GO BEYOND

SOCIAL IMPACT OF GENERAL AVIATION

A COLLABORATION WITH BUSINESS AIRCRAFT OPERATORS ASSOCIATION (BAOA) OF INDIA

MARCH 2020

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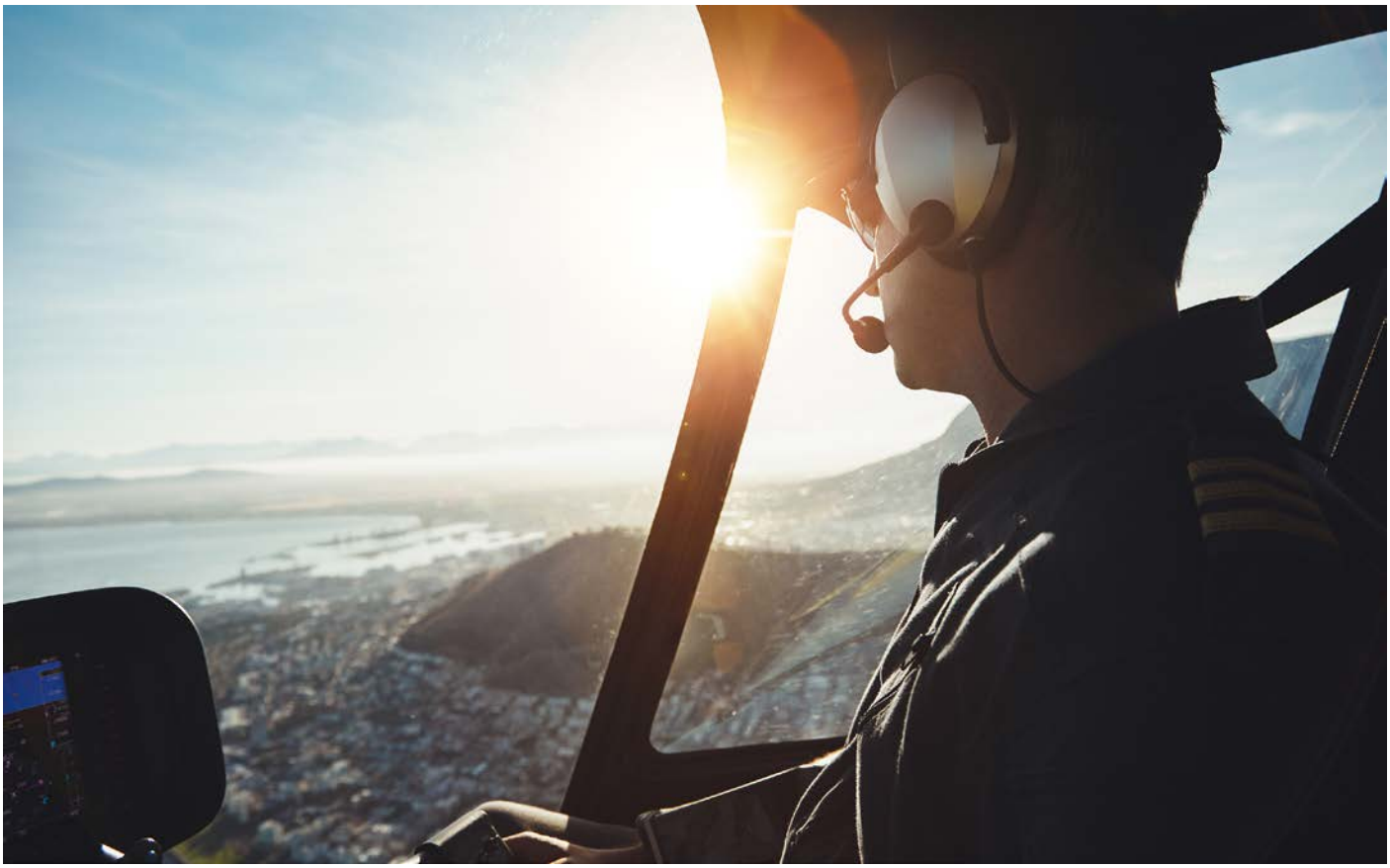

FORWARD

Business Aircraft Operators Association (BAOA) of India came into being in 2011. Since then it has focused on securing optimal growth of general aviation and business aviation (GA/BA) in India.

In 2012 BAOA worked with ICAO on its Technical Cooperation Bureau (TCB) project to prepare a study, “Roadmap for development of GA/BA industry in India.” This report forecasted the aircraft fleet in India to double by 2020, with conclusions based on earlier growth figures and existing potential. The fleet size, however, remained relatively static as per the Ministry of Civil Aviation’s report released on the eve of the aviation summit in Mumbai in January 2019.

Following this, BAOA decided to team up with Pratt & Whitney to prepare a forward-looking document, with case studies and assessments based on similar global experience, with a focus on optimizing the potential of GA/BA growth in India.

This report focuses on three areas most important to India: remote air connectivity, emergency medical services (EMS) and disaster management. Pratt & Whitney’s team of experts examined changes effected by nations with similar conditions to optimize GA/BA potential in these areas. The team has described financial models that have been successful elsewhere and how, with due modifications, they could be adapted in India.

BAOA will make use of this document to work on the ministry’s vision to make GA/BA an integral part of India’s aviation ecosystem – one driven by EMS, disaster management, regional connectivity and tourism. With the “elitist” tag for GA/BA now gone, our focus can turn to adequate infrastructure, proportionate (but completely safe) regulations for smaller aircraft, and the current tax differential. We shall aim to grow GA/BA in India seven-fold, with an additional 200 amphibious aircraft to serve India’s coastlines and waterbodies.

Happy landings!

R.K. Bali, Managing Director
Business Aircraft Operators Association (BAOA) of India

BUSINESS AIRCRAFT OPERATORS ASSOCIATION

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EXECUTIVE SUMMARY

The aviation industry has long been dominated by government activities like national defense and commercial pursuits like passenger travel. There is also a third and rapidly growing area of “social missions” with societal benefits like patient transport, disaster response and recovery and more.

Many emerging countries are looking for ways to develop better models and methods to lift up their citizens, from connecting remote communities to the broader economy, to ensuring fast and reliable access to medical attention, to helping citizens through natural disasters. This report looks at the many ways that nations around the world are building success in these important areas.

EMERGENCY MEDICAL SERVICES (EMS)

The surge in EMS activity is due to a growing need for the **fast transport of critical patients during the “golden hour” and government initiatives to improve healthcare.**

Despite the historical rise in EMS fleet and structured business model, developed economies still face challenges such as high operation cost, more out-of-network transport, fewer landing zones, more time for operational clearance, and night flying restrictions.

Emerging economies like China are seeing tremendous potential for EMS due to a rise in healthcare expenditures, regulatory relaxation, EMS operational subsidies and a plan to develop more landing zones.

REMOTE AIR CONNECTIVITY

An air connectivity ecosystem can aid the social and economic development of remote regions.

Geographical position and low population density can make remote routes less profitable or unprofitable. Governments, therefore, are working to support remote air connectivity with financial assistance, regulatory liberalization and more sustainable infrastructure.

- Potential routes are identified based on factors such as population density, distance from a hub and availability of revenue streams like cargo and tourism.
- Local, state and provincial governments play a vital role in the development of remote routes.

DISASTER MANAGEMENT

Firefighting:
With wildfires becoming ubiquitous around the world, countries are banking on global efforts and multi-nation pacts to fight fires in addition to their own firefighting mechanisms.

National and sub-national firefighting agencies have traditionally depended on two models to deploy firefighting assets: ownership/leasing and exclusive contracts. However, due to budget cuts, the industry has been moving towards call-when-needed (i.e. pay-per-incident) contracts.

Search & Rescue:
Countries are moving away from traditional ways of using the military or coast guard, with dedicated private players now being offered contracts for specific periods of time.

EMERGENCY MEDICAL SERVICES (EMS)

OVERVIEW

Traditionally, aeromedical emergency services have been carried out through military deployments. However, due to an increasing need for quick and practical transport for patients, EMS services have been moving into the civilian space in the last few decades. The need is great: in the United States, for example, 550,000 patients use air ambulance services each year.

KEY GROWTH ENABLERS

Over the years, factors like increased healthcare spending, advancements in technology and aging demographics have supported growth in the air EMS market.

AGING DEMOGRAPHIC[1]

2X increase in population of 60+ years globally by 2050.

FAVORABLE POLICIES[2]

Supportive reimbursement policies and community awareness.

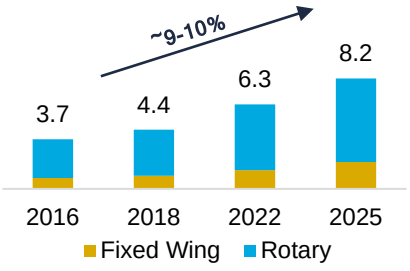
GOV'T AND CSR INITIATIVES[1,3]

Increased spend and commitment to CSR initiatives from multiple organizations are pushing growth in community-based services.

REGIONAL DYNAMICS[3]: A concentration of aircraft in mature markets has been driven by structured reimbursement policies, advanced infrastructure, favorable government initiatives and the presence of a large operator network. Markets like APAC are also seeing fleet growth, supported by government initiatives in the healthcare sector and increasing per capita healthcare expenditures.

FLEET PENETRATION IN EMS[4,5]

EMS MARKET SIZE (US$ BILLION)



Source (s): Market Research Highlights ORG

HELICOPTER: Higher penetration in the EMS segment is mainly due to landing flexibility and the ability to transport patients within the "golden hour," thereby helping reduce the mortality rate.

Helicopter EMS (HEMS) operation in the US is mainly with visual flight rules (VFR), thereby restricting activity in adverse weather conditions like low visibility, rain, sleet, snow and high winds.

FIXED WING: Fixed-wing operations gained a higher demand for long-distance patient travel (e.g. between airports, primarily for inter-hospital transfers). Aircraft can fly at more than 250 mph with instrument flight rules (IFR), meaning they can fly in more difficult weather conditions without adding substantial risk. The overall cost of fixed-wing operation is comparatively less per mile when compared to rotorcraft.

Fixed-wing MEDEVAC operations are more affordable than HEMS rotorcraft. However, fixed-wing services account for only 33% market share in the US compared to 66% share of rotary-wing services[6].

TYPES OF SERVICES OFFERED[7]

Primary Response – Emergency

En route treatment through paramedics/flying doctors and patient transfers from the scene

Secondary Response – Non Response

Non-emergency situations like travel for a planned treatment or patient transfers from rural to urban

Specialty Medical Retrieval

For special cases like neo natal/pediatric emergency

EMERGENCY MEDICAL SERVICES (EMS) [4,5,8,9]

TYPES OF OPERATING-BUSINESS MODELS ON OFFER

1. HOSPITAL-BASED

Also referred to as "traditional model/approach"

Hospital affiliated (department of a hospital or group of hospitals) operated either for-profit or not-for profit: the group has complete control over business decisions with the provision of staff and medical services. The aviation component (i.e. pilot, aircraft and maintenance) is managed in-house or a contractual agreement is used to avail services from air ambulance providers.

- EMS providers participate in a competitive bidding process to secure long term contracts with the hospital to maintain a steady flow of patients (first call privileges) thereby providing an assured revenue stream.
- Fixed monthly fee, plus a per-flight-hour fee are mainly used to pay the operators. Operators earn minimum defined revenue, irrespective of the aircraft utilization level.

Hybrid model: through this model, the collaboration between an independent air ambulance provider and the hospital is formed, but the hospital still provides the staff and medical services. However, in this case, the independent provider holds business decision making power (price-setting being a prime one).

2. GOVERNMENT RUN/FUNDED

Operated via civil or government organization

- Government-run organizations generally own and operate the air ambulance. These could be the military, a state or municipal arm or other publicly-funded group.
- Civil approach / public-private partnership is mainly executed through the tender process headed by the national or local government. The contracts are long term (5Y/10Y) with specified requirements such a time-bound flying hour.

These contracts might include other services such as search and rescue (SAR) or disaster assessment.

3. INDEPENDENT

Also known as the "community-based model"

- Under this model, operations are tied with a medical institution and providers may fall under the category of for-profit or non-profit.
- The providers either employ the flight crew and medical service provider directly, or they use a shared-cost model (i.e. aircraft, pilots and facilities are shared with other organizations).
- The flow of patients is not steady in this model as providers need to compete with each other for transfer referrals in the same region.

The for-profit organization generally uses a fee-based model for EMS services, which is then covered by insurance companies, public health services or liable parties.

Non-profit organizations generally depend on donations or charities with collation of funds from patrons (e.g. REGA, a non-profit organization in Switzerland) or funds received from the business itself or from outside organizations (e.g. ADAC, Germany's largest automobile club).

EMERGENCY MEDICAL SERVICES (EMS)

REGULATORY SUPPORT FOR EMS OPERATIONS: COUNTRY EXAMPLES

INVESTMENT, AIRPORT CHARGES AND AIR-SPACE RELAXATION [10,11, 12, 13, 14, 15, 16, 17, 18, 19]

In many countries, EMS operations are successful as a result of government investment towards favorable policies like air-space relaxation and reductions in airport charges, among others.

- **RUSSIA:** EMS/air ambulance service in Russia falls under the government's national priorities. Through 2018 government had invested ~US$0.6 billion in EMS projects. In 2017 the health ministry designed a plan to provide medical services to 34 remote provinces of Russia by 2019.
- **CHINA:** The country made strategic investments in the healthcare sector with an increase in spending from US$579 billion in 2014 to ~US$900 billion in 2019, which paved the way for the procurement of several EMS helicopters during this period. While China is working on policy reform, certain hurdles remain like lack of integrated emergency response, high entry costs, high costs for end-users of aeromedical operations, lack of a defined legal and regulatory framework, and infrastructure challenges.

POLICIES/REGULATORY RELAXATION

- Airspace relaxation in China: airspace under 1,000 meters now accessible to GA aircraft
- No additional airport charges for emergency flights
- Adjustment of GA airport fee structure with no charges for non-profit activities (medical rescue or use)

OPERATIONAL CLEARANCE [20, 21]

- **JAPAN:** The country restricts helicopters from landing outside authorized airports and heliports. However, in EMS operations, the government allows a helicopter to land even outside these places without application for prior permission.
- **EUROPE:** Countries like France require an "off-airfield" license while others, such as Holland, request permission from the local police, while Italy requires written notice in advance from the local authorities. In the UK, the landing in a temporary landing site or private landing site is permitted with owner's permission for a maximum of 28 days in a calendar year.

FLEET COMPOSITION – SINGLE VS. TWIN (HELICOPTER/FIXED WING) [10, 20, 22]

- Fleet composition varies with geography, government safety standards and operating costs. For example, twin-engine helicopters are a prerequisite in Japan, whereas both single and twin (fixed-wing and helicopter) fleets hold a significant share in major markets like the US, Australia and China.
- Fleet transition in the US: twin engines have gained popularity in last four years due to a shift in operator preference for instrument flight rules (IFR) programs and the changing needs of the population for comprehensive service in helicopters (e.g. adding medical equipment and in-flight medical support).

EMERGENCY MEDICAL SERVICES (EMS)

REGULATORY SUPPORT FOR EMS OPERATION

LANDING ZONES AND ON-SITE HELIPORT IN THE HOSPITAL [23, 24, 25]

Globally, countries are focusing on developing landing zones (especially in rural regions), heliports at hospitals, and higher penetration of locally authorized landing areas (like public school playgrounds, public agencies' office spaces, city parks, stadiums, national parks and riverbanks) to enhance coverage and reduce travel time to specialized medical centers.

- **JAPAN:** ~200 designated landing zones have been identified during the initial phase.
- **UNITED STATES:** Helicopter bases have increased from 752 in 2012 to 868 in 2017. This led to a 23% increase in the total service area during the same period. Apart from helicopter bases, EMS providers have added 36 sites to their fixed-wing bases during the 2012-2017 period.
- **KOREA:** Few provinces have allowed for the landing and take-off of helicopters from public agencies, school playgrounds and parks. However, Gyeonggi Province collaborated with Gyeonggi Office of Education and Ajou University Hospital in June 2019 to increase the number of helicopter landing zones at the provincial government office.

RECRUITMENT AND RETENTION [20]

At a global level, the industry is facing a severe shortage of experienced EMS professionals. To address this situation, governments across countries are taking steps to reduce the staffing gap:

- **UNITED STATES:** Grant to rural agencies which provide emergency medical service training and equipment assistance.
- **JAPAN:** Reduction in minimum flight hours from 2,000 to 1,000 for captains to increase the pool of pilots. However, individual operators can also set their own requirements, such as 50 of 1,000 flight hours being logged on the same aircraft.

NIGHT HEMS OPERATION/INNOVATIVE TECHNOLOGY [26, 27, 9]

Countries and federal bodies are taking the initiative to encourage the use of night vision goggles (NVG) and night vision imaging systems (NVIS) for appropriate missions. Some governments are already working towards drafting a standard for NGV operation that takes differences between aircraft into consideration, since they are not a one-size-fits-all solution.

- **UNITED STATES:** FAA has approved ~53 NVG supplemental type certificates (STCs) which include EMS helicopter configurations. The government has also laid down some regulations for fixed-wing aircraft, e.g. 45-minute reserve for night visual flight rules (VFR), while the daytime minimum is 30 minutes.
- **FRANCE:** Granted permission to run nighttime HEMS operations using NVIS for six months starting December 2019 on a trial basis.
- **EUROPE:** In 2018, EASA put forth an amendment proposal for enhancing safety of HEMS operations (with and without NVIS). A decision on the same is expected in 2Q 2020. The proposal mandates NVIS operation for HEMS at non-pre-surveyed operating sites outside well-lit areas. Non-NVIS operation at night at pre-surveyed sites is possible, with obstacle data at such sites updated on a regular basis.

EMERGENCY MEDICAL SERVICES (EMS)

ASSISTANCE (FINANCIAL/RESOURCE) TO CONSUMERS IN LINE WITH OPERATING MODELS

DEVELOPED MARKET – GOVERNMENT AND PRIVATE/COMMERCIAL INSURANCE PLAN [28, 29, 30, 31]

Air ambulance payment provider space includes national health insurance program (like Medicare and Medicaid in the US), commercial insurers and self-payers (i.e. individual patients).

- Base fee plus mileage at a per-minute rate is used as a method to bill and reimburse the air ambulance services.
- Another approach in the US is based on a membership program, charged annually from an independent air ambulance provider, which covers the cost of air transport.
- Certain US state legislatures are trying to mandate coverage for air ambulances or to regulate the air ambulance reimbursement rates, regardless of in-network or out-network provider.
- Operators are also working towards the same initiative by adding an increasing number of in-network health insurance agreements.

Apart from financial assistance, few operators are trying to maintain regular medical supplies for rural areas. One of the significant US-based EMS operators has partnered with a humanitarian organization to carry blood or plasma on its aircraft – aircraft which are not associated with a regional blood center or health system. It is expected to provide access to remote regions which have limited air medical resources.

EMERGING MARKETS – GOVERNMENT AND PRIVATE/COMMERCIAL INSURANCE PLAN TO AID AIR MEDICAL SERVICES [32, 33, 34]

COUNTRY EXAMPLES

- **JAPAN:** Annual subsidies are borne 50:50 by the Ministry of Health, Labor and Welfare and by the local government. Patients pay only for their medical treatment. In some cases operators cover a certain percentage of the medical helicopter service, based on the type of fleet deployed.
- **KOREA:** Operators receive funding from the government (70% from the Ministry of Health and Welfare and 30% from municipal governments) to finance their operating costs, while hospitals are responsible for providing the medical personnel.
- **CHINA:** Fee-for-service is the most common payment structure in the region. However, one of the biggest EMS operators is working with insurance providers to create a viable insurance structure for the general public.

EMERGENCY MEDICAL SERVICES (EMS)

KEY OBSERVATIONS

Despite the exceptional capabilities of air EMS to provide medical services within "golden hours", penetration is limited to few regions, mostly in developed markets, mainly due to high operating costs and the risks involved in airborne operations.

GLOBAL VIEW:

- At present, the industry is operating based on three significant models: hospital-based, government-run, and independent.
- The first two models support air ambulance operators with a steady flow of patients **(first-call privileges) or revenue stream (long-term contract)**. The approach for the third model can be for-profit (a fee-based model to support the revenue stream) or non-profit (mainly dependent on donations or charities).
- The government-run models such as public-private partnership (PPP) or full government funding are gaining importance vs. the others. This is primarily due to a steady flow of patients, a fixed revenue stream and secondary missions (e.g. search and rescue or disaster assessment) acting as growth opportunities.

Despite significant growth in medical evacuation in both developed and emerging markets, the segment requires financial assistance from the government and other participants, such as operators and insurance providers.

- The government is either supporting patients by **offering national health insurance with specific eligibility criteria** (mainly used for reimbursement of air ambulating billing costs) or providing financial aid to EMS providers through a collaborative approach with the local government.
- The other support structures include a **collaborative approach between the hospital, EMS provider and insurance company** as transport with an out-of-network provider would put too much burden on the patient in the form of balance billing (the difference between the billed and reimbursed amount). Globally, operators are putting effort into developing in-network health insurance agreements to reduce balance billing. Apart from forming a viable in-network structure, operators are also trying to offer specific discounts to increase utilization.

As defined earlier, the nature of operation is mainly time-sensitive medical emergencies and non-scheduled flights, thereby increasing the need for structured safety regulations (such as expediting the process for operational clearance, fleet choice, innovative technologies to support 24/7 onsite support, etc.), infrastructure investment (like landing zones for both helicopter and fixed-wing aircraft) and trained medical practitioners for EMS operations.

EMERGENCY MEDICAL SERVICES (EMS)

KEY OBSERVATIONS

INDIA VIEW:

Although EMS is an immediate need in India, prior attempts made by few players failed mainly due to the unavailability of a robust insurance policy that covers air transport and no clarity on subsidies or reimbursements from the state and central government.

However, the government has recently been taking specific steps towards building a sustainable ecosystem for EMS operations.

POTENTIAL CREATION OF AN INSURANCE SCHEME COVERING AIR AMBULANCE

In a positive step, efforts have been seen to dovetail air ambulance service into the Ayushman Bharat insurance scheme through the “Rasta Apatti Kawach” policy.

EFFORTS ON AIR SPACE DEREGULATION

India is making conscious efforts toward partial airspace deregulation and, in 2016, proposed a policy that would allow helicopters to fly point-to-point without prior air traffic control (ATC) clearance in airspace below 5,000 feet.

- The 2016 the Director General of Civil Aviation intends to initially carry out HEMS at surveyed landing sites and zones within the existing flight plan clearance system. The focus would first be on setting up a mechanism that paves the way for an accelerated flight planning and, in the next stage, permission for landing at the accident/incident site.

REMOTE AIR CONNECTIVITY

OVERVIEW

The socio-economic development of highly remote areas is in many cases limited due to the lack of connectivity. Despite variations in geographical positioning (e.g. island, difficult terrain, climatic barrier, dense forest) and population density, these regions face similar challenges.

CHALLENGES IMPEDING REMOTE REGIONS[35]

LACK OF PHYSICAL INFRASTRUCTURE

The geographical position of a region can restrict its access to necessary facilities such as hospitals, schools, and the post.

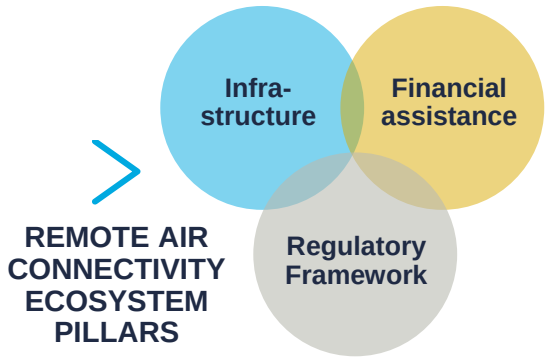
LIMITED ECONOMIC OPPORTUNITIES

Despite the tremendous potential for the tourism sector, natural resources and seasonal perishable goods, these regions lack informal economic activity.

GOVERNANCE CHALLENGES

Low population density can lead to an inadequate tax base, thereby increasing dependency on external aid for financial assistance.

An improved transportation system (rail, road, and air network) is instrumental to the upliftment of remote regions. However, the development of rail and road networks remains challenging in areas with islands, steep mountains, swampy lowlands and heavy seasonal rainfall. For some regions, these networks remain economically unviable due to time factors and utilization. Therefore, a **remote air connectivity ecosystem** can help to reduce travel time, increase access to basic amenities (e.g. education and healthcare), promote job creation, address the social and economic concerns and enhance financial stability.



FINANCIAL ASSISTANCE/FINANCING MODEL [36, 37, 38, 39]

Scheduled air services to remote routes are sometimes not profitable for operators as social upliftment is the critical target focus for such missions. Therefore, **governments across countries have been working on laying down various direct and indirect subsidies and grants to attract both operators and passengers**.

AIR CONNECTIVITY FINANCING MODEL

- **GRANTS:** Many countries through their NGOs and associations fund selective programs to support the growth of sectors like tourism and cargo.
- **SUBSIDY FRAMEWORK:** Direct subsidies are provided in the form of tax relief (VAT and customs duties), guaranteed fixed payments for specific routes, fuel subsidies and per-seat payouts. Indirect support is mainly offered to communities.

GRANTS

- **NEPAL** – Great Himalaya Trail (GHT) has partnered with airlines to increase access to tourists to hills and mountains of Nepal. A grant from UK Aid is helping in supporting GHT's interest in tourism development for Samarth-Nepal Market Development Programme.
- **JAPAN** – In the light of 2017's new Act on National Border Remote Islands, the central government introduced a grant to:
  1. Cover 50-60% of the local government's expenditures to support reduced seafares and airfares.
  2. Give cost relief for the transportation of agricultural products.
  3. Promote job creation and tourism.

REMOTE AIR CONNECTIVITY

DIRECT SUBSIDIES (MAINLY OFFERED TO OPERATORS)

In the bidding process for remote routes, compensation is provided to operators in the form of:

- **Grant of route(s) other than pioneer routes to support an airline's revenue**
- **Operational cost support** – Subsidies are generally provided between 30-40% on total costs.[38]
  - An operator in Indonesia, for example, received US$70 per person from the government as operating aid on a pioneer route, leaving only a US$20 cost for the passenger. The original price was US$90 per person for this route.[39]
- **Eligibility for participating in subsidy bidding process** – According to the Head of Public Communications in the Ministry of Transportation Indonesia, airlines must have a minimum of five owned aircraft and five leased aircraft per law to qualify for the subsidy grant program. The funds are distributed to a successful operator/airline over a three-year period.[41]
- **Vacant seat buyout support** – The central government pays a fixed amount to the operator for each empty seat to rural communities.
  - In another example, the United States federal government paid ~US$200 million annually to subsidize twice-daily service to 175 rural airports (Ely, Nevada; Lewistown, Montana; and Paducah, Kentucky).[40]

Local governments play a vital role in providing subsidies to the operators with minimal or no intervention from the central government. Also, local governments are in a better position to determine and evaluate pioneer routes without any approval from the central government.

- **Fuel subsidy for STOL routes** – Fuel prices and surcharges are usually modified to accommodate for short take-off and landing (STOL) routes. For example, in markets like Nepal, the price reduction has been based on the criticality of each route.
- **Per-passenger fixed amount, mainly provided by the government to support regional tourism** – For example, Israel offers a subsidy of 45 Euros per passenger to airlines that operate direct flights to Ovda Airport, a military airbase and civilian airport in the remote Ovda region of southern Israel.[42]
- **Enroute charges payment scheme** – In Australia, air operators providing aeromedical services to regional and remote locations can initiate reimbursement claim to Airservices Australia.[43]

INDIRECT SUBSIDIES (MAINLY OFFERED TO COMMUNITIES)

Discounting passenger airfare

- In Spain, communities situated near islands receive close to 50% discount on the cost of a regular ticket on flights to and from their places of residence.[44]
- **Local fare scheme in Queensland, Australia (Department of Transport and Main Roads):** Residents receive a discount up to ~US$400 for return ticket when traveling on specified routes like Cape York, Gulf of Carpentaria and Torres Strait. However, these discounts are only available to the passenger if they can meet specific criteria, such as including return airfare or currently living or having lived in a local fare scheme region for the last 3 years.[45]

REMOTE AIR CONNECTIVITY

REGULATORY FRAMEWORK TO SUPPORT REMOTE CONNECTIVITY

FIXED FLYING MANDATE – Some governments have mandated airlines to accommodate fixed flying hours to remote regions.

- As an example, the Civil Aviation Authority of Nepal (CAAN) created a mandate for airlines to operate 40% flights in remote sectors, 30% in tourism sectors and the rest in other areas to ensure adequate connectivity to remote regions[46]. Private airlines pay a penalty if they are unable to meet the government-assigned mandate.

DEFINED AIR FARE STRUCTURE – Government/aviation authorities have defined and set the airfare for remote routes (upper limit defined, maximum average fares, fare as per distance or routes).

- In Norway and Scotland, the maximum public service obligation (PSO) fare level on the different routes is often set by the authorities as a part of the tender requirements.[47]
- In Nepal, passenger service charge depends on the route served by the operator – TARA Air charges 10 to 200 NPR based on criticality or geographical positioning of the routes.

VAT AND CUSTOMS DUTY RELIEF – A subsidy aimed at supporting operators for better fleet management and reduce operational costs.

- Markets like Indonesia are providing VAT relief for fleet acquisition and leasing.[48]
- The import of spare parts can receive a waiver in VAT in markets like Nepal (13%), coupled with a huge reduction in custom tax for spare parts (30% to 1%).[49]

Subsidy elimination based on runway extension, passenger growth and other infrastructure development.

- Essential Air Service (EAS) has limited the scope of subsidy program mainly by eliminating the subsidy for routes which are reachable to a major airport with specified driving distance or other modes of transportation. The specified driving distance as per EAS scheme is 45 minutes more than the air route.[40]
- In Indonesia, the government is planning to move subsidies from passenger routes which are developed or connected with the primary hub to a cargo route by 2021.[50]

REMOTE AIR CONNECTIVITY BENEFIT

UNITED STATES

~160 communities have benefited from un-economic routes as per Air Transport Action Group. **0.12% surge seen in per capita income in communities**, driven by a **1% increase in air traffic.**[51]

INDONESIA AND BRAZIL

With **10%** increase in airport connectivity, emerging regions such as Indonesia and Brazil has seen **~5%** surge in foreign direct investment, leading to more employment opportunities and regional development.

AUSTRALIA

Remote Air Services Subsidy (RASS) in Australia supported over 372 communities (266 direct routes and 106 routes connected via RASS port) by initiating regular weekly air transport for passenger and goods (educational materials, medicines, fresh foods, etc.) as per Senate Standing Committee.[52]

REMOTE AIR CONNECTIVITY

INFRASTRUCTURE

GOVERNMENT INVESTMENT [53]

Focus on development of airport infrastructure and creation of a sufficient pool of skilled labor to support effective utilization.

According to Asian Sky Group report, countries such as China are planning to invest US$21.5 billion to build GA airports during 2017-2020.

REGIONAL HUB EFFECTIVE UTILIZATION

Focus on development of regional hubs or on better leveraging developed regional hubs.

Increase passenger turnover for mainline flights by linking remote routes with regional/sub-regional hubs. This can be achieved via code share agreement, seat purchase agreement or interline agreement.

KEY OBSERVATIONS

High operating costs or limited passenger traffic generally restricts operators from serving remote routes. As a tactical measure, many countries focused on creating a remote air connectivity ecosystem (RACE) for the upliftment of remote communities in terms of social and economic status. The aim is also to ensure that operators can sustain and manage their costs effectively.

REMOTE AIR CONNECTIVITY ECOSYSTEM (RACE) AT THE GLOBAL LEVEL

Globally recognized remote connectivity programs such as Essential Air Service (EAS) in United States, Remote Air Services Subsidy (RASS) and Remote Airstrip Upgrade in Australia, Pioneer Air Transportation in Indonesia and Public Service Obligations in Europe all focus on three key elements: **financial assistance, regulatory liberalization** and **infrastructure** in order to form an ecosystem to serve remote communities.

FINANCIAL ASSISTANCE PLAYS A PIVOTAL ROLE IN ATTRACTING OPERATORS FOR REMOTE REGION CONNECTIVITY PROGRAMS.

- Support is provided in the form of grants for investment or loss coverage and subsidy distribution contract for a three-five year period which includes seat buyout, operating aid and revenue generation route in return, per passenger fixed amount.
- Assistance is also community-based – direct discounting based on specific criteria (return travel, stay time in the region).

REMOTE AIR CONNECTIVITY

KEY OBSERVATIONS

Apart from financial assistance, regulatory and infrastructure measures have also led to operational ease in a remote area for many countries.

- **Tax benefits** such as fuel subsidies (price or surcharge reduction) and VAT and customs duty relief for fleet acquisition, leasing, and import of spare parts and reduction in landing and parking fees.
- **Regulatory liberalization to boost supply:**
  - Reduction in aircraft requirement for a company establishment (leased or owned).
  - Simplification in procedures to obtain operator permit.
- Mandatory deployment of a certain percentage of flights to remote regions to maintain adequate connectivity.
- Adequate airport infrastructure and parking slots allocation at major hubs for small aircraft (i.e., one and three frequency rules, reserved parking slots, priority access to remote route flight for parking) have simplified remote route operation.

REMOTE AIR CONNECTIVITY ECOSYSTEM (RACE) IN INDIA

Similar to the global initiatives, the Indian government has drafted a plan to offer various aids through the regional connectivity scheme (RCS), also known as UDAN.

- Subsidy or viability gap funding (VGF) is provided in return of seats offered by fixed-wing (min. 9 or max. 40 RCS seats) and helicopter (up to 13 RCS seats) operators at cheaper rates. VGF eligibility is based on the number of RCS flights per week – minimum three and maximum 14 from the same RCS airport and three years.
- Airfares are capped at Rs.2,500/hr. (500km) flight for fixed-wing and 30 mins. for helicopter
- Similar to the global framework, local and state governments in India play an essential role in RACE. State governments are to provide 20% of VGF for states other than the North-East States, where the ratio will be 10%.
- Apart from the airports' development plan, the government announced the addition of 275 parking bays to ease congestion at airports in 2018.

In spite of all of these initiatives, the success rate of the first two phases of RCS routes has been less than 20%. This is mainly due to the operational, technical, procedural and financial problems in the scheme. The small operator group still feels the pressure of hiring talent from abroad, importing spare parts and parking and handling charges at airports, coupled with stringent safety regulations.

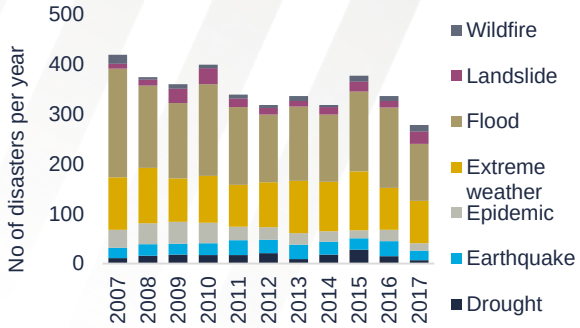
DISASTER MANAGEMENT

OVERVIEW

As much as natural disasters are inevitable, it is essential to face them efficiently and limit the damages when they do occur. According to a UN report, over a decade, 700,000 lives have been lost and 1.4 million people have been injured which resulted in US$1.3 trillion economic loss. [54]

These disasters initially impact the ground infrastructure, thereby making air transport the only connection to these regions and in providing support in the form of food and medicine, search and rescue and firefighting.

GLOBAL REPORTED NATURAL DISASTER



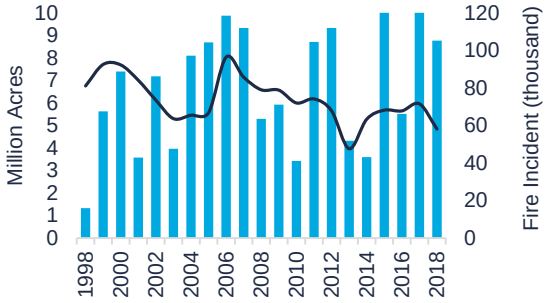
Source (s): OFDA/CRED International Disaster Database

GENERAL AVIATION PENETRATION IN FIREFIGHTING

In countries like the United States wildfires are increasing, leading to damages at a mass scale. According to the US National Climate Assessment, the change in climate has extended the fire season from six months to the full year in western countries, thereby increasing demand for specialized equipment (aircraft) to control the wildfires.[55] Firefighting aircraft are used as water scoopers, flame retardant dispersal systems, resource management and aerial supervision. While fixed-wing aircraft and helicopters are used to carry out these missions, helicopters are gaining prominence due to their versatility and performance (superior mobility, speed and hovering capability compared to fixed-wing aircraft) and the ability to cater to a wide range of applications (aerial reconnaissance, equipment and asset delivery and medevac missions).

WILDFIRE AFFECTED AREA IS EXPECTED TO INCREASE TWO TO SIX TIMES BY 2050 IN WESTERN COUNTRIES

UNITED STATES TOTAL FIRE INCIDENTS



Source (s): National Interagency Fire Center

FIREFIGHTING AIRCRAFT AND ENHANCEMENTS

FIXED-WING AIRCRAFT:

Single engine air tanker (SEAT): the Air Tractor AT802F is capable of delivering up to 800 gallons of fire retardant or water and is predominantly used in areas which limit the usage of large air tankers.
Water scoopers: according to Viking Air, about 111 amphibian firefighting aircraft (25 CL-215T and 86 CL-415) are currently in service and capable of accumulating 1,600 gallons of water in 12 seconds.[56]
Other fixed-wing aircraft such as the King Air 200 and King Air 90 are used to support aerial supervision – coordinating, directing and evaluating air tanker operations.

HELICOPTERS[57]:

***Bambi bucket:** depending on the size and power of the helicopter used, hundreds or even thousands of liters of water can be dropped on each pass through a suspended bucket. Helicopters like H120 and Bell 412 are widely used.*
***Fire attack kit:** the fire attack kit is a rigid, external tank, fixed under the helicopter. It has a pumping hose which allows it to fetch water from small reservoirs and shallow streams.*

DISASTER MANAGEMENT

PREVALENT OPERATING MODELS IN FIREFIGHTING [58, 59, 60]

There are two primary agreements: owned or leased firefighting aircraft and contracts with operators.

Since wildfires can be rampant and spread quickly, maximum aircraft deployment in quick times is essential. Contracts are typically structured to cater and act as “exclusive use contracts” and “call when needed” contracts.

EXCLUSIVE USE

- It is a “retainer model,” usually paid for 120-150 days period from late spring to late fall on a per-aircraft basis and can go up to one full year. The payment to the operator is assured irrespective of aircraft deployment.
- The contract requires the aircraft to be made available for the government during the fire season while simultaneously providing a guaranteed revenue stream for the operators.

CALL WHEN NEEDED

- In this model, companies are paid only on a per-incident basis and are generally valid for five years.
- The government pays a premium to avail of this service by the operators.
- The operator can choose to turn down a request in this model, unlike the exclusive contracts where the immediate deployment of firefighting aircraft is compulsory when requested.
- Unavailability during a need is a real possibility as the aircraft might be deployed for some other operation since exclusive contract obligations do not bind it.

OWNERSHIP/LEASING

- Apart from the contracting model, governments of the state, country or region also use their fleet to combat wildfires.
- Governmental bodies such as the fire department (County of Hawaii Fire Department) and forest service (USDA Forest Service Fire & Aviation; South Korean Forestry Aviation Office), among others, have adopted this model.

FIREFIGHTING – KEY GLOBAL PARTNERSHIPS

Several global partnerships, bi-lateral agreements between countries are on the rise to effectively fight the wildfires.

European Union (EU) has allocated a fleet of aircraft as ‘rescEU,’ to tackle the forest fires.

- The fleet under rescEU[61, 62] is mobilized, whenever a country requests via the European Civil Protection Mechanism.
- At the end of 2019 rescEU had a fleet of seven fixed-wing aircraft and six helicopters pooled from various countries and plans to enhance the fleet by allocating up to 200 million Euros per year through 2025.
- Asset financing: EU is co-financing rescEU assets for member states at 75% of operational costs when used inside the EU (or a participating state) and 75% of transport costs for deployment outside the EU.

“Resource sharing” agreement between Australia, New Zealand, and the United States.[63]

- The three countries signed a wildland fire management agreement to facilitate a request-based resource sharing model on a national level in 2017.
- The countries share a standard system called the Incident Command System (ICS) along with similar training regimens, hence there is ease of deployment whenever needed.

DISASTER MANAGEMENT

SEARCH AND RESCUE (SAR)

Traditionally, countries have been entirely dependent on their respective coast guard/military for SAR operations. Deploying the resources needed for SAR operations is dependent on the availability of an aircraft, and at times the swift response to any disaster situation can be delayed due to other obligations. As a result, governments across the globe are now working to enroll the services of private operators through contracts.

OPERATING / FINANCING MODEL FOR SAR [64, 65, 66, 67, 68, 69]

To cater to search and rescue needs, governments across the world adopt various models ranging from partial funding of the program to full outsourcing.

FULLY OUTSOURCED

- Search and rescue operations are commonly fully outsourced to private players for a specific period to cover for a particular region, program or specific governmental entities like the coast guard or navy.
- The number of aircraft and bases to be deployed are identified, and the contract is awarded to the operator accordingly.
- Countries are slowly moving towards outsourcing SAR responsibilities to private players. The UK in a phased manner has outsourced to individual players the SAR responsibilities of the coast guard from the Royal Air Force and the Royal Navy. According to Helicopter Investor, UK saw a 20% reduction in response times and availability of aircraft was 98% after the contract deployments.

GOVERNMENT FUNDED + DONATIONS

- In this model, typically about a third of the operating cost is borne by the government while the other two thirds are secured through donations like sponsorships, volunteer, support group activities, events and partnerships with communities, among others (according to Surf Life Saving Australia report).[66]
- Generally the operators are contracted from local governmental bodies and are funded by them. The operator then raises funds through its own channels. The model works as a not-for-profit engagement.
- The model is prevalent in places like Australia and Washington County in the US, among others.

OWNED SQUADRONS + CONTRACTS

- Many countries maintain their own squadrons of aircraft for SAR needs or deploy the militaries during needs.
- Some countries like Norway additionally have contracts for any contingencies. In Norway, the rescue service uses helicopters and rescue vessels from the offshore industry whenever possible and needed.

SAR – KEY STATS

- **United Kingdom [70]:** According to UK Department for Transport report, from April 2018 to March 2019, the civilian helicopter rescues in the UK were 2,438. 1,606 people were rescued and 182 assisted from all the taskings.
- **Emergence of new roles [71]:** Rise in private SAR deployments in the oil and gas (O&G) industry as the drilling continues to further from the shores that are no longer covered by national emergency services.
- **Operational flexibility:** Dedicated SAR helicopter or reconfigurable ones are used. The operator can make a return by leasing its services to governments when required.

DISASTER MANAGEMENT

HUMANITARIAN AIR SERVICES

Whenever a country encounters disaster like situation, it might not have enough resources to handle it alone. To assist all the countries in such circumstances, multiple international organizations like the United Nations Humanitarian Air Services (UNHAS) and the ECHO Air Service by the European Union has been established that carry out humanitarian air services.

UNITED NATIONS HUMANITARIAN AIR SERVICE (UNHAS) [72, 73, 74, 75]

The UNHAS is managed by the World Food Program (WFP) of the United Nations. On average, UNHAS transports about 32,000 people and 300 metric tonnes of light cargo per month and takes part in many life-saving missions globally.

- UNHAS serves non-governmental organizations (NGOs), United Nations agencies, donor organizations, diplomatic missions.
- UNHAS has strategically located hubs for the storage of medical kits, shelter gear, ready-to-use foods and logistics equipment in Italy, Ghana, Malaysia, Panama, Spain and Dubai.
- The WFP has 100 registered air operators currently across the globe to carry out operations.
- UNHAS currently has a fleet of 63 aircraft that includes Dornier 228, DHC-8, Bell 212, Bell 412 and Mi-8, among others.

PRE-REQUISITES FOR OBTAINING UNHAS AIR OPERATOR CONTRACTS [76, 77]

- WFP contracts aircraft from operators holding air operator certificates (AOCs) are pre-evaluated by the WFP Aviation Safety Unit and meet ICAO standards. The aircraft are managed by the UNHAS.
- The operator must have operational and maintenance control over the aircraft offered.
- All helicopters must have an Enhanced Ground Proximity Warning System (EGPWS).
- The operator must have conducted international air transport operations in field service for at least 24 continuous months prior to their application for registration with the United Nations.
- No aircraft offered should be older than 20 years of age.

UNHAS offers three type of contracts to the operators: long-term charter agreements, short-term charter agreements and stand-by aircraft agreements.[76]

UNHAS CONTRACT TYPES

- Long-Term Aircraft Charter Agreements (LTAC)
  - The contracted company must have active-compliant aircraft-tracking unit that transmits real-time flight data to the UN's satellite network.
- Short-Term Aircraft Charter Agreements (STAC)
- Stand-by Aircraft Charter Agreements (SACA)
  - To cater to surge requests during emergencies.

DISASTER MANAGEMENT

ECHO FLIGHT SERVICE [73, 78, 79]

The European Union (EU) has established its own humanitarian air services called the ECHO which operates in Africa.

Fleet profile:

- ECHO has a fleet of 6 aircraft; 2 Dash 8 100 and 4 are Cessna Grand Caravan EX.
- 3 flights are operated in the Democratic Republic of Condo, 2 in Mali and 1 in Kenya.

Scope of operations:

- ECHO funds UNHAS for its operations in other African locations and for one of its helicopters.
- EU finances ad-hoc flights to support humanitarian operations during emergencies and funds for the operations of a helicopter operated by UNHAS.
- Separately, through the EU civil protection mechanism, the EU has, in recent years, supplied relief items and medical supplies to people in need in Bangladesh, Nepal, Myanmar and Chile, among others.

DISASTER MANAGEMENT

KEY OBSERVATIONS

Disasters are mostly unpredictable and quick response to counter them is paramount. Most of the western countries specifically are bolstering their firefighting and search and rescue infrastructure to effectively tackle disaster situations, which was earlier the job of the military of a nation.

GLOBAL PERSPECTIVE:

Many European nations, the US and Australia (where many forest fires occur) have a dedicated fleet for firefighting and are reinforcing their resources and support system through cooperation agreements. Private SAR deployments are on the rise, too.

HUMANITARIAN AIR SERVICES:

Apart from the efforts of various countries on an individual basis and through multi-country cooperations to combat disasters, international organizations like the UNHAS and EU with its ECHO flight service are providing the humanitarian air services for the countries in need.

The World Food Program (WFP) contracts aircraft from operators while the UNHAS manages the aircraft and deploys them during disaster situations primarily in Asia and Africa. The operators tying up with UNHAS must have air operator certificates (AOCs) that are pre-evaluated by the WFP Aviation Safety Unit and meet ICAO standards. ECHO maintains its own fleet of aircraft that are strategically stationed in Africa.

SEARCH AND RESCUE: Deployment of private SAR contracts is on the rise, indicating a positive outlook.

Contract outsourcing on the rise: To quickly respond to situations and ensure the availability of aircraft at all times, many countries are outsourcing the SAR contracts to private operators.

- **Fully outsourced contracts** are widely seen in countries like the UK, Ireland and Australia, among others, while a few countries like Norway maintain their own squadrons and, as a safety net, also have additional private contracts to cater to disaster management.

Countries are witnessing quicker response times and better availability of the SAR aircraft as a result of having dedicated SAR providers.[70]

- **Restrictive contracts are either "exclusive" or "inclusive"** – coverage for specific government entities like the coast guard (the UK) are exclusive, while others are more inclusive in nature, where the operators on contract provide coverage for the entire geography of the country.
- **Independent SAR contracts** in the oil and gas industry are growing, as national emergency services often do not cover areas of operation outside borders of the country like deep-sea.

FIREFIGHTING: With the fire seasons growing longer and effectively lasting the whole year, countries are stepping up ways to counter the fires.

Multi-national agreements, reinforcement of firefighting resources and an increasing number of contracts are steeply on the rise to effectively combat the wildfires.

DISASTER MANAGEMENT

KEY OBSERVATIONS

FIREFIGHTING:

Increasing contracts outreach: Focus is on contracting a greater number of players to combat forest fires from countries all over the world either on “exclusive use” or “call when needed” agreements.

- In such contracts, governments either own or lease fleet and can choose to have a contract for operations.
- Firefighting is seen as a global effort with multi-national cooperation agreements like the European Union rescEU that manages a fleet of firefighting aircraft. At the same time a reserve fund caters to the operations or bi-lateral or tri-partite cooperation agreements like the Australia, New Zealand and US agreement to share firefighters on an as-needed basis.

India View: Traditionally, India has been reliant on the military to step in for disaster relief activities.

- India created a National Disaster Management Plan (NDMP 80) in 2016 to make the country become more disaster resilient and achieve substantial disaster risk reduction.
- The plan ensures that all phases of disaster management — preparedness, mitigation, response, and recovery — are covered by horizontal and vertical integration among all agencies and departments of the government.
- The NDMA seeks to improve the plan periodically by keeping up with the knowledge base and global practices in disaster management.

The plan is yet to see full-scale deployment and still in the process of identifying requirements of resources such as helicopters, aircraft for evacuation during natural disasters.

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