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Solar Farms on Agricultural Land

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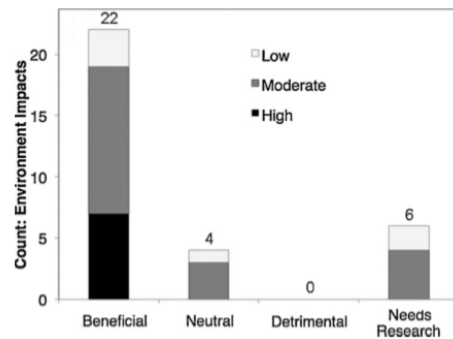
Introduction:

With farmers today facing economic hardship, many are looking for alternative sources of income. A recent trend has farmers considering turning their agriculture fields into solar farms. While there is a global push for more renewable energy, using agricultural lands to accomplish this goal is being widely debated. The opposition argues that the solar farms may come with unintended consequences including economic, environmental and even social problems (Tromans and Jackson, 2015). One of the most pressing questions is who, if anyone, should regulate the development of solar farms. Currently, there is no legislation in Maine regulating the installation of solar farms on agricultural lands.

For the sake of being proactive rather than reactive, Maine should consider adopting policies to regulate solar farms of agricultural lands. While I believe these policies should not altogether prohibit the conversion on agricultural lands into solar farms, they need to ensure the Maine's future is not being compromised. I do not think it is the governments job to tell the farmers that they cannot make a living on their own land. It is their responsibility to protect the state as a whole and its future. At this point, it is not known what impact solar farms have on the land or the area around them, thus regulating their development is in the scope of the state's responsibility. Outlined in this brief are the potential risks of solar farming, supporting the idea that they should be regulated.

Possible Long-term effects:

The long-term effects of solar farms to the environment are unknown. Could they cause so much damage to the land that it will never again be able to be used for crops? According to a study done by the National Photovoltaic Environmental Research Center, out of 32 impacts of solar energy identified, 22 were considered to be overall beneficial to the environment, 4 were neutral, 0 were detrimental, and 6 still needed further research {table 1} (Turney, Fthenakis, 2011). Impacts directly associated with agricultural lands are listed in the table below.



Turnkey, D., Fthenakis, V. (2011)

Table 3
Impacts to land use and geohydrological resources relative to traditional U.S. power generation.

Impact category	Effect relative to traditional power	Beneficial or detrimental	Priority	Comments
Soil erosion				
During construction	Less soil loss	Beneficial	Low	Existing mitigation is sufficient
During routine operation	Unknown	Unknown	Moderate	Needs research and observation
Surface water runoff				
Water quality	Improves water quality	Beneficial	Moderate	Needs research and observation
Hydrograph timing	Unknown	Unknown	Low	Needs research and observation
Waste management				
Fossil fuels waste spills	Eliminates waste stream	Beneficial	Moderate	Solar avoids fly ash spills and oil spills
Nuclear waste stream	Eliminates waste stream	Beneficial	High	Solar avoids need for waste repositories
Groundwater				
Groundwater recharge	Unknown	Unknown	Moderate	Needs research and observation
Water purity	Improves water quality	Beneficial	Moderate	Needs research and observation

Turnkey, D., Fthenakis, V. (2011) https://www.bnl.gov/pv/files/pdf/229_RSER_WildLife_2011.pdf

While none of the impacts were found to be detrimental to the environment, it should be noted that this was not a long-term study so long-term effects were not measured. Also, having 6 impacts needing further research proves that all the answers are not known. Where we are lacking scientific knowledge about the environmental impacts, the state needs to act as regulator until all of the impacts are known. At that point, the role of the state can be reassessed.

What is certain is that initially infrastructure will need to be created in order to build the solar farms, if infrastructure does not currently exist. Solar developer, Tonga Power Limited, explained the impacts of a purposed solar farm (Meridian Power Limited, 2010). As described by the power company, the development of the solar farms will need the use of heavy equipment to install the panels. This will impact the environment in different ways including digging trenches, removing topsoil, and creating roads to truck in the panels and equipment. While this is only temporary, this phase of the solar farming, needs to be regulated. If not done properly, there could be long-term effects including soil erosion, runoff, and pollution. Legislation needs to be created to mitigate these long-term effects. Policies could include mandating construction techniques that mitigate soil erosion, like installing buffers (natural buffers, silt fences, etc.) around the site. Policies should also cover post-construction clean up. This would include restoring the surrounding landscape back to its original state prior to the construction of the solar farm.

The most controversial debate about the issue is taking farm land out of use. The worry is if too much farm land is converted then we will not have enough farms to support the population. If solar pays better than crops, it would make more economic sense for farmers to convert. Facing the same problem, England created a framework to prevent this from happening (Tomans Fthenakis, 2011). In March 2012, they published the Agricultural Land Classification report (Natural England, 2009). This framework explained the classification of lands including the best and most versatile agricultural land (BMVAL), the highest classification. In the report, they recommend that the installation of solar farms should be prohibited on the BMVAL lands in order to protect the future of agriculture in England. This same framework should be applied to Maine. Agriculture is important to the history and culture of the state. Designating areas that are too important to lose to solar farms would preserve the culture and agriculture in Maine. In order to apply the same framework, extensive analysis would need to be done to determine land classification areas.

Legislation following this framework should be created in Maine. This will allow farms to supplement their income using less valuable land while still preserving high value agricultural land for current and future use.

The debate over solar farming on agricultural land still has many unknowns. Maine needs to get ahead of this issue and regulate it so that the possible negative impacts do not occur or are at least lessened and monitored.

Work Cited

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