technological solutions to alleviate poverty

- Nanotechnology

Nanotechnology plays an important role in reducing pollution and fighting drought (providing sources of water )through nanoparticles that :

1. nanofiltration membranes (a low-cost solution for access to drinking water and its production in poor rural areas around the world).

- Measuring the quality of water, air, soil

- Rapid detection of harmful germs in water sources and food products.

- Sending monitoring data to databases.

- Contribute to the treatment of pollutants and toxic waste by:

Pumping nanoparticles through the soil to reach the places of toxic waste to convert them into harmless substances(through special chemical reactions).

- Water treatment using iron nanomaterial.

- Selective adsorption on nanosorbents.

 - Environmental nanostimulation.

\_robots

\_ Trees will be planted (10 times faster than a human and at half the cost).

 It may help to survive drought (using artificial intelligence sensors and monitors; it can track the growth of plants to find out which species can withstand the harsh environment).

\_ Help harvest solar energy (developers are turning to robots to help sustainably collect and use energy across industries and environments.

A good example of this is the Wave Glider from Liquid Robotics . It looks like a skateboard and has built-in solar panels, collecting solar energy as it moves along the surface of the ocean. It uses the stored energy for propulsion and for recharging the batteries necessary for the sensors.

Wave Glider applications involve collecting high-resolution carbon dioxide samples in difficult locations to get a complete picture of global climate change).

\_Eats water pollution (poor areas suffer from water pollution and lack of potable water; a robot has been developed to help clean waterways, keep plants free of garbage and prevent animals from accidentally eating waste).

\_ Will make re-management easier (this will increase production efficiency and higher quality)

- Reduce carbon dioxide emissions and reduce pollution.

- digital devices

 Citizens around the world have more access to digital devices than ever before. In developing nations, excessive use of digital devices allows accurate data collection. This set of data provides opportunities to improve the health and food sector. For example, the Harvard School of Public Health has effectively explained why and how diseases are spread in Kenya. The researchers used statistics from digital devices to effectively determine the spread of diseases. In developing nations, digital devices can also help connect small farmers. For example, WeFarm is a free digital network that connects farmers in Kenya, Uganda and Tanzania. WeFarm uses artificial intelligence to connect farmers with similar questions and answers. It also encourages the exchange of information, innovations and solutions. Which led to an increase in profits, pricing and product quality. Esoko is also promoting agribusiness in African countries. Esoko is a web-based program that connects small farmers to large markets. Esoko sends SMS messages displaying price notifications, market opportunities and supply totals. Esoko's implementation has lowered the transaction cost of local farmers. It also increased advisory capacity and the income of small farmers. Therefore, digital devices are successful technological solutions that alleviate poverty.

- Online learning

 In addition, online learning is another technological solution that alleviates poverty in developing countries. Improving educational opportunities is essential to the inclusive growth of a nation. Unfortunately, certain areas of developing countries do not have access to personalized education services. Therefore, online learning bridges this gap. The African Virtual University (AVU) is a non-profit organization that offers higher education courses to citizens in Sub-Saharan Africa. AVU offers online courses from 50 universities. AVU's mission is to improve the quality of education, provide women with educational opportunities and stimulate economic growth. In 2011, 25,000 students from 17 African countries enrolled at AVU. AVU has succeeded in influencing African economies by producing citizens with degrees in business or technology.

 - Fog traps

 Fog catchers are used by people in areas with less rainfall. Fog catchers use a suitable net to catch water droplets. Then the droplets pass through the drain to the filters. The water captured by this equipment goes to farming, washing and other appliances. In Peru, a team from the non-profit organization Youthinkgreen trained local residents to build a fog catcher. Locals expect to save more than 50% of their daily water use.

 - Hydroelectricity

 One hydropower strategy is to implement a mixed-use dam. Dams increase water security while expanding water storage. Hydropower also provides communities with clean, cheap and consistent energy. In China's Hubei Province, four poor provinces have received hydropower development projects. The project's mission was to use technological solutions to alleviate poverty in these districts. The project funded different poverty agendas in each county. An evaluation of the project found that the potential of hydropower development for poverty alleviation was significant. The provincial income levels even exceeded the poverty line in China.

\_Artificial intelligence (to solve environmental problems)

\_Artificial intelligence is useful in agriculture

Predicting crop yields is not enough, though. Data provided by the World Bank show that 65 percent of working poor adults earn their living through agriculture

\* Technology companies are working to solve the global food crisis by improving the agricultural yield of various crops.

\* Sorghum is a valuable cereal crop in developing countries that can be grown more efficiently with the help of artificial intelligence.

\* Uses artificial intelligence and four-wheeled robots to drive through fields to measure everything from possible signs of disease to plant color, shape and size in order to give poor farmers the information they need.

\_AI has the potential to accelerate global efforts to protect the environment and conserve resources by detecting energy emission reductions, CO2 removal, helping develop greener transportation networks, monitoring deforestation, and predicting extreme weather conditions. Below mentioned are examples of how AI provides means to tackle the most pressing environmental challenges.

\_Use of machine learning to optimize energy generation and demand in real-time; better grid systems with increased predictability and increased efficiency, and use of renewable energy.

\_Smart sensors and meters can be deployed within buildings to collect data and monitoring, analyzing, and optimizing energy usage in buildings.

\_AI is already being used in smart transport eg: google maps and Waze, where Machine learning algorithms are used to optimize navigation; increase safety and provide information regarding traffic flows and congestion (e.g. Nexar).

Biodiversity and Conservation

\_Biodiversity and Conservation

When combined with satellite imagery, AI can detect changes in land use, vegetation, forest cover, and the fallout of natural disasters.

Invasive species can be monitored, identified and tracked using the technology above, identifying and tracking their presence, and eliminating them is all done using machine learning and computer vision. A company called Blue River Technology is using AI to detect the presence of invasive species and other biodiversity changes.

\_Ocean Health

AI can gather data from ocean locations that are hard or impossible to reach and thus, help protect species and habitats. Illegal fishing can also be tracked using AI.

AI-powered robots can be used to monitor ocean conditions such as pollution levels, temperature and pH.

\_Healthy Air

Air purifiers with AI can record air quality and environmental data in real-time and adapt the filtration efficiency.

AI-powered simulations can send warnings to people living in urban areas about the pollution levels of their areas. There are tools that can detect the pollution sources quickly and accurately.

Using data from vehicles, radar sensors and cameras AI can help improve air pollution

\_Weather forecast and Disaster resiliency

AI-powered predictive analytics along with drones, advanced sensor platforms and similar tools can monitor tremors, floods, windstorms, sea-level changes, and other possible natural hazards. This technology can help government and concerned agencies to take timely actions and the availability of such information in real-time with automated triggers can enable early evacuations when needed.

Various meteorological companies, tech companies like IBM, Palantir, and insurance companies are combining AI with traditional physics-based modelling methods to model the impact of extreme weather events on infrastructure and on their other systems to advise the disaster risk management strategies.

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