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Humanitarian Aid

**Humanitarian Aid for Amputees in Banteay Meanchey, Cambodia**

As human beings, we are accustomed to commuting to work or school by walking or using various forms of transportation. We walk, run, eat, drink, etc., performing these activities comfortably. What if, while walking near our home one day, we were seriously injured by an anti-personnel landmine, a device that nearly caused our death? How would we deal with that situation? This device is designed to kill or incapacitate people who step on it, set it off, or handle it by sensing pressure (Harris, 2024). Well, this is the situation of many people in Cambodia, which has a current population of 17,121,847, representing an increase of 1.04% from 2023 (Macrotrends, 2024). The country has the highest number of landmines in the world. The inhabitants continue to suffer the consequences of past wars. The main types of injuries are caused by the shockwave generated by the explosion, which can shatter the foot, leg, and/or any part of the body, especially the limbs, leading to traumatic amputations (International Committee of the Red Cross [ICRC], 1996).

There are different types of anti-personnel mine effects in addition to explosives. Fragmentation mines, for example, work by projecting shrapnel into the mine, which, like explosive mines, kill or injure more people simultaneously. The same happens with directed fragmentation mines, which have a much larger radius because they spread across areas. There are also jumping mines, which, as their name mentions, jump one or two meters upwards before exploding, causing worse damage (Domingo & San Martín, 1997). That is why I focus on explosive and fragmentation mines—although they are lethal, most survivors have been affected by these types. In addition, they are very effective as they are undetectable with better sensors and anti-deactivation devices (Domingo & San Martín, 1997).

Anti-personnel mines can be active for up to 50 years or more after their emplacement, they started to be used in Cambodia in 1975 with the Khmer Rouge regime. Although it ended in 1979, these weapons continued to be used in conflicts with different Cambodian factions that lasted more than ten years (ICRC, 1996). This means that there could still be many active mines, at least until 2040.

The failure rate in the self-destruction of mines is variable; according to different sources, it is up to 10% to 25% (Domingo & San Martín, 1997), which can lead us to an approximation of 75% to 90% effectiveness in the activation of mines.

Cambodia has many provinces with too many mines. As of September 2021, there were still more than 2 million unexploded mines registered throughout the country (Ramponi, 2021). One of the most affected provinces, and on which we will focus specifically on, is Banteay Meanchey, whose capital is Sisophon, located in a corner of Cambodia and adjacent to Thailand (International Journal of Environmental and Rural Development [IJERD], 2012).

Only in 2022, there was a register of a total of 541,139 mines. And the total amount of areas identified or suspected of having anti-personnel mines from 2009 to 2022 in Banteay Meanchey is of 103,581,047 (The Kingdom of Cambodia, 2024).

As a strategy of the United Nations, it is extremely important to see what actions can be taken to exterminate as many mines as possible and to create strategies to prevent accidents with more horrible consequences. But what does it say about the people who have already been affected? As one of the subtitles explains, it is essential to do much more to support direct and indirect victims in their basic needs, such as: money for their medical check-ups, medical treatments, psychological assistance (if necessary), increased financial support for living expenses, as well as more targeted assistance.



Image 1. Ramponi, A. (2021). *Minas antipersonas: herencia camboyana*. Purgante. https://revistapurgante.com/minas-antipersonas-herencia-camboyana/#:~:text=Este%20confli cto%2C%20encabezado%20por%20los,de%20minas%20siguen%20sin%20explotar

In addition, an important factor which is equally affected is the environment because of the increase in contamination by explosions. As this same text states, trees, plants, vegetation, insects, etc., near the mines are not spared either from these shock waves or the fragments fired (Domingo & San Martín, 1997). Considering the common components of explosives, such as ammonium nitrate, sawdust, and aluminum powder (Sarmiento, 2013), they also impact the air, soil, and other environmental factors.

Agriculture is a really important sector of the economy, but much of the land has to be abandoned as it cannot be cultivated because of the mines. This affects much more because the mines were mostly laid in minefields, not in isolation. They are usually made up of anti-personnel, fragmentation, and anti-strike mines, or various pieces of metal or other objects that have been laid to simulate the danger. This prevents the occupation of a good amount of land in the area (Domingo & San Martín, 1997). The last number of minefields counted in Banteay Meanchey was in 1995, with 438 mines (ICRC, 1996). The sector is

important, as agricultural products and livestock are essential for the income of many families in the province. Only in 2022, Cambodia had $20.16 billion in exports (Macrotrends, 2024).

In Banteay Meanchey, the agro-industrial crops cultivated in 2022 were : 3,589 hectares of land dedicated to cashew nut production, with a yield of 7,463 tons; cassava with 102,955 ha and 1,943,975 tons; red corn with 13,671 ha and 114,274 tons; sugar cane with 501 ha and 11,112 tons; soybeans with 72 ha and 250 tons; mung beans with 165 ha and 227 tons; sesame seed with 44 ha and 41 tons; and peanuts with 39 ha and 68 tons. Likewise, mango, longan, and rice production have explicitly great agro-processing potentials, especially rice, which is highly dependent on the food diet of the area (Invest in Banteay Meanchey, 2022). In terms of livestock, animals such as cattle, buffalo, pigs, and poultry are important (IJERD, 2012).

Climate change has strong negative impacts on agriculture. In Banteay Meanchey, agriculture will be affected by the increase in temperature. As a consequence, cereals will suffer a negative impact, especially rice, corn, and soybeans. In Cambodia, especially in the extreme northwest, more than 80% of household income comes from agricultural production, which would be affected by and suffer losses in agricultural yield and can reach up to 60% crop yield loss (International Journal of Agricultural Technology [IJAT], 2020).

Speaking of growers and the great contributions they bring to the country's economy, studies published in the International Journal of Agricultural Technology (2020) show that approximately 55% of the growers had elementary schooling, another 3% had secondary schooling, and almost 20% were illiterate. Additionally, 90.7% of rice farmers were married, while less than 10% were single, widowed, or divorced (IJAT, 2020). The updated minimum wage in Cambodia as of January 1, 2024, is: for a trainee worker, $198.00 to $202.00 per month; and for a regular worker, from $200.00 to $204.00 per month (WageIndicator Foundation, 2024). In Banteay Meanchey, the percentage of poor households with an IWI value under 70 in 2022 was 46.8% (Global Data Lab, 2022).

In addition to agriculture, in Banteay Meanchey, tourism and handicrafts are important to the economy (IJAT, 2020). Within the province , there is a commune called Banteay Chhmar, an important tourist destination within the area because of its history and heritage. The location attracts tourists, bringing a 12% contribution to the local revenue (IJERD, 2011). In tourism, Cambodia had 5.312 billion in 2019, a 9.93% increase from the previous year (Macrotrends, 2024).

On the medical part, it is a bit complicated to obtain absolutely everything necessary outside hospitals or private clinics. For example, the United States offered the province treatments for general diseases, dental issues and eye diseases by giving free glasses, offering consultations, examinations, and even surgeries (Bunthoeurn, 2023). This talks about the need that exists in the area. The costs of medical expenses are also increasing, especially taking into account medical expenses and treatments in addition to prostheses, which in the case of children have

to be changed every six months due to their constant growth, and in the case of adults, from three to five years (Domingo & San Martín, 1997).

As we can see, the situation in the province is quite challenging because of the lack of economic opportunities, that would make it difficult to live in the area due to the presence of mines. That is why it is proposed to increase the quality of life of the amputees by giving them special prostheses with the technology of Dr. Karthikeyan Kandan, a professor in mechanical engineering at De Montfort University of Leicester. In 2020, he created a prosthetic socket using recycled plastic bottles for amputee patients (The Montfort University Leicester, 2021). Using the shredded plastic, he transformed it into granules for polyester production. By heating these granules, he created a lightweight, solid material suitable for molding the prosthesis (Plastics Technology Mexico, 2019).



Image 2. Pet planet. *Researchers turn bottles into prosthetic limbs.* Pet planet. https://petpla.net/2019/09/04/researchers-turn-bottles-into-prosthetic-limbs/

This prosthesis not only helps the environment by being recycled, but also because of the production price which is £10 when it normally costs £5,000 (De Montfort University Leicester, 2021). Dr. Kandan remarked that numerous individuals in developing nations could greatly improve their quality of life with high-grade prosthetic limbs. Regrettably, they lack the financial means, so their project's objective has been to pinpoint cost-effective materials to help these individuals, and they have successfully achieved that goal.

Dr. Kandan has tested his invention with people. He fabricated the socket at DMU and subsequently traveled to India to test it on two individuals: one with an above-knee amputation and one with a below-knee amputation.

Utilizing plastic bottles would significantly contribute to mitigating pollution in the nation, given that Cambodia's population expansion and economic progress have resulted in a surge

in waste accumulation. For example, in Phnom Penh in 2023, more than 3500 tons of municipal waste will be generated daily, of which 20% is plastic. The plastics sector is experiencing the fastest expansion among industrial sources of greenhouse gases, potentially accounting for 20% of oil use by 2050 (Climate Promise, 2023).

For the project, Dr. Kandan worked alongside the Bhagwan Mahaveer Viklang Sahavata Samiti, the Malaviya National Institute of Technology (MNIT) and universities including Strathclyde, Salford and Southampton. Funding for the project was secured from the Global Challenges Research Funding (GCRF) with additional support provided by the Academy of Medical Sciences (Plastics Technology México, 2019).

The GCRF could be a great choice as a sponsor of the project, as it supports research to assist developing countries and the world with sustainable development and to promote it, as well as to offer these opportunities (UK Research and Innovation, 2024).

Another option is the BMVSS Jaipurfoot. They help disabled people without limbs through the use of technologically advanced prostheses free of charge, regardless of the region they come from. They have helped people all over India and other places around the world (BMVSS Jaipurfoot, 2024).

Most of the victims in Cambodia are children, because of their short stature and unconsciousness, they are not able to identify the risk of the artifacts, as at that young age they play a lot and are eager to explore their environment (Domingo & San Martin, 1997). This is why another possible sponsor is the Cambodian Children's Fund (CCF). The objective of this foundation is to support children and their families living in Cambodia in very difficult situations with support programs and attention to basic needs, one of which is the medical clinic (Cambodian Children's Fund, 2024).

Heidi Kühn, founder and executive director of Roots of Peace, is also engaged in clearing bombs and landmines in several countries, including Cambodia, supporting more than one million farmers and their families by returning land to agricultural use. “Mines to Vines” is an incredible project that supports the economy and exports, which is why we can also have a consultancy and even an agreement with Roots of Peace (Roots of Peace, 2024).

With these three sponsors, consultancies and, of course, the technology of Dr. Karthikeyan Kandan and the universities that accompany him in this incredible project, it would be possible to create and finance the necessary prostheses in Banteay Meanchey. In addition, the Neak Tep Hospital is a hospital with a branch in Banteay Meanchey province that could be perfect to attend to victims as it has 24-hour service and advanced medical equipment able to be used in case of an emergency. This hospital offers health packages for companies, offering special rates, customized packages and medical check-ups for groups of employees, individuals or beneficiaries. With this type of services, we could create an agreement with our sponsors to pay for the hospital's services to fit the prosthesis and be an intermediary to receive the injured and request the prosthesis they need (Neak Tep Hospital, 2024).

This situation is urgent to address, as millions of people suffer the consequences of these terrible weapons, which put their lives at risk and completely ruin their quality of life. Anyone can be affected by encountering mines, resulting in amputations, burns, or even death. However, this problem is not limited to this province or country; it is also prevalent in various parts of the world, including countries like Iran, Mozambique, Angola, Afghanistan, and Egypt (Minesweepers, 2024).

The issue highlights the need to eliminate these mines, not only to improve the quality of life in rural areas—allowing them to be used for agriculture and plantations—but also to boost the economy. The lifestyle of farmers and their families would improve as they gain the security to move freely without the constant risk of losing their lives.

This project aims to support all victims who are suffering due to the emergency in Banteay Meanchey, which is why it falls under the category of "Humanitarian Aid" (Concern Worldwide US, 2023).

Addressing the primary need to eliminate mines to prevent further victims and avoid amputations, we should consider developing new plans for global mine removal. This could include analyzing the areas where mines are located and creating specialized robots to deactivate them, among others.

In addition to sponsors, universities mentioned earlier could participate in the project by providing services to amputees who need regular medical checkups. Large non - profit technology companies from the United States could also support the cause by analyzing the needs of the affected populations and providing financial aid. The project could gain more visibility through television or social media, encouraging donations or volunteer services from the public.

These are just a few suggestions; however, the primary forms of foreign assistance in this context include humanitarian aid for people in catastrophic situations and targeted aid projects where countries like the United States or an organization working as a sponsor assists with specific problems to help the nation develop (Tutor2u, 2023). Given the influence Americans have in supporting and promoting international issues through the media, it would be highly beneficial to raise awareness and develop action plans with other countries. Fortunately, the United States is a world power with the resources to sustain itself properly in various aspects and provide necessary medical treatments to those in need. Unfortunately, this is not the case for Cambodia, which still needs improvement in several areas, including the economic and technological ones. Additionally, the United States is known for being a supportive nation that listens and tries to help other countries in need, aiming to contribute to global development and wellness.

Imagine the great potential Cambodia would have in these areas and the help we would provide to those in real need around the world with these prostheses and medical services that would be greatly utilized and appreciated.

Let's give a little bit of help full of kindness to a noble cause towards our fellow humans.

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