Title of case study	**Unraveling the cocoa genome**
Name of organization(s)	**Mars, IBM and U.S. Department of Agriculture**
Business sector	Food & Beverages; Science & Technology
Region(s) relevant to case study	☒ All regions ☐ Africa and the Arab States ☐ Asia and the Pacific ☐ Caribbean and Central America ☐ Europe ☐ Least Developed Countries ☒ North America ☐ Polar regions ☐ Small Island Developing States ☐ South America
Country(s) relevant to case study	USA (IBM and Mars headquarters)
Adaptation sector(s) relevant to case study	☐ Business ☐ Education and training ☒ Food security, agriculture, forestry and fisheries ☐ Human health ☐ Oceans and coastal areas ☒ Science, assessment, monitoring and early warning ☐ Terrestrial ecosystems ☐ Tourism ☐ Transport, infrastructure and human settlements ☐ Water resources ☐ Other (please specify):
Adaptation activity	In the past several years, the cocoa industry has been hit with a series of destructive fungal diseases that have cost the world's growers an estimated US$700 million in losses every year. In 2010, Mars, IBM and the U.S. Department of Agriculture (USDA) completed a two-year effort to sequence and annotate the cocoa genome. By analyzing the DNA of hundreds of cocoa trees in South America, Mars' scientists identified 10 distinct structure groups of the tree and their exact origins. Researchers used IBM's computational biology technology and expertise to develop a detailed genetic map, identifying the specific

	genetic traits that produce higher cocoa plant yields and resist drought or pests. To allow scientists to apply this knowledge for the benefit of cocoa growers, the genome findings have been shared through the Public Intellectual Property Resource for Agriculture (PIPRA), which supports agricultural innovation for both humanitarian and small-scale commercial purposes, and the Cacao Genome Database. The gene sequences will not be patented. The partnership blends Mars' cocoa expertise with the USDA Agricultural Research Service's experience with other crops and IBM's technology, demonstrating the role business can play in addressing global issues. The research has identified more than 35,000 unique genes within the cocoa genome.
Cost-benefit	This research is playing an important role in helping to safeguard the world's chocolate supply, making Mars' supply chain more resilient to the impacts of climate change. It will lead to quicker, more accurate breeding and allow farmers to plant better-quality cocoa that is healthier, stronger, highly productive and more resistant to pests and other threats that will be exacerbated by climate change.
Case study source(s)	Mars, Inc. website IBM "Smarter Planet" website
	CLICK FOR MORE INFO

Source: www.mars.com