



## Weapons: Social Relevance, Impact and Future

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**Abstract:** Often questions arise whenever we think about weapons, their social relevance, impact and future. Questions like Should weapons be made available to local public in our Country like many other, and if weapons are allowed with proper rules and background checks to common citizens then what will be its effect on Women Safety, Crime Rates, Law and Order management, etc. What are the various types of weapons that can be licensed to citizens, should weapons training be made important or compulsory in our country like many others where military training is compulsory to improve self-defense and improve utility in case of any personal or national emergencies? In This Paper We will focus on such questions and will try to provide their probable solutions. We will also be providing with certain probable situations that might occur if the countries all around the world decide to get rid of their nuclear arsenals and we will also discuss about the future of weapons and weapons in development like Direct Energy Weapons (DEW) or Laser tech Weapons, etc. Direct Energy Weapons are a type of weapons which uses highly focused energy to destroy or damage their targets. These types of weapons are the heart of science fiction movies from Star Wars to Iron Man. Direct Energy Weapons can be used to destroy the target either by the hard kill means destroying them like conventional weapons or soft kill i.e., destroying certain components like board etc. so that enemy loses its ability to operate. Countries like China, Russia, India, United States of America, United Kingdom are developing these types of weapons while Iran and Turkey claim that they have these weapons in their respective active service. Although after decades of research and development Direct Energy weapons are still in the experimental stage only time will tell whether these come to practice use and replace conventional weapons.

**Index Terms - Weapons, Rocket Launchers, Grenade Launchers, Revolver, Rifle, Pistol, License, nuclear weapons, Laser Weapons, DEW, Direct Energy Weapons.**

### Introduction:

Indian authorities have been extremely precise and careful when it comes to allotment and renewing the license to avoid any kind of mischief and misuse done by the gun holder or anyone close/related to him. Law maker of India has ensured that these laws should be revised in a proper time interval so that any individual may not exploit these laws through the mean of any loophole.

A weapon, arm, or armament is any implement or device which will be used with the motive or intent to inflict causality, damage or harm. Weapons are accustomed increase the efficacy and efficiency of activities like hunting, crime, enforcement, self-defense, and warfare. In a broader context, weapons could also be constructed to incorporate anything to gain a tactical, strategic, material, or mental advantage over an adversary or enemy target. While ordinary objects – sticks, rocks, bottles, chairs, vehicles – will be used as weapons, many are expressly designed for the purpose; these range from simple implements like clubs, axes, and swords, to complicated modern firearms, tanks, intercontinental ballistic missiles, biological weapons, and cyberweapons. Something that has been repurposed, converted, or enhanced to become a weapon of war is termed weaponized, like a weaponized virus or weaponized laser.

### Literature Survey:

A gun is a ranged weapon typically designed to pneumatically discharge projectiles that are solid (most guns) but also can be liquid (as in water guns/cannons and projected water disruptors) or may be charged particles (as in a very plasma gun) and will be free-flying (as with bullets and artillery shells) or tethered (as with Taser guns, spear guns, and harpoon guns). The means of projectile propulsion very consistent with designs but are traditionally stricken by a high pressure contained within a shooting tube (gun barrel), produced either through the rapid combustion of propellants (as with firearms) or by

mechanical compression (as with air guns). The high-pressure gas is introduced behind the projectile, accelerating it down the length of the tube, imparting sufficient launch velocity to sustain its further travel towards the target once the propelling gas ceases acting upon it at the top of the tube.

## **Should weapons be made available to local public in India?**

Weapon should not be legalized in India because of the following reason:

1. People in India may not know the relevance of when and where to use the weapon. It might happen that a person use these Weapon as mean of terror and another person use it as a mean of protection either way weapon can cause a great disorder in Indian Society. This may cause a frequent rise in Crime rate across the state.
2. In case weapons are available to public case India might experience a National Emergency very frequently as this may lead to a number of Armed Rebellion in various parts of states causing a great affect in Indian Economy.
3. In case the weapon is made available to Local Public, Common people will hardly Purchase it because of its of its cost for example a Glock17 Pistol cost Rs. 50,000 without ammunicions. This may allow only a little fraction of people will buy it causing a civil disorder.
4. People mainly a fraction of youth may also challenge local authorities with these weapons just to become cool or popular. In some cases, they may attempt some crime causing a rise in juvenile crime.
5. Government will have to introduce a new service or a body as watchdog over the sale, purchase and usage of the weapons.
6. Having Weapons could also lead to rise in homicides and suicides.

## **Effect on various Social problems if weapons are allowed with proper rules and background checks:**

### **Women Safety:**

For women Pocket pistol will be more suitable for safety purpose as they can be easily fit into any lady's money bag or easily carry in lady's vanity bag. These weapons are light as compared to a hand gun or traditional Pistol and is easy to load, although they carry a smaller number of rounds than hand gun or traditional Pistol and require skills to reload and fill the magazine.



### **Crime Rate:**

Crime Rate will Increase there is no doubt in that but the percentage at which it increases it will have many Possibilities. One Possibilities is that India's street may become a battlefield for gang war giving crime rate a big boast. This may cause formation of a number of local gangs and these gangs may fight among themselves or with authorities for power of the region.

Another Possibilities is that if common people start keeping weapons anti-social elements may not try to mess with them but one side-effect is that people may use these weapons to resolve small argument which can be resolve with talk.

Moreover, in many parts of India especially North-central region where many people used weapons during celebration like marriages and birthday parties to show off their power and many people loss their life in these incident and legalizing arms will give rise in these types of incident.

### **Citizen Safety and Law and order:**

Safety of citizen will depend on various factor like crime rate of locality, responsiveness of Police Force and authorities and awareness of people in case of legalization of weapons all of these factors are interrelated. Let's take an example in a city People are aware about their locality and they report any suspicious activity

involving any suspicious person to local Police and they take these reports seriously and check the given information this result in low crime rate thus ensuring citizen safety and Law order.

### **Standard Criterion for Issuing a Weapon:**

License for weapons in India is issued by State Government under the supervision of Ministry of Home Affairs India. Process of getting a weapon license in India is a complicated Process.

To get a weapon license person must fill the following forms,

1. A-1 Application Form
2. S-1 Training Certificate
3. S-2 Undertaking
4. S-3 Medical Certificate

All of these forms are available at the official website of MoHA (Ministry of Home Affairs) i.e., [www.mha.gov.in](http://www.mha.gov.in)

To fill these forms following documents are required

1. Applicant must have an age above 21 years.
2. 4 Passport Size(51mm×51mm) Photograph with white background.
3. Aadhar Card (as per act.2016) as proof of Identification of Applicant in case applicant doesn't have adhere, he/she can submit other Identification Proof like Voter ID card, driving license along with affidavit from court related to it.
4. An address Proof in form of Passport, Electricity Bill or rent agreement.

Now filling the form

1. In application form A-1, applicant will give it basic information like applicant name, his/her father's name, Address (Permanent/Present), Telephone number and nearest police station along with proof. He /She also have to mention reason for carrying weapon (like for self-defense or Sports) along with which type of weapon they require.
2. For S-1 form person may go the nearest police station where he/ she will be provided knowledge related to authorize training center. This form will be sign by a certifying person of that institute along with its seal.
3. The S-2 Undertaking form will be sign by the applicant in which he/ she will declare that he will keep the weapon in safe place away from the reach of the children of his family and he /she will also educate them with about the weapon. He/ she will not carry the weapon in the public place or threaten people near him/ her or public.
4. The form S-3 Medical Certificate will be sign by a medical practitioner along with his/ her registration number this particularly focuses on the physical fitness of the applicant like his/ her weight, height, age, blood pressure and any deformity specially in upper limbs.

### **What are the various kinds of weapons that can be licensed to the Indian Citizens?**

Ans-In India weapons classified in two main categories

1. Prohibited Bore (weapons Used by Indian Armed Forces, Paramilitary and Police Forces)
2. Non-Prohibited Bore (Weapons Used By civilian)

There are number of weapons which come under Prohibited bore some of these include AK-47, M4A1 Carbine, SiG-716, MP-5 etc. they range most every category of firearm (Machine guns, Sub machine guns, Handguns, shotguns, explosives, grenade launchers, rocket launcher). Some of these are been imported from countries like USA, Germany, Belgium etc. depending upon the origin country of weapons, while other are manufacture in India under license by OFB (Ordnance Factory Board). Some Indigenous weapons like INSAS (**I**ndian **S**mall **A**rms **S**ystem) Family is also manufacture by OFB. OFB is also responsible for manufacturing Non-Prohibited bore is also.

There is very limited number of firearms that is to be used by Indian Civilian along with a number of restrictions on citizen who hold a firearm.

List of these weapons are given in the table I





0.32 Revolver Mk-III



0.32 Pistol Mk-II



12 Bore Pump Action Gun (Side Fold)

List of these weapons are as follows: -

Name of Gun	Total Cost (Excluding all taxes) in Rupees	Available Factories
0.32 Revolver	70,000	Field gun factory, Kanpur Small arm factory, Kanpur
0.32 Revolver Mk-III	1,05,000	Field gun factory, Kanpur
0.22 Sporting Rifle	49,500	Rifle Factory, Ishapore
0.315 Sporting Rifle	81,400	Ordnance Factory, Tiruchirappalli
0.22 Revolver	49,100	Rifle Factory, Ishapore
0.32 Revolver long Barrel aka ANMOL	91,300	Small arm factory, Kanpur
0.32 Revolver Mk-IV	77,000	Small arm factory, Kanpur
Modified 0.32 Pistol	68,700	Rifle Factory, Ishapore
0.32 Pistol Mk-IV	92,400	Gun & Shell Factory, Cossipore
0.30-6 Sporting Rifle	1,2100	Rifle Factory, Ishapore
0.22 Revolver aka NIDAR	44,000	Rifle Factory, Ishapore
0.32 Revolver NISHANK	76,000	Field gun factory, Kanpur
0.32 Pistol	72,000	Rifle Factory, Ishapore
12 Bore Pump Action Gun (Fixed)	66,000	Rifle Factory, Ishapore

Butt)		
12 Bore Pump Action Gun (Side Fold)	72,600	Rifle Factory, Ishapore

All of these guns are booked by the person after getting license from the government at a booking cost of Rs.2000 per gun (booking cost is same for all of these guns).

Additionally, 18% GST is added in guns.

### **Are there any loopholes in the current weapons license policies?**

There aren't any loop holes in the current System as the crime commit by licensed gun is very low.

### **Can weapons like Grenade Launchers and Rocket Launchers be customized into riot control devices for law enforcement officials?**

#### **Literature Survey:**

A grenade launcher is a weapon that fires a specially-designed large-calibre shots or projectile, often with an explosive, smoke, or gas warhead. Today, the term generally refers to a category of dedicated firearms firing unitary grenade cartridge. the foremost common type is man-portable, shoulder-fired weapons issued to individuals, although larger crew-served launchers are issued at higher levels of the organization by military forces. Grenade launchers can either are available in the shape of standalone weapons (either single-shot or repeating) or attachments mounted to a parent firearm, usually a rifle. Larger crew-served automatic grenade launchers like the Mk 19 are mounted on tripods or vehicles. Some armoured fighting vehicles also mount fixed arrays of short-range, single-shot grenade launchers as a method of defence. An automatic grenade launcher or grenade machine gun could be a grenade launcher firing rounds in quick succession from an ammunition belt or large-capacity magazine.

A Rocket launcher is a device that launches an unguided, rocket-propelled projectile, although the term is commonly utilized in relation to mechanisms that are portable and capable of being operated by a person. The weapon is supposed to be fired from the proper shoulder and may be fired from either a standing, crouching, or prone position. it's loaded with a clip that holds a collection of 4 rockets together, which is inserted into the rear of the launcher and might be pushed past the launching position to enable the launcher to be carried while loaded more easily.

#### **Solution to the Query:**

Grande Launchers ( Single Barrel or Multi Barrel) and Rocket Launchers are strictly prohibited by the civilian not only in India but also around the globe including countries like USA because these weapons are never built for self-defense these weapons are made to take out heavy targets which are hard to destroy from the ordinary arms and ammunitions like bankers, helicopters, tanks or sometimes taking out a number of people at same time since these weapons can't use for any defense action hence the are banned for civilian user although in UK a person can buy armored vehicle like tanks, infantry fighting vehicle(Tracked or Wheeled) but with two conditions first all the weapons should be removed or neutralize second in case of tracked vehicle metal tracked should be replace or covered by rubber tracked so that it can't destroy the road.

### **Should weapons training be made compulsory in our country to improve self-defense and utility in case of any personal or national emergencies?**

Military Training should be made compulsory in India because this kind of training not only provide fitness and endurance to a person but also gives a got metal health and strong will power which ultimately leads to a healthy. Military training will provide a habit of sports activities in youth.

For implement of such training should not be provide by the school authorities because of two reason first school does not have required staff who can provide this training. Secondly most of School in India doesn't focus in sprots activities.

In case military training become compulsory in India it should be provide by Indian Armed Forces (Army, Navy, Airforce) or by Paramilitary officials under the supervision of a combine department of Ministry of education, ministry of defense and ministry of home affairs.

Although it is nearly impossible for Ministry of education to transport students from various parts of state to nearest military installation in the respective aeras, here come the role of ministry of defense and ministry of home affairs.

The ministry of home affairs can build a separate faculty in villages, towns and cities depending upon the area for example one faculty in small towns or 2-3 faculties in a big city, cities with cantonment areas may need less faculties. In these faculties personal from the Indian Armed Forces or Paramilitary may come to provide training to the youth of a limited age group like 13 years to 17 years.

These training program shall not be treated NCC (National Cadet Corps) because purpose of both of the program is different since NCC's objective is to motivated the students or youth for defense services whereas military training Program will provide them the capacity of soldier this type of military training program will also devolve many other qualities like presence of mind, effective intelligence and Procedural Memory in some cases.

There is good example to prove the above statement. In 1976 Air France Airbus A300 jet airliner was been hijacked by terrorist organization PFLP-EO (Popular Front for the Liberation of Palestine- External Operation) in 27 June and took the aircraft to Entebbe Airport, Uganda. Their demanded release of 40 Palestinian terrorist otherwise they will kill all the hostages. On 30 June the terrorist release 48 Non-Israeli hostages, among these hostages there was a French-Jewish Passenger with military background and procedural memory who provided the IDF (Israel Defense Forces) and they planned and executed a maleficent and greatest surgical strike in military history.

### **Police Protection if citizens are carrying their own weapons:**

Ans- In case the citizens of Republic of India are armed with automated weapons (like assault rifle etc.) then the Indian Police Services must get modern weapons like M4A1 Carbine, SiG 716 etc. Although Some modern weapons like MP5 have been Introduce in Police Forces but they are added in limited number and is only limited SWAT teams most of the Police Personal are using Pistol Like Glock 17, 9mm auto Pistol and assault rifle include AK47 and INSAS rifle along with a large number old Ishapore2A1 rifle and 315" Sporting which is used as a service and ceremonial rifle by the Police Forces. Most of these rifles are outdated and Police Personal have faced many operational issues during the actual combat scenario like 26/11 Terror Attack in 2008 in which Mumbai Police Force and ATS (Anti-Terror Squad) engage the terrorist with Pistol, Revolver, rifle 0.5 and Bamboo stick. Lack of Experience of ATS team with AK47 caused a high rate of casualties in the attack moreover Lack of Experience of Patrol Police Personal created a state of confusion whether it was a gang war or terrorist attack which caused a late of response by higher official.



Kavach LPTA Police Variant

In case the Indian citizens get permission to keep arms then only providing modern weapons and armor is not enough Police Personal will require training to handle these weapons and armor because it will be very difficult to carry and operated these weapons during actual combat as a bulletproof vest weight varies from 9 Kg to 12 Kg alone and Police personal will also have to carry weapons and their magazine which may weight from 6-8 Kg in case of M4A1 Carbine. Moreover, fighting in the street require more skills than in Battlefield because Fighter has to be more aware about ground which he is fighting because the vision is limited by number of obstacles like houses etc., sufficient intel about the enemy, friendlies and non-friendlies to avoid colleterial damage and civilian casualties, since in India where media and social activists is more concern about civilian lives than the lives of Police Personals.

### **Will Countries with Nuclear weapons destroy them to encourage peace and calm, if hypothetically they do, how will it affect the modern world order and systems?**

#### **Literature Survey:**

A nuclear weapon (also called an atom bomb, nuke, atomic bomb, nuclear w a r h e a d, A-bomb, or nuclear bomb) is an explosive device t h a t derives its destructive f o r c e from nuclear reactions, either fission (fission bomb) or f r o m a mix of fission and fusion reactions (thermonuclear bomb). Both bomb t y p e s release large quantities of energy from relatively s m a l l amounts of matter. A nuclear device n o l a r g e r than traditional bombs can devastate a w h o l e city by b l a s t, fire, and radiation. Since they're weapons of m a s s destruction, the proliferation of n u c l e a r weapons c o u l d be a focus of peacekeeping policy. N u



clear weapons are deployed twice in war, by the United States against the Japanese cities Hiroshima and Nagasaki in 1945 during warfare II. On August 6, 1945, the U.S. Army Air Forces detonated a uranium gun-type bomb nicknamed "Little Boy" over the Japanese city of Hiroshima; three days later, on August 9, the U.S. Air Forces detonated a plutonium implosion-type atomic bomb nicknamed "Fat Man" over the Japanese city of Nagasaki. These bombings caused injuries that resulted in the deaths of roughly 200,000 civilians and military personnel. The ethics of those bombings and their role in Japan's surrender are subjects of debate. Since the atomic bombings of Hiroshima and Nagasaki, nuclear weapons are detonated over 2,000 times for testing and demonstration. Only some nations possess such weapons or are suspected of seeking them. The sole countries known to possess detonated nuclear weapons—and acknowledge possessing them—are (chronologically by date of the primary test) US, the Soviet Union (succeeded as atomic energy by Russia), the UK, France, China, India, Pakistan, and North Korea. Israel is believed to possess nuclear weapons, though, during a policy of deliberate ambiguity, it doesn't acknowledge having them. Germany, Italy, Turkey, Belgium, and also the Netherlands are nuclear weapons-sharing states. South Africa is that the only country to possess independently developed so renounced and dismantled its nuclear weapons. The Treaty on the Non-Proliferation of Nuclear Weapons aims to cut back the spread of nuclear weapons, but its effectiveness has been questioned. The modernization of weapons continues to the present day.

### **Treaty on the Non-Proliferation of Nuclear Weapons:**

The Treaty on the Non-Proliferation of Nuclear Weapons, commonly called the Non-Proliferation Treaty or NPT, is a world treaty whose objective is to forestall the spread of nuclear weapons and weapons technology, to mark cooperation within the peaceful uses of atomic energy, and to further the goal of achieving nuclear disarmament and general and complete disarmament. Between 1965 and 1968, the treaty was negotiated by the Eighteen Nation Committee on Disarmament, a United Nations-sponsored organization based in Geneva, Switzerland. Opened for signature in 1968, the treaty entered into force in 1970. PRN by the text, after twenty-five years, NPT Parties meet in May 1995 and agreed to increase the treaty indefinitely. More countries are parties to the NPT than the other arms limitation and disarmament agreements, a testament to the treaty's significance. As of August 2016, 191 states became parties to the treaty, though North Korea, which acceded in 1985 but never came into compliance, announced its withdrawal from the NPT in 2003, following the detonation of nuclear devices in violation of core obligations. Four UN member states hasn't accepted the NPT, three of which possess or are thought to possess nuclear weapons: India, Israel, and Pakistan. Additionally, South Sudan, founded in 2011, has not joined. The treaty defines nuclear-weapon states as people who have built and tested a nuclear device before 1st January 1967; these are the United States, Russia, the UK, France, and China. Four other states are known or believed to possess nuclear weapons: India, Pakistan, and North Korea have openly tested and declared that they possess nuclear weapons, while Israel is deliberately ambiguous regarding its nuclear weapons status.

### **Solution to the Query:**

Countries which have Nuclear Weapons will never Destroy or dismantle their Nuclear Arsenal because all these countries have invested heavily on building their respective Nuclear Arsenal and the technology like nuclear strike capable submarines fleet or surface fleet, missile and bomber, Anti-Nuclear Nuclear Fortress and bunker, Heavily Shielded reserve fleet. Moreover, most of these nations have says that they will use nuclear weapons to protect themselves from their enemy states and there are many examples for that like Russia (Soviet Union) state that they created their Nuclear Arsenal to tackle the domination of Western Countries like USA.

Same is statement is given by China and North Korea. China also states they tested their Nuclear weapons when they have tension on the border with Russia another country with nuclear weapons.

India State that they developed nuclear weapons to protect themselves from the expansion policies of China and Western Countries (USA, UK) which were allies of Pakistan an enemy nation. In 1999 when India Test its Nuclear Capabilities many developed countries including United States, Japan imposed sanctions over India and cut off the humanitarian aids while countries like UK, France and Russia Supported India.

Pakistan State that they had nuclear weapons because India (an enemy nation) operates nuclear weapons.

Israel state that they are surrounded by hostile nation that is why they have nuclear arsenal.

USA (United States of America) States that they have Nuclear weapons to maintain World Peace.

UK (United Kingdom) and France state that they operate Nuclear weapons because of the Expansion of USSR (Soviet Union) and Maintain World Peace.

Most of these nations have ICBM (Intercontinental Ballistic Missile) and Nuclear-powered attack and Nuclear-powered ballistic Submarines along with several surface vessels which are capable of carrying out

nuclear strike across the globe. US, China and Russia operate strategic bomber which are capable of nuclear air-strike. Pakistan doesn't have any kind of ICBM and doesn't have any nuclear capable naval strike group. Although Most of these Countries except North Korea and Pakistan doesn't operate a nuclear-powered attack submarine, and Pakistan doesn't operate any ICBM (Intercontinental Ballistic Missile).

Countries like India, Pakistan doesn't have first nuclear strike polices which means their nuclear weapons can only be use for retaliation i.e., they will not use their nuclear weapon to strike first. While in USA the half of its Nuclear Arsenal is on boarded in 14 Ohio class nuclear-powered ballistic submarine making a single submarine capable of destroying 160 cities or military bases across the globe thanks to its 20trident nuclear missile which has 8 100 kiloton nuclear warheads and a single missile is capable targeting 8 targets.



Ohio class nuclear-powered ballistic submarine

There will another reason these nations will never destroy their Nuclear Arsenal is a threat from an unknown enemy or an alien attack because recently US Airforce and Department of defense has released a number of evidences related to UFO (Unidentified Flying Objects) in public domain and they have started planning a counter attack in case of an alien invasion. Moreover, USA has recently included USSF (United Sates Space Force) for space warfare and defense against the extra-terrestrial threats.

On actual ground dismantling of Nuclear Arsenal is impossible. Let's hypnotically assume that a resolution in UN (United Nation) that all countries will dismantle their nuclear weapons.



In that case dismantling the Nuclear Arsenal will be greater challenge for these countries than creating these weapons as we all know that after decommissioning of USS Enterprise the first nuclear-powered aircraft carrier its was been kept in isolated area until Pentagon find a way to decomposed it nuclear reactor same will be the case with the nuclear warheads which are difficult to dismantle and there will be a chance that during their process of dismantling they may explode or emit nuclear radiation either way millions of people may die.

## **Future of Weapons:** **Direct Energy Weapons (DEW):** **Introduction:**

Direct Energy Weapon is based on highly focusing energy to destroy or damaged hostile targets like drones (UAVs, UGVs), Aircrafts, Missile, Surfaced based targets mobile like vehicle or immobile like bunker, optical devices and even Personnel. Direct Energy Weapons are considered as ranged weapons means they can be used to engage target that are beyond hand-to-hand combat range. Direct Energy Weapons may use highly focused energy in form of Laser, microwaves, particle beam and ultrasonic sound waves. Direct Energy weapons can be used for both lethal and non-lethal purpose in a battlefield. Direct Energy Weapon not only destroy the target both can be used to put the hostile target in state of oblivion where the target will does have any connection with its allies thus creating a high chance of failure and error. Mankind haven't used direct energy as active weapon means to attack hostile target, but we have been using direct energy as a passive weapon like monitoring sky and surface of friendly areas, detecting hostile target, contrasting between friendly and hostile, jamming, intercepting, and tracking enemy commutation.

Defense focused countries has like China, Russia, India, United States of America, and United Kingdom started working and developing these kinds of weapons at their respective level and potential some of them



has started in in 1980s and some of them started the program few decades ago. Turkey and Iran claim that they already commissioned direct energy weapons in their respective Armed Forces although there aren't any detailed or efficient information available in the public domain about their respective system. Moreover, Turkey and Iran don't provide any official information related to their respective weapons.

There are numerous organizations in these countries have been working to develop Direct Energy Weapon technology for decades although they are using a different type of principle in their technology there. These organization have done some success in their respective technology and some. Some of these countries official state that they have used their system in actual field but didn't provide sufficient evidence to support their claim. Moreover, there aren't any specific detail of these weapon in public domain. Thought information about some of these Direct Energy Weapons Like K.A.L.I or Laser Weapon System have been shared to public by government official in various occasion. There are various rumors around the globe that some of these countries have used their respective Direct Energy Weapon in actual field but official of respective countries denied these claims officially. Some of the gathered intel about the Direct Energy Weapon is given in below table II.

Country	Organization	Weapon name	Principle	Status
China	GAD	Unknown	Microwave or Laser Based	Active/Operational
India	DRDO, BARC	KALI	Electron Accelerator	Classified
India	DRDO	Durga II	Laser Based	Under Development
Russia	Unknown	Peresvet	Laser Based	Active
Turkey	ROKETSAN	ALKA	Electromagnetic/Laser Based	Active
Iran	Unknown	Unknown	Unknown	Active
United Kingdom	BAE, Leonardo	Unknown	Laser/Radio Frequency Based	Under Development
United States of America	DARPA	Hellads	Lased Based Weapons	Operational
United States of America	Air Force Research Laboratory	Thor	Counter-Swarm Electromagnetic Based	Operational
United States of America	U.S Army CCDCAC, Northrop Grumman	THEL	Lased Based Weapons	Operational
United States of America	NRL, Kartos Defense	AN/SEQ-3	Lased Based Weapons	Active and Operational
United States of America	RAYTHEON	A.D.S	Microwave Based	Active and Operational
United States of America	SNC,WBC	M.E.D.U.S.A	Microwave Based	Operational
United States of America	Boeing	Boeing YAL-1	COIL*	Retired
United States of America	Air Force Research Laboratory, Boeing	S.H.I.E.L.D	Laser Based	Under Development (F-15 Eagle II)
United States of America	Lockheed Martin	T.A.L.W.S/ A.T.H.E.N.A	Laser Based	Under Development/ Operational

Table II



S.H.I.E.L.D Below F-15 Eagle II

### \*COIL Chemical Oxygen Iodine Laser:

- Most of these weapons are in experimental Phase although some of these weapons are being in use in non-combat Condition like KALI which is used for removal of snow over the tunnel during winter in the areas like Ladakh, while some of them has been tested during Military drill by U.S. Navy like AN/SEQ-3 aboard USS Ponce (LPD-15).
- ADS and MEDUSA are non-lethal direct energy weapons and ADS has been in War of Afghanistan as a measure of crowd control thought ADS has sued for Human Rights Violations which are denied by various court.

### Literature Survey:

Science Fiction movies or books are been using direct energy weapons as a main armament ever since 1930s, but the concept of direct energy weapons is way older than you imagine.

According to legends, Archimedes created world's first direct energy weapons in history its was named burning mirror. Burning mirror used a set of mirrors with adjustable or flexible focal length arranged in a series along the shore or beach, all these mirrors were used to focus their respective reflected rays on single ship at a single point. At that point temperature rise to the ignition point of the wood and eventually setting the ship on fire. In this way the whole fleet can easily defeated before the landing squad could reach to shore. This weapon was used in destroy the Roman Feet as they invaded Syracuse. Some attempts had been made to recreate this feat but all of them were a partial success like a group of MITs presented a mirror-based weapon which was most close to the feat.

Although this weapon had given a concept of laser-based weapon and showed that Electromagnetic waves could be used as a weapon.

In year 1935 war is about to start in Europe that will consume the whole world. Superpowers have started to preparing for a war to come. British Ministry of Air approach Sir Robert Watson-Watt and his colleague Arnold Wilkins for develop of Death Ray a theoretical weapon-based particle beam or electromagnetic waves. Though Sir Robert and Arnold quickly concluded that weapon like death ray was not feasible for practical usage but propose a theory that radio way can be used for detection of aircraft and other object thus development of RADAR started in Britain.

In World War II RADAR showed its importance to world and proved to be a great assert for Allied Forces. Today without RADAR military forces will be blind.

### Operational Advantages and Applications:

Direct Energy Weapons have a wide range of Advantages and Application over conventional Weapons.

1. Direct Energy Weapons can be used Strategically and Stealthily as it is using the spectrum above or below the visible spectrum thus hostile target or enemy will didn't see it coming. Moreover, these weapons will not create sonic boom or other noise providing enemy a limit time to response or perform escape maneuver.
2. Direct Energy Weapons uses electromagnetic waves these waves are unaffected by natural factor such gravity, windage and Coriolis Force providing it an accurate flat trajectory. Hence reducing the chances of error and make aim more precise and enlarging the range to line of sight.

3. Direct energy weapon which are based on laser or electromagnetic principle will travel at speed of light this not only reduce the time of reaction for the hostile target but also can be used for space warfare because of their infinite range.
4. Direct Energy Weapon eliminates the logistical problem by eliminating the need of ammunition supply. These class of weapon can be operated on power source.
5. In some cases, direct Energy Weapons will be cheaper than conventional weapons like Missile, because a missile destroys itself after hitting its target hence needed to replace by another missile moreover, there is a chance that the missile can be destroyed by SAM (Surface-to-Air Missile) or CIWS (Close in Weapon System) before it can reach to the target causing a loss.
6. Direct Energy Weapons eliminates the reloading issue as it takes time to reload a missile in a warship or in mounted truck. Moreover, the updated missile may require more space than the previous version in that case whole VLS (Vertical Launch System) of a warship has be change. This may take a long time which means that the warship has be operational for that period.
7. Modern Weapon system can be used for a specific purpose like Brahmos missile system can be used as an Anti-Ship Purpose while Barak-8 Can only engage airborne target while Direct Energy Weapons are highly versatile in nature it can destroy or damage Airborne hostile target like Aircraft or Missile and Surface Based target like Vehicles or Boats although it is not confirmed that these weapons may or may not destroy armored targets like Tank, APCs(Armored Personnel Carriers), AAVs(Assault Amphibious Vehicles) but they can surely damage them and make them immobile and defense less an easy target for conventional.
8. Direct Energy Weapons can also be used for a Covert Operation, as these weapons only destroy the hostile target while on other hand conventional long-range weapons when destroys a target it leaves some of its parts which can be recovered by the hostile nation and can be used as an evidence against the Operating Nation in United Nation.
9. Direct Energy Weapons can also be used for surveillance and reconnaissance mission thanks to their infinite range of operation. Moreover, these weapons have wide spectrum which make them useful for a variety of operation like costal patrol, border patrol, maritime surveillance, anti-piracy operation, special operation and many more.
10. Direct Energy Weapons can be used for electronic warfare in the battlefield where these weapons can be used for jamming enemy commutations and radar this many create scenario of chaos among the enemy troops and making them inefficient to react.

### **Operational History:**

Thought Direct Energy Weapons are in Experimental stages but of them has been used by the military in active service but only few of these weapons have been used in actual combat condition as per the government or military official. These Weapons are used as both active as well as passive way for lethal and non-lethal purpose. There are also many claim and rumors that some countries have developed and used the Direct Energy Weapons in past, these claims come from the non-official sources such as investigative journalist, retired government official and conspiracy theories some of them provide evidence while some not.

1. Late February 2020 a U.S Navy Aircraft P-8 Poseidon conducting a routine surveillance of Chinese Warship and Installation over the Spratlys Island in disputed area of South China Sea, where People's Liberation Army Navy Warship Constantly petrol Chinese man-made island. According to Pentagon when P-8 Poseidon is flying over one of the Chinese man-made islands a Chinese Destroyer target the aircraft using military grade Laser System. The Laser is directly Pointed to the cockpit of the aircraft temporally blinding the pilots although pilots regain their vision soon enough and able to control the aircraft. After this incident US Navy warn China through its Instagram say that you don't want to play Laser Tag with us.
2. During India-China Standoff 2020 Chinese official claim that they have used microwave-based weapon against Indian Troops on Pangong Lake. Jin Canrong, Dean of School of International Studies which comes under Renmin University also stated the same in a TV Program on 11 Nov 2020. Although Indian Army and its higher officials denied the allegation and said that the claim is baseless.



3. According to Turkish Official, Turkish Forces Used ALKA Direct Energy Weapon mounted on an armored vehicle and take down a Chinese Unmanned Ariel Vehicle Wing Loong II on 4 August 2019 at Misrata in Libya.
4. On 7 April 2012 a massive Avalanche stuck the Pakistani Army Headquarter around 2:00 a.m. local time i.e., Pakistani Standard time. At least 133 people (including soldier and civilian contractor) were died in this avalanche. It was the deadliest Avalanche ever hit the Pakistani Headquarter. Some Pakistani media and conspiracy theories said that Indian Research and Analysis Wing and Indian Armed Forces is responsible for this attack they claim that India used KALI Kilo Ampere Linear Injector aboard on 2 IL-76 aircraft escorted by 6 Dassault Mirage 2000 and 2 Sukhoi Su-30 MKI is used to penetrate Glacier triggering the avalanche. These organization had given Radar Images showing the mentioned aircraft in region before avalanche, presence of the officials from DRDO and BARC in the Siachen training with Indian Army and unusual timing of the avalanche.  
Few years later in 2016 a book named as Told and Untold Operation of Indian Military mentioning the same incident as a Military Operation which was designated as Operation Whitewash.
5. In 2014 USS Ponce an Amphibious Transport Dock of Austin class was equipped with a prototype of Laser Weapon System designated as AN/SEQ-3. USS Ponce was used as a test platform for the weapon after which it was planned that the AN/SEQ-3 will be install on other ships like Arleigh Burke class destroyer, Littoral Combat ship (Independence class, Freedom class). During its trail on the USS Ponce AN/SEQ-3 had taken down various target like UAVs, Fast Patrol Crafts and Helos. Moreover, AN/SEQ-3 had also counted surveillance operation over the Persian Gulf. In 2018 USS Ponce was decommissioned and AN/SEQ-3 I was moved to more advance and stealthily USS Portland another Amphibious Transport Dock of San Antonio Class.
6. Boeing YAL-1 is an Airborne Laser Weapon System which was mounted on a Boeing 747-400F. Its Primary role is to destroy tactical ballistic missile in the boost phase. It is based on Chemical Oxygen Iodine Laser or simply known as COIL, it a class of infrared chemical Laser and has an infrared red beam and capable of continuous mode of power scaling up to megawatt. YAL-1 took its first flight with low power laser in 2007 and used a high-energy laser to intercept target in January 2010. YAL-1 had successfully destroyed 2 test missiles in the same month. Unfortunately, due to lack funding the program was cancelled in 2011 and Boeing YAL-1 made its final flight on 14 February 2012 to Davis-Monthan Air Base in Arizona. Boeing YAL-1 was ultimately scrapped in 2014.
7. Active Denial System (ADS) also known as the Heat Ray is the only non-lethal direct energy weapon that had been used or deployed in actual combat ground. ADS has been deployed by U.S Army in War of Afghanistan on January 2010 where it is been used for crowd control and perimeter security from unarmed civilian or unwanted visitor. Unlike other Direct energy weapon ADS is based on microwaves and is ineffective against military asset like UAVs, Armored Vehicles etc. ADS fires a 95 GHz high-powered beam on the target causing an exciting of water and fat molecules in the skin which resulting in heating of skin to a temperature of 44°C and slightly higher this gives the target a burning sensation. Although ADS was very cost efficient and effective than other crowd control system like tear gas, water cannon but has been withdrawal in August 2010 as many Human Rights Activist filed many petitions in American Courts against it claiming that its gives first degree burn which generally occur at 51°C.



AN/SEQ-3 firing from USS Ponce in infrared spectrum.

### **Impact of Direct Energy Weapons:**

- Direct Energy Weapons are the weapons of future. These weapons are capable of causing destruction of hostile target somewhat near to conventional weapons like missile etc. these arms have their own advantages and disadvantages Direct Energy Weapons doesn't required any logistic support like Artillery Guns or Naval Artillery Guns but its applications are limited to certain fields. Direct Energy Weapons cannot be used for Anti-Submarine Operation as the operation of Laser or other Direct Energy Weapons can cause a high vibration on platform resulting in creating a lot of noise which can be easily detected by passive sonar and can be easily targeted by Homing torpedoes because of this reason Direct Energy Weapons cannot be used in areas which don't have a solid or unstable platform like Mountain cliffs, Desert Platform, Glacier.
- Another disadvantage of direct energy weapons which are operational today is that it requires a large amount of energy hence if they are mounted on Aircraft like F-15 Eagle II in form of SHIELD they cannot be operational for long time i.e., it can be used for 2-3 times before its drain away otherwise the system will divert the power from other essential equipment like weapon control radar or life support.
- Direct Energy weapons cannot be applicable for submarine operation they neither be mounted on submarine nor used for anti-submarine due to phenomenon of refraction which will create a problem of targeting in sea water due to difference in temperature.

### **Conclusion:**

- Revising the points that for women Pocket pistol will be more suitable for safety purpose as they can be easily fit into any lady's money bag or easily carry in lady's vanity bag. These weapons are light as compared to a hand gun or traditional Pistol and is easy to load, although they carry a smaller number of rounds than hand gun or traditional Pistol and require skills to reload and fill the magazine.
- Also, we know that safety of citizen will depend on various factors like crime rate of locality, responsiveness of Police Force and authorities and awareness of people in case of legalization of weapons all of these factors are interrelated. Let's take an example in a city People are aware about their locality and they report any suspicious activity involving any suspicious person to local Police and they take these reports seriously and check the given information this results in low crime rate thus ensuring citizen safety and Law order.
- Indian Government has been very careful and protective when it comes to arms laws or arms acts as a minor error in these laws can create a massive chaos in the region.
- Law maker of India has ensured that these laws should be revised in a proper time interval so that any individual may not exploit these laws through the means of any loophole for example in 1959 Arms Act has been passed in Indian Parliament which replaced the Indian Arms Act of 1878 and in 2010 Arms Act has been revised through 95th Amendment of Indian Constitution.

- However, this Act has been challenged on the base of air gun in Supreme Court of India thought petition has never been by court on various ground.
- Arms Act of 1959 or 2010 provide a very detailed information about the sale, purchase and usage of these weapons and is appreciated by various arms and ballistic expert not only in India but also the globe because of its limited weapons and arms range and lengthy paperwork.
- Thought Indian Arms paperwork is lengthy but it reduces the chance of miss use of weapon by any individual as it consists of detail background of individual and his/her family, reason behind the purchase of weapon and whether the weapon listed by individual is fit for the purpose required. These are the reason behind the low crime rated committed by person in India.
- However, crime committed from the non-registered weapon or illegal weapons has been rising over the years. Though both type of weapon legal or illegal weapons which are allowed for Indian civilian population is made in Indian factories but the legal weapons are made in selected factories i.e., specific gun is made by a specific factory which comes under Ordinance Board of India these guns are made in supervision of engineers from proper raw materials while illegal weapons are made in factories which does have proper engineers and expert worker and are made from cheap material for example the barrel of these gun are made from metal pipe which has lesser operational range and is dangerous for gunner as they may backfire.
- Indian authorities have been extremely precise and careful when it comes to allotment and renewing the license to avoid any kind of mischief and misuse done by the gun holder or anyone close/related to him.
- Talking about the Future of Weapons especially about the DEWs we saw that, Though Direct Energy Weapon is the weapon of future, but this class of weapon require several experiments, field testing and research and development to remove its flax.
- Direct Energy Weapon in real life is very different from the reel life. We hope that through this paper we have answered all the questions asked above about various concerns regarding the social relevance and future of weapons.

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