

A Content Analysis of Water Sustainability in S&P 500 AFNR Companies

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Introduction

Water sustainability is a leading concern around the world (Inwald et al., 2023). With droughts and floods continuing to cause uneasiness in communities, there is concern for what the water supply will look like in the future. Water is a highly valuable natural resource, critical to supporting agriculture, industry, energy, and life. Water is the backbone of ecosystem function and creates habitat for many species of plants and animals. Water is a resource that is vital to human life and is crucial to retaining a healthy population. However, if this resource becomes scarce, depleted, or polluted, quality and quantity of life will deteriorate. Water is used in agriculture to irrigate crops, apply fertilizer, provide drinking water to livestock, and to wash produce (USDA, 2025). Similarly, water is used in agricultural, food, and natural resource (AFNR) industries to cool machinery, mix into food products, aid in processing, and sanitation (USGS, 2018). Water stewardship can be defined as using water in a way that is socially equitable, environmentally sustainable, and economically beneficial, and in terms of industry use, can expand to how water use impacts surrounding communities (UNIDO, n.d.). AFNR businesses typically produce a yearly sustainability report that highlights their operation's sustainability goals, progress, and outcomes. Sustainability reports are written by a corporation to illustrate to stakeholders and shareholders their vision and values on environmental stewardship, social responsibility, and their intended governance of these values (PwC Network, n.d.). These reports are typically shared in the form of a public document and published digitally on the corporation's website. They provide transparency to stakeholders, shareholders, suppliers, manufacturers, distributors, retailers, and consumers. Since water sustainability is essential to future AFNR business operations, we would expect AFNR corporations to be at the forefront of conserving and protecting the water supply. To identify the extent that large, publicly traded AFNR corporations integrate water sustainability initiatives in their operations, we conducted a quantitative content analysis of recent sustainability reports from AFNR corporations listed on the Standard & Poor's 500 (S&P 500) index. The objective of our study was to determine the frequency of water-related coverage within sustainability reports from AFNR companies listed on the S&P 500.

Conceptual Framework

We used the concept of Corporate Social Responsibility (CSR; Windsor, 2001) as a conceptual frame for our study. CSR has emerged as a leading framework to guide business decisions in nearly all facets of industry (Windsor, 2001). The CSR model calls for businesses to integrate societal and environmental concerns, in addition to profit, when considering business decisions and stakeholder interactions. The inclusion of CSR is particularly apparent in large, well-known industries that trade on public stock exchanges. Due to increasing public demand for advancements in agricultural sustainability, heavy pressure from grassroots environmental advocacy non-profits, internal ethical decision making, and economic opportunities, large AFNR corporations are expanding their initiatives to increase the sustainability of their operations (Luhmann & Theuvsen, 2016). Sustainability reports have been one avenue to showcase a corporation's CSR. In AFNR industries, the weight given to CSR, particularly on environmental sustainability, has the potential to reverse the negative environmental impact these large corporations have had on the environment for decades, which can increase their public image.

Methods

We conducted a quantitative content analysis to draw inferences from content to answer our research objective (Krippendorf, 2004). To determine what companies listed in the S&P 500 classify as an AFNR company, we utilized the Global Industry Classification Standard (GICS), an industry taxonomy system, to identify sectors related to AFNR. The most recent and published sustainability report from each of these companies were found using company websites. Each sustainability report was then downloaded as a PDF file and uploaded into NVivo, a coding software. Using a deductive coding approach, a codebook was first developed using *a priori* codes: water quantity; water quality; external water conservation; and other water-related information. To improve the trustworthiness of data analysis, two researchers first coded 20% of the data together to discuss criteria for coding and agreement on codes. The remaining data was coded independently. For our quantitative analysis, codes were counted as present or not present within each sustainability report to determine frequency of coverage for all reports.

Results

A total of 125 companies were identified as being categorized as an AFNR company listed on the S&P 500. Among these companies, recent sustainability reports were collected from 123 companies. While most of these reports were from 2023 to 2024, older reports (2020-2022) were only found for some companies. Our finding showed that every sustainability report referenced water in some capacity. A total of 118 (95.9%) of the reports referenced water quantity, identifying water usage totals, reduction in use, or future goals with numeric water quantity amounts. Over 80 percent ($n = 99$; 80.5%) of reports included information on water quality, referencing water pollution reduction efforts or future goals within their own water use. Slightly less than three-quarters ($n = 89$; 72.4%) of reports discussed water conservation efforts beyond water directly used in their operations. Lastly, 76.4% ($n = 94$) of reports described other water-related information beyond water quality, water quantity, and external conservation efforts.

Conclusions and Recommendations

We can conclude that the majority of the largest publicly traded AFNR companies are concerned about water sustainability and have made these concerns and their actions explicit by outlining their efforts related to water sustainability in their sustainability reports. Furthermore, most sustainability reports provided quantifiable metrics in water usage, while also describing efforts to improve water quality. Additional efforts beyond their own water usage were apparent, as most AFNR companies sought to provide additional water conservation services, such as providing clean drinking water, stream and shoreline restoration, and rebuilding aquatic habitats. These findings support the inclusion of CSR in AFNR companies regarding water sustainability. We recommend a follow-up study using qualitative analysis to further distinguish AFNR industry trends in water conservation. Lastly, our findings are promising as they indicate that large AFNR corporations have become more proactive instead of reactive when it comes to environmental issues, such as water conservation. We recommend that AFNR continue to engage with the public on efforts to conserve water quality and quantitative to both improve their CSR, and to reduce the stigma from AFNR industry's historical environmental degradation. To this end, these industries can become change agents and leaders in environmental protection as opposed to the agents inflicting the most environmental harm.

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