has a conscription period of 24 to 30 months.¹⁵⁸ The length of conscription periods is an indicator to continue monitoring.

Prioritizing urban defense

An important indicator of training reform will be how often and how well the garrison force trains in urban defense. The building of urban warfare training centers will be essential to making the garrison force effective in its mission.

More emphasis on civil defense

Transforming civil defense organizations into an effective force capable of protecting Taiwan's civilian population will be an important indicator of Taiwan's commitment to a whole-of-society defense. Efforts could include more and more realistic drills and greater emphasis on teaching basic skills such as first aid and evacuation skills. Given both government-sponsored and private efforts to improve civil defense, this is an area to watch.

Increasing uncrewed system and satellite communication terminal acquisition

The use and attrition of uncrewed systems in the Russia-Ukraine war suggests that Taiwan will need to dramatically increase its acquisition of uncrewed systems of all types to effectively counter PLA operations. Similarly, the number of Starlink terminals used by Ukraine suggests that Taiwan would need to expand the acquisition of satellite communication terminals to effectively integrate them into tactical-level operations. Stockpiling systems now may be essential to mitigating the effects of shortages that could occur later.

Increasing emphasis on popular resistance or expansion of mobilization systems

Although unlikely, a potentially controversial and significant reform would be efforts to promote unconventional warfare tactics to Taiwan's reserve force or, more broadly, to Taiwan's population. Such a move would demonstrate a level of commitment on the part of the Taiwanese to resist a PRC invasion.

Recruitment of foreign military personnel

Although unlikely, the recruitment of foreign nationals to serve in Taiwan's military would be a significant move that could augment Taiwan's shortfall in military personnel. This reform would

likely be expensive because Taiwan military salaries are probably insufficient to attract foreign volunteers. It could also send a signal that Taiwan lacks the will to provide for its own defense.

Predicting national resistance or will to fight is incredibly difficult. However, this study found that Taiwan officials and researchers are taking lessons learned from the Russia-Ukraine war seriously. To recap, the following indicators should be monitored to evaluate how Taiwan is applying its lessons learned: (1) progress on implementation of the current military training program, (2) additional changes to the length of service requirements for conscripts, (3) changes to civil defense systems, (4) acquisition and production of commercial and military-grade uncrewed systems, (5) increases in ground-based terminals necessary for resilient communications, and (6) discussions of popular resistance plans or the potential effects of protracted war or expansion of current mobilization systems.

APPENDIX: SOURCES

Table 1. Main sources used for Taiwan assessments

Publications	Country	Organization(s)	Publication Type
National Defense reports	Taiwan	MND	Official government policy document
Force Structure Adjustment Plan	Taiwan	MND	Official government policy document
<i>Air Force Bimonthly Journal</i>	Taiwan	MND	Military journal
<i>Artillery Quarterly</i>	Taiwan	MND	Military journal
INDSR newsletter	Taiwan	Institute for National Defense and Security Research	Academic journals and articles
<i>National Defense Journal</i>	Taiwan	MND	Military journal
<i>Navy Bimonthly Professional Journal</i>	Taiwan	MND	Military journal
<i>Navy Professional Journal</i>	Taiwan	MND	Military journal
<i>Force Structure Adjustment for All-Out Defense</i>	Taiwan	Legislative Yuan	Official government policy document
Newspaper articles	Taiwan	Central News Agency, <i>China Times</i> , <i>Taipei Times</i> , Taiwan Plus	Media outlets
Global or regional news articles	Japan, US, UK, Singapore	Reuters, <i>Japan Times</i> , <i>New York Times</i> , <i>United Daily</i> , <i>Newsweek</i> , <i>Janes</i> , <i>Foreign Policy</i>	Media outlets

Source: CNA.

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ABBREVIATIONS

AVG	American Volunteer Group
C2	command and control
C4ISR	command, control, communications, computers, intelligence, surveillance, and reconnaissance
CCP	Chinese Communist Party
INDSR	Institute for National Defense Security Research
ISR	intelligence, surveillance, and reconnaissance
LEO	low earth orbit
LY	Legislative Yuan (Taiwan's parliament)
MND	Ministry of National Defense (Taiwan)
MOS	military occupational specialty
NBC	nuclear, biological, and chemical
NTD	new Taiwanese dollar
PLA	People's Liberation Army
PRC	People's Republic of China
TASA	Taiwan Space Agency
UAV	uncrewed aerial vehicle
UGV	uncrewed ground vehicle
USV	uncrewed surface vessel

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