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del Barrio Alvarez, Daniel, and Masahiro Sugiyama. 2020. "A SWOT Analysis of Utility-Scale Solar in Myanmar"; *Energies* 13, no. 4: 884. <https://doi/10.3390/en13040884>

The rapid expansion of utility-scale solar farms across the U.S. has brought much-needed renewable energy to the grid. However, this boom has forced many project owners to look for less-than-desirable land to keep up with current growth. In many cases, solar installations are being built on farmland that's never had to comply with the level of regulations that a solar site will need to meet. Often, these locations face significant environmental challenges, particularly related to soil health and potential for erosion.

These issues not only disrupt project timelines but also cause long-term environmental damage and result in regulatory compliance complications. Unfortunately, many project owners don't realize the costly risks associated with ignoring or not taking the time to identify these issues.

This is where data analysis and proactive, prescriptive plans come into play. Profile Products, an agronomic solutions company, has studied tens of thousands of current and potential solar sites to analyze and assess the state of soil health and erosion risk on sites, offering insights that can help stakeholders develop targeted mitigation strategies.

The analysis was conducted using a tool called PV-IMPACTS, which stands for Integrated Mitigation Program for Assessment of Climate, Topography and Soils. The software evaluated more than a dozen geospatial factors on 13,900 current and potential solar project sites across the country, revealing that nearly 48% of solar projects -- representing over 323,000 acres -- are classified as at-risk for soil health issues. Poor soil health can lead to poor vegetation establishment, making erosion risk greater.

In addition to the soil health risks, the software found 29% of these projects are at-risk for erosion. This equates to more than 294,000 acres of land that could experience significant erosion leading to potential stormwater violations and project delays, impacting the sustainability of solar projects. As solar installations often require large expanses of land with stable ground for infrastructure, this dual threat of deteriorating soil health and erosion poses a significant challenge for the industry.

Developers need to consider the interconnected regulatory, environmental, economic and public perception risks associated with not proactively addressing soil health and erosion issues.

From a regulatory perspective, maintaining healthy soil and controlling erosion are crucial for compliance with environmental standards. Solar installations are often subject to strict regulations that mandate sustainable land management practices. Projects that fail to meet these standards can face penalties, costly corrective actions and long-term reputational damage, which may hinder future development opportunities.

Ensuring compliance from the start through proactive soil management can protect developers from unexpected fines and create a streamlined pathway for project approval.

Developers also need to consider the risk to the environment. If left unmanaged, erosion can lead to significant project delays due to necessary regrading or replanting, driving up costs and potentially impacting the overall project timeline. Poor soil conditions and subsequent failed vegetation growth not only disrupt site stability but also compromise the environmental integrity of the project, potentially resulting in sediment runoff into nearby ecosystems, which can affect water quality and local wildlife habitats.

Public perception and community relations also play a significant role in a solar project's success. Solar developments, particularly those in rural or agricultural areas, impact surrounding communities, who may be sensitive to how land is managed. Failed vegetation establishment or noticeable erosion issues can hurt public trust, leading to potential resistance against current or future projects.

Additionally, developers have an opportunity to further enhance community relations by boosting local agricultural productivity through introduction of native species to build pollinator-friendly habitats around solar sites. Pollinating insects such as bees and butterflies are essential to food production. Establishing such habitats on major solar projects can boost yields for nearby farms, with an estimated annual economic benefit of \$63.9 million in increased agricultural productivity.

By proactively addressing soil health and controlling erosion, developers can build goodwill, fostering a positive image as environmentally responsible and community-minded, which can translate into stronger local support.

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