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The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. The process of agriculture expansion refers to the increase in the amount of arable land that is used for agriculture purposes. This can be done through either natural means, such as the expansion of a rivers floodplain, or through the construction of new irrigation systems. The expansion of agriculture has often been seen as a positive development, as it can lead to increased food production and a consequent increase in the standard of living for a population. However, there are also potential negative impacts of agricultural expansion, such as the loss of natural habitats and the degradation of soil quality.Agriculture expansion is the process of increasing the amount of agricultural land under cultivation. This can be done through a variety of methods, such as clearing new land for planting or converting existing pastureland into cropland. Agricultural expansion is often driven by the need to increase food production in order to meet the demands of a growing population. What is the meaning of agricultural expansion? Agricultural expansion is a major drivers of deforestation and loss of natural habitats. It also has significant impacts on local communities and ecosystems.You might likeWho's running for florida commissioner of agriculture?The increase in agricultural production over the past 35 years has been largely due to the increased use of nitrogen, phosphorus, and irrigation. This has resulted in a significant increase in the amount of land in cultivation, and a corresponding increase in food production. Why do we need agricultural expansion As our population continues to grow, we will require more food and resources. Currently, there are over 300 million people in the US. Thats expected to increase to 438 million by 2050. The only way our population can be sustained is with agricultural expansion.One of the main drivers of deforestation is agriculture. Farmland expansion is responsible for 90% of deforestation around the world, including crops grown for both human and animal consumption, as well as the clearing of forests for animal grazing. This has a major impact on the environment, as well as on the people and animals who rely on these forests for their livelihoods. How does agricultural expansion help farmers? The purpose of agricultural extension is to help farmers advance their knowledge of production techniques, as well as other aspects of agricultural development such as credit, supplies, marketing and markets. Extension services can help farmers improve their yields and produce better quality crops, which can lead to increased incomes and improved livelihoods.You might likeHow did agriculture help cause the great depression?The agricultural revolution was a turning point in human history. It led to the development of permanent settlements and the growth of civilizations. Agriculture allowed for the domestication of plants and animals, which led to the development of new technologies and the growth of cities. The agricultural revolution also had a profound impact on the environment, as it led to the clearance of forests and the conversion of grasslands to farmland. How does agriculture affect the economy? Agriculture, food, and related industries play a significant role in the US economy, contributing roughly $1264 trillion to GDP in 2021. This sector accounts for 54 percent of the countrys GDP, with the output of American farms making up around 07 percent of this total. The agricultural sector is vital to the US economy and employs millions of workers across the country.Agriculture is essential to society in many ways. It supports livelihoods by providing food, habitat, and jobs. It provides raw materials for food and other products. And it helps build strong economies through trade. How does agricultural expansion affect wildlife The study found that if current trends of farmland expansion continue, an area twice the size of Alaska will be converted to farmland by 2050, resulting in the loss of habitat for 1,300 species of birds, amphibians and mammals.You might likeHow does agriculture affect biomes?While the studys authors say that some habitat loss is inevitable as the worlds population continues to grow, they say that the loss of habitat on such a massive scale is cause for concern.This is a huge problem, says lead author Dr. Thomas M. Lohan of the University of Massachusetts, Amherst. Were talking about the loss of habitat for 25% of the worlds birds, amphibians and mammals. Thats a huge number.The studys authors say that the loss of habitat could have serious consequences for the worlds biodiversity and ecosystem health. They say that it is critical that measures be taken to slow the rate of habitat loss, such as increasing the amount of land set aside for conservation.The world is on track to lose a huge amount of biodiversity in the next few decades, says co-author Dr. Clinton N. Jenkins of the State University of New York, Syracuse. We need to take action to protect the habitats that remain and toYou might likeWhat is pto in agriculture?Biodiversity is essential for a healthy landscape and ecosystem. A monoculture (single crop) can lead to an increase in pests, as there is nothing to control their population. This can lead to a decline in crop yield, as well as increased costs for pest control. Not to mention, the natural predators of these pests will also decline as the local habitat decreases. This is why its so important to maintain biodiversity! Why does agricultural expansion cause deforestation? Around 40% of forest loss is due to commercial or industrial agriculture, which often involves the search for space to grow food, fibers or biofuel crops such as soybeans, palm oil, beef, rice, maize, cotton and sugar cane. This can have a significant impact on the environment, as well as on the local ecosystem and wildlife.It is estimated that agriculture is responsible for around 80% of deforestation in the Amazon. In addition to deforestation, agricultural practices also tend to cause significant soil erosion and river siltation, as well as aquatic contamination with agrochemicals. How does agriculture affect climate change Climate change is a major threat to global food security and agricultural production is a significant contributor to greenhouse gas emissions. Agricultural production could be changed to help reduce greenhouse gas emissions and increase carbon sequestration. Farm operators could change production practices or land use to increase the carbon stored in soil or vegetation. This would help to mitigate climate change and improve food security.You might likeWhat is the future of agriculture ffa?There are a few reasons for why increased productivity in agriculture would lead to lower prices for local food. First, increased productivity would lead to greater supply of food, which would in turn lead to lower prices. Additionally, increased productivity would also lead to higher wages for agricultural workers, which would also lead to lower prices for food. Lastly, increased productivity would lead to better access to markets for farmers, which would also lead to lower prices for food. All of these reasons together would contribute to reducing poverty among those not working in agriculture. What are the types of agricultural extension? The Agricultural Extension Services (AES) is a government organisation in charge of providing information and technical assistance to farmers. Their website contains a range of resources on topics such as integrated pest management, soil health, fertilisers, livestock and dairies.The AES also works with a number of nongovernmental organisations (NGOs) to provide information and support to farmers. These NGOs include the Highlands Soil Health Partnership, which promotes best practices for soil management and fertility, and the Highlands Fertiliser Initiative, which provides information on the latest fertiliser products and application methods.Westward expansion in the United States increased opportunities for agriculture, including the introduction of new forms of transportation such as canals and steamboats. Most farming during this time was for the purpose of feeding families and servicing small local markets. The Louisiana Purchase and American victory in the War of 1812 opened up even more land for agricultural development. Final Words Agricultural expansion is the process of converting natural ecosystems into agricultural ecosystems by clearing and/or altering land for the purpose of cultivating crops and/or raising livestock. This conversion can result in the loss of biodiversity, as well as the alteration of local climate and hydrology.Agriculture expansion is when a farmer or farm company expands their operations to include more land, animals, or crops. It can be done to increase production or to diversify the types of products a farm offers. It can also be done to take advantage of new technology or to consolidate operations. Whatever the reason, agriculture expansion can have a big impact on a farms bottom line. Share copy and redistribute the material in any medium or format for any purpose, even commercially. 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For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Deforestation is the intentional, permanent razing of forested land by people, governments, and corporations for various reasons, such as repurposing it for agricultural development or housing, or extracting resources. This is a significant global environmental issue with profound consequences for biodiversity, climate, and human well-being. The UN-REDD Report explores the linkage between deforestation and the agricultural sector and suggests ways forward for consolidating global agendas of curbing climate change.Worldwide, more than half of forest loss is due to the conversion of forests into cropland, while livestock grazing is responsible for the remaining portion. Agriculture causes deforestation by clearing forests to create land for crops and livestock, leading to biodiversity loss. High-demand crops like soybeans and palm oil and the need for grazing land drive large-scale deforestation, which leads to biodiversity loss.Agricultural expansion continues to be the main driver of deforestation and forest fragmentation worldwide. Large-scale commercial agriculture converts non-agricultural land like natural forests, grasslands, and wetlands into crops or agricultural land. Deforestation, driven largely by agricultural expansion, is a primary force reshaping ecosystems and altering climate patterns worldwide.In 1999, agricultural expansion is driving almost 90% of global deforestation, including 49. 6% from expansion for cropland and 38. 5% for other purposes. Research finds that between 90 and 99 percent of all deforestation in the tropics is driven directly or indirectly by agriculture. DeforestationForests are a vital component of Earths biodiversity, covering 31 percent of the global land area. They are home to a multitude of (Image Source: Pixabay.com) Does Agricultural Expansion Drive 90 Percent Of Global Deforestation?According to a recent report by the Food and Agriculture Organization of the United Nations (FAO), agricultural expansion is responsible for nearly 90 percent of global deforestation, a significantly greater impact than previously recognized. The findings from the new Global Remote Sensing Survey reveal that agriculture is the leading cause of deforestation across all regions except for Europe, where urban development has a larger effect. In Africa, cropland conversion is the primary factor behind forest loss.The study indicates that between 90 and 99 percent of deforestation in the tropics is driven either directly or indirectly by agricultural practices. However, only half to two-thirds of this deforestation leads to active agricultural land use. Reports highlight that significant agricultural activities, including cattle ranching, soy cultivation, and oil palm plantations, contribute to this trend. The Global Forest Resources Assessment has echoed this concerning statistic, emphasizing that agricultural development poses serious challenges to natural ecosystems.Additionally, the report notes that approximately 33 million people depend on forests for their livelihoods, underscoring the critical role forests play in sustaining communities and regulating climate patterns. The FAO warns that reversing these trends will necessitate a fundamental change in approach to address the expansive impact of agricultural expansion on global deforestation effectively. This urgent issue requires coordinated efforts to balance agricultural needs with environmental sustainability and conservation. (Image Source: Pixabay.com) What Is The Meaning Of Agricultural Expansion?Agricultural expansion involves converting non-agricultural landssuch as forests, wetlands, and natural grasslandsinto agricultural use, including crops and pastures. This phenomenon, particularly prominent in the 20th and 21st centuries, is primarily driven by the global rise in food and energy demand due to population growth. As the need for agricultural resources has escalated, wildlands have faced significant destruction as more of the earths surface is repurposed for farming and grazing activities.Read also: What Affects Your Carbon Footprint?The process encompasses the transformation of uncultivated lands into productive agricultural ecosystems, which can lead to the decline of natural habitats. In Sub-Saharan Africa and parts of East and South Asia, this expansion has been especially notable, further exacerbating environmental degradation. The continued conversion emphasizes the urgent necessity to balance agricultural expansion with the preservation of remaining forests and ecosystems.In recent developments, the rate of agricultural land expansion appears to have peaked, highlighting a critical moment for implementing sustainable farming practices. Efforts are increasingly directed towards maximizing production on existing agricultural lands, rather than further encroaching on natural environments. This shift aims to protect biodiversity while continuing to meet the growing demands of an expanding population. (Image Source: Pixabay.com) What Is A Real Life Example Of Deforestation?A forest in Sumatra, Indonesia, is being cleared for an oil palm plantation, exemplifying the rapid deforestation occurring globally. Deforestation, the large-scale removal of forests, primarily involves cutting down trees for agriculture, urban development, or logging. This process not only leads to biodiversity loss but also exacerbates soil erosion and flooding due to road-building associated with tree removal. It contributes to at least 10% of global greenhouse gas emissions and results in the extinction of 137 species daily.For instance, the Amazon Rainforest has lost about 20% of its area, with cattle ranching being the primary driver, responsible for approximately 80% of deforestation there. In 2022, deforestation accounted for 7% of global emissions, illustrating its significant environmental impact. The long-term consequences of this practice threaten ecological balance and cultural heritage, as affected communities are forced to abandon their traditional lifestyles.Examples of critical deforestation areas include Papua and Borneo in Indonesia, the Gran Chaco in Argentina, and various regions in Brazil and Haiti. The situation is dire; Haiti has cleared 99. 2% of its forests, while only 70% of Ecuador's original trees remain. The urgency of addressing deforestation is underscored by the need for sustainable development that balances economic motivations with environmental preservation. Solutions require global awareness and action to protect and restore these vital ecosystems. (Image Source: Pixabay.com) What Percentage Of Land Is Deforested?In the past 10, 000 years, nearly 99% of deforested land has been transformed into agricultural use, with current farming expansion contributing to 88% of global deforestation. Animal agriculture significantly contributes to this crisis. The net change in forest cover reflects gains from natural growth or tree planting minus forest losses. For instance, Cape Verde increased its forest size since 1990, while Japan showed minimal loss. Historically, 57% of habitable land was forested, but due to agricultural land demands, one-third has been lost over millennia.As of 2020, 3. 68 billion hectares of natural forest covered about 28% of the earths land, but by 2023, there was a reduction of 23. 9 million hectares, resulting in 14. 7 gigatons of CO emissions. Agriculture drives 70-80% of tropical deforestation, a significant concern given that 96% of this deforestation occurs in tropical forests. Since 1990, approximately 420 million hectares have been lost due to human activities, primarily agriculture and logging.Forest cover has decreased from 31. 62% to 30. 71% since the 1990s, with only 18% of forests protected from deforestation. Recent studies indicate that 90-99% of tropical deforestation stems from agricultural activities. Alarmingly, the world is still losing about 10 million hectares of forests annually, with nearly 75% of forest loss occurring since the late 1990s. This continues to be a pressing environmental issue that demands urgent attention. (Image Source: Pixabay.com) How Does Agricultural Expansion Affect Deforestation?Agricultural expansion is responsible for nearly 90% of global deforestation, with 49. 6% attributed to cropland expansion and 38. 5% to livestock grazing. Deforestation, the practice of clearing forests for various land uses, significantly impacts biodiversity, climate, and human well-being. Its consequences are substantial, creating challenges for environmental sustainability and human health. While agriculture is the main driver of deforestation worldwide, Europe uniquely experiences higher impacts from urban and infrastructure development.In Africa, cropland conversion constitutes 70-90% of forest loss, while globally, over half of deforestation is for crops and nearly 40% for livestock. Recent years have seen commodity crop production reach record levels of forest loss. A report by UN-REDD examines the connection between agriculture and deforestation, proposing strategies to align global climate goals. The increasing demand for agricultural land, driven by dietary shifts towards more meat consumption, continues to exacerbate deforestation.Read also: What Is The Greenhouse Effect Short Wavelength?Research indicates that 90-99% of tropical deforestation is linked to agriculture. The study highlights agricultures role not only in clearing land for production but also in causing permanent ecosystem changes, underscoring the urgent need for sustainable practices. (Image Source: Pixabay.com) What Is Driving Deforestation?Cutting down forests presents a significant environmental challenge, with the world losing approximately 5 million hectares of forest annually, largely in tropical regions. Agriculture is responsible for about three-quarters of this deforestation, primarily due to the expansion of croplands, livestock grazing, and products like paper. Over the past five decades, global soy production has surged over thirteenfold, with production more than doubling since 2000. This dramatic increase is primarily attributed to large commercial farmers, significantly driving deforestation.The main culprits behind this phenomenon include beef, soy, palm oil, and logging. In South America, the impacts are particularly stark, as cattle ranching and soybean farming devastate ecosystems in the Amazon, Cerrado, and Gran Chaco regions. Deforestation leads to habitat loss, biodiversity reduction, climate change due to carbon dioxide emissions, and soil erosion. Rainforests, critical for global biodiversity, are particularly affected, and the ongoing loss raises urgent conservation concerns.Research indicates that between 90% to 99% of deforestation in the tropics is directly or indirectly linked to agriculture. Thus, addressing the rising demand for these four commodities is crucial for mitigating deforestation. Consumers also have a role, as their purchasing choices can influence agricultural practices and help curb the drivers of forest loss. Understanding the socio-economic and environmental implications of deforestation is essential for developing effective strategies to preserve vital forest ecosystems. (Image Source: Pixabay.com) What Is The Biggest Cause Of Deforestation? Agriculture is the primary driver of tropical deforestation, accounting for 70-80% of forest land conversion. This process, often linked to commercial and human needs, involves clearing trees for other land uses or drastically reducing tree canopy cover. Major commodities such as beef, soy, and palm oil significantly contribute, with agriculture alone responsible for over 80% of deforestation as of 2018. The impacts of deforestation include climatic instability and biodiversity loss, as it directly causes habitat fragmentation and global warming.Deforestation is prevalent in tropical regions, largely due to beef farming, and industrial logging also plays a significant role in tree loss globally. The UNFCCC highlights agriculture as the root cause of deforestation, stressing the need to understand its drivers for effective solutions. In 2022, the world lost over 16 million acres of forest, driven primarily by the transformation of forests into cropland. While agriculture dominates in most regions, Europe has different factors influencing deforestation.The UN Food and Agriculture Organization cites that agricultural expansion, mainly for oil palm and soybean production, leads to at least 50% of global deforestation. Additionally, climate change, characterized by extreme weather events, exacerbates deforestation rates. Addressing deforestation requires recognizing agriculture's significant role, particularly the expansion of cropland, which is linked to a rise in greenhouse gas emissions. (Image Source: Pixabay.com) Should Agricultural Expansion (Deforestation) Be Modelled As An Investment Decision?This paper highlights the complexities of decision-making within agricultural households regarding deforestation, arguing that such decisions, particularly in frontier areas, should be viewed as investment choices. Forest clearing not only allows farmers to establish rights to land but is also described as a strategy for title establishment. The authors advocate for a spatially explicit approach to analyzing agricultural expansion, emphasizing that traditional methods, which merely evaluate total area converted, overlook significant impacts on biodiversity and carbon storage.The study examines four different modeling approaches concerning agricultural expansion and deforestation, revealing the consequences of their respective assumptions. A survey of more than 140 economic models indicates a consensus on key drivers of deforestation: rising agricultural prices, improved road infrastructure, and low wage levels. Additionally, it emphasizes the need to incorporate off-farm income in land-use models for a comprehensive understanding of tropical deforestation dynamics.The report also links agricultural activity to deforestation and proposes pathways for integrating climate change mitigation efforts with agricultural development. Alarmingly, findings suggest that if agricultural expansion continues unchecked, national biodiversity loss could rise by 38-52% by 2033, underscoring the necessity for doubled investments in sustainability initiatives. Overall, the paper argues for reevaluating current deforestation strategies in light of agricultural commodity investments to curb environmental degradation. Agriculture Expansion and Deforestation Agricultural expansion is the conversion of non-agricultural land like natural forests, grasslands and wetlands into crops or agricultural land. Agricultural expansion is a critical environmental issue that has far-reaching consequences for biodiversity, climate change, and human livelihoods. The expansion of agriculture, driven by the growing global population and increasing demand for food and commodities, has played a significant role in accelerating deforestation. Forests are often cleared to make way for large-scale commercial agriculture, such as palm oil plantations, soybean cultivation, cattle ranching, and timber plantations. The scale of deforestation due to agricultural expansion 1. According to the Food and Agriculture Organization (FAO), an estimated 5.2 million hectares of forest were lost each year between 2010 and 2015. 2. The World Bank reports that agriculture is responsible for around 80% of global deforestation, making it the single most significant cause of forest loss. 3. In tropical regions, such as the Amazon rainforest, Central Africa, and Southeast Asia, agricultural expansion accounts for approximately 90% of deforestation. 4. The Amazon rainforest alone lost over 2.2 million square kilometres of forest cover between 1970 and 2020, with a substantial portion cleared for agriculture. Consequences of Deforestation Loss of Biodiversity: Forests are biodiverse ecosystems, providing habitat and shelter to countless plant and animal species. The destruction of these habitats results in the loss of biodiversity, leading to species extinction. Climate Change: Deforestation releases large amounts of carbon dioxide (CO_2) into the atmosphere, contributing to climate change as Trees absorb CO_2 during photosynthesis. Soil Degradation: Forests play a crucial role in maintaining soil health by preventing erosion and promoting nutrient recycling. When forests are cleared for agriculture, the soil becomes easy to erosion, leading to loss of fertility and increased runoff of sediments into water bodies. Disruption of Water Cycles: Forests are essential in regulating local and regional water cycles. Their removal can result in reduced groundwater recharge, and increased threat to droughts and floods. 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Consumer Awareness: Educating consumers about the environmental impact of agricultural products and the importance of supporting sustainable and deforestation-free practices can drive demand for environmentally responsible products. The connection between agricultural expansion and deforestation is a significant global concern that needs urgent and effective efforts. Balancing the need for food production with conservation and sustainable land use practices is essential to protect the world's forests, biodiversity, and climate. By adopting sustainable agricultural practices, effective land use planning, and supporting forest protection initiatives, we can work towards decreasing the adverse effects of agricultural expansion on deforestation, ensuring a greener and more sustainable future for generations to come. Alexandratos, N., 1999. World food and agriculture: outlook for the medium and longer term. PNAS: Proceedings of the National Academy of Sciences, 96(11), 59085914. Google Scholar Benediktsson, J. A., and Kanellopoulos, I., 1999. Classification of multisource and hyperspectral data based on decision fusion. IEEE Transactions on Geoscience and Remote Sensing, 37(3), 13671377. Google Scholar Bischof, H., Schneider, W., and Pinz, A. J., 1992. Multispectral classification of landsat-images using neural networks. IEEE Transaction on Geoscience and Remote Sensing, 30(3), 482490. Google Scholar Busetto, L., Meroni, M., and Colombo, R., 2008. Combining medium and coarse spatial resolution satellite data to improve the estimation of sub-pixel NDVI time series. Remote Sensing of Environment, 112, 118131. Google Scholar Chang, J., Hansen, M. C., Pittman, K., Carroll, M., and DiMiceli, C., 2007. Corn and soybean mapping in the United States using MODIS time-series data sets. Agronomy Journal, 99, 16541664. Google Scholar Congalton, R. G., Balogh, M., Bell, C., Green, K., Milliken, J. A., and Ottman, R., 1998. Mapping and monitoring agricultural crops and other land cover in the Lower Colorado River Basin. Photogrammetric Engineering and Remote Sensing, 64(11), 10751118. Google Scholar De La Torre Ugarte, D., Walsh, M., Shapouri, H., and Slinksy, S., 2003. The economic impacts of bioenergy crop production on U.S. agriculture. U.S. Department of Agriculture, Office of the Chief Economist, Agricultural Economic Report 816. Google Scholar Hall, F. G., and Badhwar, G. D., 1987. Signature-extendable technology: global space-based crop recognition. IEEE Transactions on Geoscience and Remote Sensing, 25(1), 93103. Google Scholar Haralick, R. M., Caspall, F., and Simonett, D. S., 1970. Using radar imagery for crop discrimination: a statistical and conditional probability study. Remote Sensing of Environment, 1, 131142. Google Scholar Haralick, R. M., Shanmugam, K., and Dinstein, I., 1973. Textural features for image classification. IEEE Transactions on Systems, Man, and Cybernetics, 3(6), 610621. Google Scholar Haralick, R. M., Hlavka, C. A., Yokoyama, R., and Carlyle, S. M., 1980. Spectral-temporal classification using vegetation phenology. IEEE Transactions on Geoscience and Remote Sensing, 18(2), 167174. Google Scholar Hogg, H., 1986. Agriculture and resource inventory survey through aerospace remote sensing (AgRISTARS). IEEE Transactions on Geoscience and Remote Sensing, 24(1), 185. Google Scholar Jakubauskas, M. E., Legates, D. R., and Kastens, J. H., 2002. Crop identification using harmonic analysis of time-series AVHRR NDVI data. Computers and Electronics in Agriculture, 37, 127139. Google Scholar Jensen, J. R., 2005. Digital change detection. In Jensen, J. R. (ed.), Introductory Digital Image Processing: A Remote Sensing Perspective. Englewood Cliffs: Prentice-Hall, pp. 467494. Google Scholar Karjalainen, M., Kaartinen, H., and Hyypp, J., 2008. Agricultural monitoring using Envisat alternating polarization SAR images. Photogrammetric Engineering and Remote Sensing, 74(1), 117128. Google Scholar Lucas, R., Rowlands, A., Brown, A., Keyworth, S., and Bunting, P., 2007. Rule-based classification of multi-temporal satellite imagery for habitat and agricultural land cover mapping. ISPRS Journal of Photogrammetry and Remote Sensing, 62(3), 165185. Google Scholar Singh, A., 1989. Review article digital change detection techniques using remotely-sensed data. International Journal of Remote Sensing, 10(6), 9891003. Google Scholar Steele, B. M., 2000. Combining multiple classifiers. An application using spatial and remotely sensed information for land cover type mapping. Remote Sensing of Environment, 74(3), 545556. Google Scholar Tilman, D., 1999. Global environmental impacts of agricultural expansion: the need for sustainable and efficient practices. Proceedings of the National Academy of Sciences, 96(11), 59956000. Google Scholar Tilman, D., Fargione, J., Wolff, B., and dAntonio, C., 2001. Forecasting agriculturally driven global environmental change. Science, 292, 281284. Google Scholar Vailaya, A., Jain, A., Zhang, H. J., 1998. On image classification: city versus landscape. In IEEE Workshop on Content Based Access of Image and Video Libraries (CBAIVL), Santa Barbara, CA, p. 3. Google Scholar Walsh, M., De La Torre, U. D., Shapouri, H., and Slinsky, S., 2003. The economic impacts of bioenergy crop production on U.S. Agriculture. Environmental and Resource Economics, 24, 313333. Google Scholar Wang, Q., and Tenhunen, J. D., 2004. Vegetation mapping with multitemporal NDVI in North Eastern China Transect (NECT). International Journal of Applied Earth Observation and Geoinformation, 6, 1731. Google Scholar Wardlow, B. D., Egbert, S. L., and Kastens, J. H., 2007. Analysis of time-series MODIS 250 m vegetation index data for crop classification in the U.S. Central Great Plains. Remote Sensing of Environment, 108, 290310. Google Scholar Wharton, S. W., 1982. A contextual classification method for recognizing land use patterns in high resolution remotely sensed data. Pattern Recognition, 15(4), 317324. Google Scholar Agricultural expansion is a critical environmental issue that has far-reaching consequences for biodiversity, climate change, and human livelihoods. The expansion of agriculture, driven by the growing global population and increasing demand for food and commodities, has played a significant role in accelerating deforestation. Forests are often cleared to make way for large-scale commercial agriculture, such as palm oil plantations, soybean cultivation, cattle ranching, and timber plantations. The scale of deforestation due to agricultural expansion 1. According to the Food and Agriculture Organization (FAO), an estimated 5.2 million hectares of forest were lost each year between 2010 and 2015. 2. 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Balancing the need for food production with conservation and sustainable land use practices is essential to protect the world's forests, biodiversity, and climate. By adopting sustainable agricultural practices, effective land use planning, and supporting forest protection initiatives, we can work towards decreasing the adverse effects of agricultural expansion on deforestation, ensuring a greener and more sustainable future for generations to come. May 30, 2022Cite this articleReuse our work freelyHumans have been reshaping the planets land for millennia by clearing wildlands to grow crops and raise livestock. As a result, humans have cleared one-third of the worlds forests and two-thirds of wild grasslands since the end of the last ice age.This has come at a huge cost to the planets biodiversity. In the last 50,000 years and as humans settled in regions around the world wild mammal biomass has declined by 85%.Expanding agriculture has been the biggest driver of the destruction of the worlds wildlands.This expansion of agricultural land has now come to an end. After millennia, we have passed the peak, and in recent years global agricultural land use has declined.Agricultural land is the total of arable land that is used to grow crops, and pasture used to raise livestock.Measuring exactly how much land we use for agriculture is difficult. If all farms were simply rows of densely-planted crops it would be straightforward to calculate how much land is being used. Just draw a square around the field and calculate its area. But across much of the world, this is not how farming looks: its often low-density; mixed in with rural villages; in tiny smallholdings that are somewhere between a garden and a farm. Where farmland starts and ends is not always clear-cut.As a result, there is a range of estimates for how much land is used for agriculture.Here I have brought together three analyses of the change in global land use these are shown in the visualization.2 Each uses a different methodology, as explained in the chart. The UN FAO produces the bedrock data for each of these analyses from 1961 onwards; however, the researchers apply their own methodologies on top and extend this series further back in time.3As you can see, they disagree on how much land is used for agriculture, and the time at which land use peaked. But they do agree that we have passed the peak.This marks a historic moment in humanitys relationship to the planet; a crucial step in its protection of the worlds ecosystems.It shows that the future of food production does not need to follow the destructive path that it did in the past. If we continue on this path we will be able to restore space for the planets wildlands and wildlife.4Despite this reduction in agricultural land, the world has continued to produce more food. This is true of both crops and livestock.6We see this decoupling in the chart that presents the UN FAOs data. It shows that global agricultural land the green line has peaked while agricultural production the brown line has continued to increase strongly, even after this peak.7When we break each agricultural component out individually or look at it in physical rather than monetary units, we find the same trend: a continued increase in output. You can explore this data for any crop or animal product in our Global Food Explorer.This shows that feeding more people does not have to mean taking habitat away from other wildlife. This decoupling means that we can produce more while giving land back to nature at the same time.Global pasture has peaked. Global cropland has not.This might come as a surprise as global meat consumption is increasing. How, then, can pasture for livestock have peaked and now be falling?The world produces three times as much meat as it did 50 years ago. But how this meat is produced and what types of meat we eat have shifted. First, we produce a lot of pork and chicken which are not fed on pasture.Second, a lot of our beef production has moved from open pasture grazing towards more intensive farming methods; this has spared land. This presents an important dilemma: grain-fed livestock is often more land-efficient than pasture-fed livestock, so you need less land overall; but the biodiversity on grazing lands is often better than on intensive croplands.What this means is that more and more animals are being fed from crops grown on croplands, rather than on pasture. In fact, almost half of the worlds cropland is used to produce animal feed. Unfortunately, this conversion process from crops to meat is still an inefficient one, meaning we need a lot of land to produce a small amount of food.Biofuels, too, have added additional pressure on croplands, especially in countries such as the US and Brazil.Global decoupling of agricultural land and food production5While this global picture is promising, there are several reasons why we should not be complacent about this development.The first is that agricultural land use has definitely not peaked everywhere. Agricultural land use has decreased in some countries but continues to increase in others.The second is the distribution of these changes in land use across the world, and their implications for biodiversity loss and carbon emissions. The largest reductions in pasture have been across arid regions; temperate regions have also seen a reduction in recent decades; meanwhile, pasture has continued to expand in many tropical countries.8 Indeed, as I have covered elsewhere, the expansion of grazing land for beef production is still the leading driver of global (and tropical) deforestation.The reason that this shift of pasturelands from arid and temperate to tropical regions is important is that the tropics are much richer in biodiversity and carbon. Over half of the worlds species reside in tropical forests.9 Tropical forests are also large carbon sinks, and can store a lot of carbon per unit area.10The third, as I mentioned earlier, is that global croplands are still expanding. We see this in the chart. Other sources suggest that this rate of increase might be even faster.11 The World Resources Institute looks at this research in more detail here.Finally, quantifying the amount of land that is used for pasture is difficult. Here we have focused on reported agricultural land use data from the UN FAO based on census data; country reports and expert estimates, but this comes with uncertainty.12 Improving our measurement of agricultural land use potentially from satellite data would allow us to monitor changes more closely.Continued decline is not guaranteed: the future of land use rests on the decisions we make todaySeveral sources suggest that global agricultural land use has fallen in recent decades. However, a continued decline is not guaranteed.As we see from the HYDE 3.2 series in the first chart, land use reached its highest levels in the early 2000s and has declined since then, but is seeing a small rebound in recent years. Land use is still expanding across Sub-Saharan Africa and South America. As populations increase, and incomes rise, the pressure on land will continue.13This is why as I argue here improvements in crop yields and agricultural productivity are so important. Reducing land pressures by reducing meat consumption, and land dedicated to biofuels is also vital.14Fail to invest in these improvements and we risk reversing this global trend. We may end up with a short-lived and temporary peak. Make it a priority, and we can accelerate reaching this peak everywhere.I would like to thank Charles Taylor, James Rising, Erle Ellis, and Kees Klein Goldewijk for their suggestions and review of this article. I would also like to thank my colleagues, Max Roser, Pablo Rosado, and Bastian Herre for their editorial feedback.Keep reading at Our World in DataOur articles and data visualizations rely on work from many different people and organizations. When citing this article, please also cite the underlying data sources. This article can be cited as:Hannah Ritchie (2022) - After millennia of agricultural expansion, the world has passed peak agricultural land Published online at OurWorldinData.org. Retrieved from: ' [Online Resource]BibTeX citation@article{owid-peak-agriculture-land, author = {Hannah Ritchie}, title = {After millennia of agricultural expansion, the world has passed peak agricultural land}, journal = {Our World in Data}, year = {2022}, note = { }All visualizations, data, and code produced by Our World in Data are completely open access under the Creative Commons BY license. You have the permission to use, distribute, and reproduce these in any medium, provided the source and authors are credited.The data produced by third parties and made available by Our World in Data is subject to the license terms from the original third-party authors. We will always indicate the original source of the data in our documentation, so you should always check the license of any such third-party data before use and redistribution.All of our charts can be embedded in any site. Wikipedia0.0 / 0 votesAgricultural expansionAgricultural expansion describes the growth of agricultural land (arable land, pastures, etc.) in the 21st century.The agricultural expansion is often explained as a direct consequence of the global increase in food and energy requirements due to the human overpopulation (which in turn has been attributed to agricultural expansion itself), with an estimated expectation of 10 to 11 billion humans on Earth by end of this century. It is foreseen that most of the world's non-agrarian ecosystems (terrestrial and aquatic) will be affected adversely, from habitat loss, land degradation, overexploitation, and other problems. The intensified food (and biofuel) production will in particular affect the tropical regions.Most modern agriculture relies on intensive methods. Further expansion of the predominant farming types that rest on a small number of highly productive crops has led to a significant loss of biodiversity on a global scale already.In the light of the already occurring and potential massive ecological effects, the need for sustainable practices is more urgent than ever.The FAO predicts that global arable land use will continue to grow from a 1.58 billion hectares (3.9109 acres) in 2014 to 1.66 billion hectares (4.1109 acres) in 2050, with most of this growth projected to result from developing countries. At the same time, arable land use in developed countries is likely to continue its decline.A well-known example of already ongoing agricultural expansion is the proliferation of palm oil production areas or the land conversion/deforestation for soy bean production in South America. Today's land grabbing activities are often a consequence of the strive for agricultural land by growing economies.In the beginning of the 21 century the palm oil industry caused a massive deforestation in Borneo with a heavy consequences. How to pronounce agricultural expansion?How to say agricultural expansion in sign language?NumerologyChaldean NumerologyThe numerical value of agricultural expansion in Chaldean Numerology is: 3Pythagorean NumerologyThe numerical value of agricultural expansion in Pythagorean Numerology is: 8 References^Wikipedia - Select - (Chinese - Simplified) (Chinese - Traditional) Espaol (Spanish) Esperanto (Esperanto) (Japanese) Portugus (Portuguese) Deutsch (German) (Arabic) Franais (French) (Russian) (Kannada) (Korean) (Hebrew) Gaeilge (Irish) (Ukrainian

And it is about 60 % of the global gas emission rate. Water pollution pollutes the land residues, fields, grounds, and aquatic life. It unleashes the door for microbes, pests, soil erosion, and further negative causes. It harms the quality of plants, food, land, people, animals, and aquatic life. When the expansion of agriculture occur, the animals feel no secure living by themselves around other species or families. Animals lose their habitat due to deforestation and land conversion. When any natural consequence takes place on Earth, it disrupts the quality of soil. The demerits are soil erosion, compaction, salinization, acidification, and depletion of nutrients. These drawbacks occur due to irregular soil management, intensive farming methods, and environmental factors meeting stresses, reducing the fertility and productivity of the soil. Agriculture and Deforestation: A Balanced Solution Although agribusiness growth is important for mankind in many ways, still we need to adopt sustainable and less destructive deforestation solutions to tackle this expansion. Such as; The different strategy to expand agriculture is its sustainability. It uses the 3Rs techniques to represent nature neat and clean. 3 Rs means reduce, reuse, and recycle. These keys keep the soil and other related environments fresh and not messy. It saves crops from various perspectives and helps to promote organic matter. Also, it helps farmers to let them play their role more efficiently. Water conversion includes irrigation, water recycling, and water-saving technologies. You Might Like to Read: The Impact of Deforestation on the Water Cycle This method avoids artificial products and supports renewable energy like solar and wind. It helps to reduce and regulate greenhouse gas emissions and energy efficiency in agriculture. The agriculture in forest land combines the timber or its reserves with crops or the living animals in the same ecosystem. It helps to plant outdoor crops. This agroforestry expansion helps to graze cattle in forested lands and build forested parks, bringing more wildlife, improving soil quality, storing more carbon, and better addressing climate change. Such lands keep organic production almost and do not rely on chemicals. It helps to manage the land, biodiversity, and rural life. This expansion requires planning and implementing local suitability and balancing the objectives. The unique and natural-based organic products will promote fresh circumstances in the ecosystem. It does not use chemicals like pesticides, fertilizers, or genetically modified organisms (GMOs) to protect the soil and balance the environment. It certifies the standards and labels the regulations so that consumers can have a balanced and developed lifestyle and develop the surroundings. People use different ecological principles to improve soil fertility, control pests and diseases, and improve the environment. In an organic environment, everything counts as organic. It creates opportunities for the farmers to support rural lifestyles. Then they fill the needs of customers for their healthy food. And there are chances to cross the revenue, profit, and market increment. When the organic environment takes place, fresh crops are efficient. Its varieties turn up the table and increase the rate of fertility, overcome pests and diseases, and maintain a climate nontoxic. Green revolution brings soil health and pushes the nutrient cycle to the next level. It improves soil structure and controls nutrient losses due to soil erosion by filling the agricultural needs and reduces production risks. It refers to staple crops, cash crops, fruits, pulses, and vegetables and adding suitable crops to hybrids. Consumers show their preferences. The market trends that drive diversification of agricultural products to meet changing food preferences, cultural needs, and nutritional needs. The advanced era brought new technologies in the agricultural field. Those technologies are GPS-guided machines, drones, sensors, and automated systems. This movement helps to manage the practices, to increase efficiency, and to reduce project costs and resources. It was necessary to keep an eye on agricultural activities for people to use satellites to observe the field, monitor the conditions of soil, and collect data for further experiments related to agricultural expansion. People began to know about the artificial machines to protect, serve, and observe the land more conveniently without burdening human backs. The robotic tasks were planting, harvesting, spreading, and crop management. Agricultural biologists can locate the problems in biodiversity by seven keys to initiate the experiment. First, they try to recognize the matter. Secondly, they observe the quantitative and qualitative perspectives. Thirdly, they make hypotheses and fourthly, they go for theories. To progress their experiments and make directions for policies to avoid and sustain the viability of life in the ecosystem. Similarly, they achieve knowledge to keep concentration over the weather, forecasts, soil analysis, yield maps, and market data to inform decision-making and agricultural quality of the system. Government Regulations The government has established several regulations for people related to this area, such as; More than 80% of countries have corporate laws governing agricultural extension. About 70% of countries have enacted land use planning laws. They effectively regulate agriculture development. About 90% of states require environmental assessments for large agricultural projects. Agriculture subsidies and incentives average 2-5% of government budgets in agricultural economics. The FAO database provides comprehensive agricultural data since 1961. Analysis of global food production reveals that rice almost doubled from 1961 to 1996. It is accounting for 57% of all production in 1996. Comparable patterns emerge when focusing only on rice production or considering data from Europe and the United States. Global Views on Rural Advancement There are global views of agricultural expansion that occurred due to mismanagement and natural consequences. In 2010, a company got able to stop the activity of deforestation by 2020. Because, global production began to destroy the forest. And since then, deforestation due to palm oil, soy, and cocoa have increased and the production is projected to continue increasing till 2050. The disturbance of the environment impacts society. In Indonesia, private projects were going on which destroyed the rainforest. It made the life miserable of people and threatening for both people and wildlife. It stopped the food supplies due to the effects of deforestation. In the Amazon region, there is rising food for livestock, and the planting of soybeans that disturbed due to deforestation. It emitted carbon dioxide and degraded biodiversity. You Might Like to Read: Largest Rainforests in the World The Top 12 Amazing Jungles Like urban and rural places, Brazil suffered due to deforestation. But their nation put effort into combating deforestation and dealing with challenges and implementations. They made measures to protect the forest and other geographical and tropical lands. Conclusion In conclusion, rural expansion-driven factors are population growth, urbanization, and economic growth. It has significant implications for various sectors of life. Such as food security, environmental sustainability, social and economic sustainability. It has also been practiced in new technologies. International collaboration is essential to ensure agricultural expansion in a way that balances the needs of present and future generations while protecting health.

What is agricultural expansion. Causes of agricultural expansion. Agricultural expansion definition.