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PAX SILICA AT CLARK: THE TRUE COST OF THE AI RUSH AND A BETTER WAY FORWARD

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Recent announcements by Philippine and United States officials have placed New Clark City in Tarlac at the center of a proposed artificial intelligence and advanced manufacturing hub under the Pax Silica initiative. The plan involves setting aside about 1,618 hectares, within New Clark City and the Luzon Economic Corridor for what has been described as the first AI-native economic security zone or "Golden Node" under Pax Silica.

In simple terms, the proposal is to turn part of Clark into a high-technology industrial area where data centers, semiconductor-related activities, critical-minerals processing, advanced manufacturing, logistics, research institutions, government agencies, and private technology firms may work together to build a massive AI infrastructure.

Supporters say the project can create quality jobs, attract major investments, and help position the Philippines in the global AI and semiconductor value chain; critics, however, warn that the same project may carry major environmental, water, energy, land-use, legal, and community impacts that must be carefully studied before binding commitments are made.

While the paper explores these concerns, it also proposes a better way forward.

The Proposed Clark AI Hub

The Clark AI hub is linked to the Philippines' decision to formally join the Pax Silica Declaration in April 2026. The government has presented the proposal as part of a broader strategy to make the Philippines a more active participant in emerging technology industries, rather than merely a source of minerals, labor, or low-value assembly. The proposed site is inside New Clark City, which has long been promoted as a smart, green, and resilient urban-industrial development in Central Luzon. Because the area is also part of the Luzon Economic Corridor, the hub is being framed as a strategic platform for logistics, energy, digital infrastructure, advanced manufacturing, and international supply-chain cooperation.

A hub of this kind would require dependable electricity, large volumes of water, transport connections, waste-management systems, environmental permits, community safeguards, and clear rules on land use, taxes, labor, and accountability.

Government statements describe the project as a way to bring in high-value investments, create jobs for Filipino engineers, researchers, computer science graduates, technicians, and other skilled workers, and encourage "brain gain," meaning opportunities for Filipino talent to work in the country instead of leaving for technology jobs abroad. At the same time, the scale of the proposal makes it more than an ordinary investment project. A hub of this kind would require dependable electricity, large volumes of water, transport connections, waste-management systems, environmental permits, community safeguards, and clear rules on land use, taxes, labor, and accountability.



Finance Secretary Frederick D. Go (left) met with U.S. Ambassador Lee Lipton and his delegation on July 9 for a wide-ranging discussion on strengthening economic ties between the Philippines and the United States. Photo from: DOF , <https://manilastandard.net/business/314764239/major-electronics-manufacturer-may-invest-in-philippines-says-dof-chief.html>

Pax Silica is a United States-led economic security initiative focused on building trusted and resilient supply chains for the technologies that power the modern digital economy. The word "silica" refers to silicon, the material closely associated with computer chips and semiconductor technology. The initiative recognizes that artificial intelligence does not run only on software. It also needs physical inputs: critical minerals, electricity, data centers, fiber optic cables, semiconductors, specialized manufacturing, logistics networks, skilled workers, and secure digital infrastructure.

Pax Silica is like an alliance for the backbone of AI. Countries that join it are expected to cooperate so that essential AI-related materials and facilities are supplied by trusted partners instead of being concentrated in places that may be politically, economically, or strategically risky. Its coverage includes critical minerals such as nickel, copper, cobalt, and chromite; semiconductor supply chains; AI data centers; advanced manufacturing; clean or reliable energy; software systems; and communication networks.

Available public reports show a growing global backlash against large AI and data-center [1] developments because of their pressure on electricity grids, water supplies, land use, and host communities. Reuters reported that New York State imposed a one-year moratorium on large data centers, Amsterdam barred new data centers or expansions until at least 2030 [2], Ireland's grid operator previously blocked new data-center connections around Dublin because of power strain, [3] and Monterey Park in California

voted to permanently ban data centers after public opposition.[4] These examples show that governments and communities are increasingly slowing, restricting, or blocking AI infrastructure when its cumulative environmental and social costs are not fully answered.

Against this backdrop of serious environmental concerns and growing international resistance to large AI and data-center projects, the policy question is no longer simply whether the Philippines should welcome AI-related investment. The deeper question is whether the Clark AI hub can be developed in a way that is scientifically sound, legally compliant, environmentally safe, socially just and economically beneficial to Filipinos.



The US-led Pax Silica coalition. Photo by: Tasos Katopodis/Getty Images), <https://cebudailynews.inquirer.net/751039/pax-silica-could-bring-200000-jobs-to-ph>



Industrial Park, photo by: Miroslav Gecovic from Pixabay, <https://pixabay.com/photos/industrial-park-detva-slovakia-7432144/>

Available public reports show a growing global backlash against large AI and data-center developments because of their pressure on electricity grids, water supplies, land use and host communities.

Environmental Risks and Resource Tradeoffs

Reservoirs may not be enough, especially during El Niño years when rainfall can drop sharply.

The proposed Clark AI hub could bring investment and jobs, but it would also require very large amounts of electricity, water, and land. Based on estimates, the hub may need about 3 gigawatts of power and 39 billion liters of water each year. Supplying this could require solar farms, LNG power, reservoirs, transmission lines, and advanced water recycling, with estimated costs accomplishing masses of billions of pesos.. This shows that the project is not only a technology proposal; it is also a major infrastructure and resource-use decision.

The land impact may be much larger than the 1,600-hectare hub itself. If solar farms and reservoirs are built offsite, the total land requirement could exceed 20,000 hectares. Much of this land could otherwise support agriculture or community use. Food-security estimates suggest that, depending on the crop, the same land could help feed roughly 250,000 to 600,000 Filipinos each year. These figures are best understood as an opportunity cost: land used for industrial energy and water systems may decrease land available for food production.

The most important issue is water. Reservoirs may not be enough, especially during El Niño years when rainfall can drop sharply. If strong recycling systems such as Zero Liquid Discharge are not required, the project may have to rely more heavily on groundwater or community water systems. That could lower water tables, affect farms and households, and increase the risk of pollution from industrial wastewater if treatment is weak.

Energy and Water Requirements

Pax Silica's demand for 3 GW of embedded generation is planned to be met through a hybrid mix of solar and LNG. About 20,000 hectares of land, mostly located outside of Central Luzon, are needed for the 2 GW solar project. When you add the cost of buying the land, which is ₱20 billion (USD 322 million), and the capital costs for building the solar plants, which is ₱124 billion (USD 2 billion), the total cost for the solar part is ₱144 billion (USD 2.32 billion). This is supported by a 1 GW LNG baseload plant in New Clark City, which has capital costs between ₱62 billion (USD 1 billion) and ₱93 billion (USD 1.5 billion). Transmission lines, which are normally about 50 km



Image from: *The Pollution Footprint* by Lion's Heart for Greenpeace- Ads of the World, <https://www.adsoftheworld.com/campaigns/the-pollution-footprint>

long and connect the offsite solar farms, add another ₱8.1–11.2 billion (USD 131–181 million). Altogether, the total cost for the energy infrastructure is ₱214–248 billion (USD 3.45–4.0 billion), showing how much money is needed to make sure there is reliable power (IRENA, 2022; Institute for Climate and Sustainable Cities, 2026).

The project's water demand is equally formidable, estimated at 39 billion liters annually. To meet this demand, reservoirs covering 390–780 hectares need to be built.



Proposed site of the Pax Silica AI hub in New Clark City. Photo from: <https://www.philstar.com/headlines/2026/07/27/2545030/scientists-group-debunks-claims-pax-silica-project>

The cost to build and line these reservoirs is between ₱60 billion (USD 968 million) and ₱115 billion (USD 1.85 billion), while just buying the land for them costs ₱390–780 million (USD 6–13 million). Adding Zero Liquid Discharge (ZLD) wastewater recycling systems increases the capital costs by ₱10–20 billion (USD 161–322 million) and brings annual operating expenses up by ₱800 million–2 billion. Over 20 years, the operating costs for recycling are ₱16–40 billion (USD 258–645 million), and over 50 years, they go up to ₱40–100 billion (USD 645 million–

1.61 billion). This shows that maintaining industrial water needs is a big financial burden, with water infrastructure costing ₱87–176 billion (USD 1.4–2.8 billion) over 20 years and ₱111–236 billion (USD 1.8–3.8 billion) over 50 years (TSMC, 2025).

Pax Silica's annual demand of 39 billion liters is the same as what would be needed to irrigate thousands of hectares of rice fields. To achieve this, reservoirs spanning 390 to 780 hectares need to be built, which would cost ₱60 to 115 billion (USD 968M to 1.85B) along with an additional ₱390 to 780 million (USD 6M to 13M) for acquiring the land. Even with reservoirs, unpredictable rainfall, especially during El Niño years, will lead to shortages in supply. Zero Liquid Discharge (ZLD) recycling technology can recover between 85 and 95 percent of wastewater, which helps lower the total amount of water needed to 6 to 20 million liters per day. However, ZLD increases capital costs by ₱10 to ₱20 billion and adds ₱800 million to ₱2 billion in annual operating expenses. Over 20 years, the total is between ₱16 billion and ₱40 billion; over 50 years, it ranges from ₱40 billion to ₱100 billion.

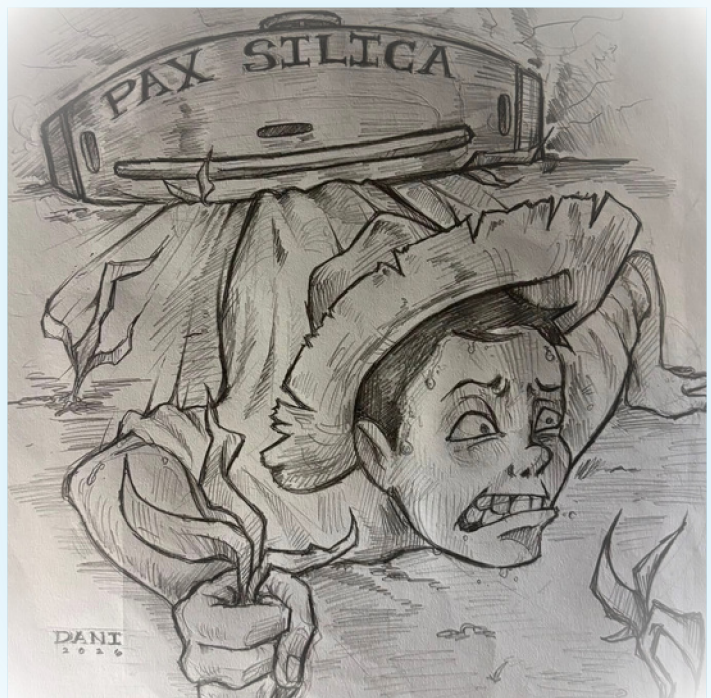


Illustration by: Dana Faith Anocha.

<https://www.facebook.com/groups/alagangparadox/permalink/27881367544813830/>



Image by Karen Pouls. Link: <https://pixabay.com/photos/water-drop-water-drop-liquid-7589539/>

Without the ZLD system, Pax Silica would experience ongoing water shortages, leading them to depend on groundwater or local water supplies. If Pax Silica's reservoirs are not used, they won't be able to meet the demand on their own. This would mean that using groundwater could lead to aquifer depletion, which would lower the water table and cause wells used by homes and farms to dry up. A shortage of clean water: millions of people living in Tarlac and Pampanga might no longer have access to safe drinking water. The risk of contamination comes from untreated wastewater from semiconductor manufacturing, which includes heavy metals, solvents, and harmful chemicals. If we don't recycle, there could be a lot of pollution in water sources, which would harm both people's health and the environment. Taiwan, Korea, and Intel Arizona have all started recycling as a way to survive. Without it, Pax Silica would face collapse due to water shortages and damage to its reputation (TSMC, 2025; World Bank, 2023). The dangers are real and immediate: they put the drinking water of millions at risk and may lead to permanent pollution of underground water sources. Unlike energy, which can be brought in from other places or varied, water has no replacement. Once aquifers are contaminated, it is almost impossible to restore them.

While ZLD is positioned as a comprehensive solution, current operational efficiency caps out at 85–90%, leaving an untreated residual stream of 5.85 billion liters of toxic waste annually (0.15 X 39.0 billion liters). Relying on ZLD without addressing this 15% deficit creates a severe operational and financial loop: re-treating this volume increases overall purification loads by 15% and adds an estimated ₱117M–₱175M in annual operational costs. If this unaddressed toxic volume is instead discharged into the environment, the long-term consequences are catastrophic. This amount of untreated effluent is sufficient to permanently poison the critical Pampanga–Tarlac aquifers within a single generation, threatening to strip millions of residents of potable water access and triggering widespread public health and economic crises across Central Luzon (World Bank, 2021; Asian Development Bank, 2022). Policy interventions must therefore mandate regulated brine stabilization and dedicated funding for secondary treatment rather than treating ZLD as a complete cure-all.[5]

Land Footprint

Pax Silica's current lease area is 1,600 hectares, yet the project requires 20,390–20,780 hectares for solar farms and reservoirs combined. This represents an excess of 18,790–19,180 hectares beyond the available site. This means that large areas of farmland in Tarlac, Pampanga, and Nueva Ecija will need to be changed to be used for industrial energy purposes. In the 1,600-hectare lease area, between 550 and 940 hectares would be used for solar panels and reservoirs, leaving little room for factories and public spaces. This shows that the amount of land needed is too much, which means Pax Silica's size doesn't fit with how much land is actually available (IRENA, 2022).

The implications are profound: diverting this land to industrial energy and water infrastructure risks undermining food sovereignty, exacerbating dependence on imported staples, and raising vulnerability to global price shocks.

The diversion of 20,390–20,780 hectares from agriculture to industrial use has profound food security consequences. If rice is planted on that land, each hectare can feed 20 to 25 Filipinos every year. So, the land that was moved could feed 408,000 to 520,000 people each year. If each hectare of land can grow enough corn to feed 24 to 29 people, then the same area of land could feed 490,000 to 603,000 people each year. Sweet potato is a crop that can grow well even in changing weather conditions. Each hectare of land used for sweet potato can feed 12 to 14 people. So, if land is taken away from sweet potato farming, it could have fed 245,000 to 291,000 people every year instead.

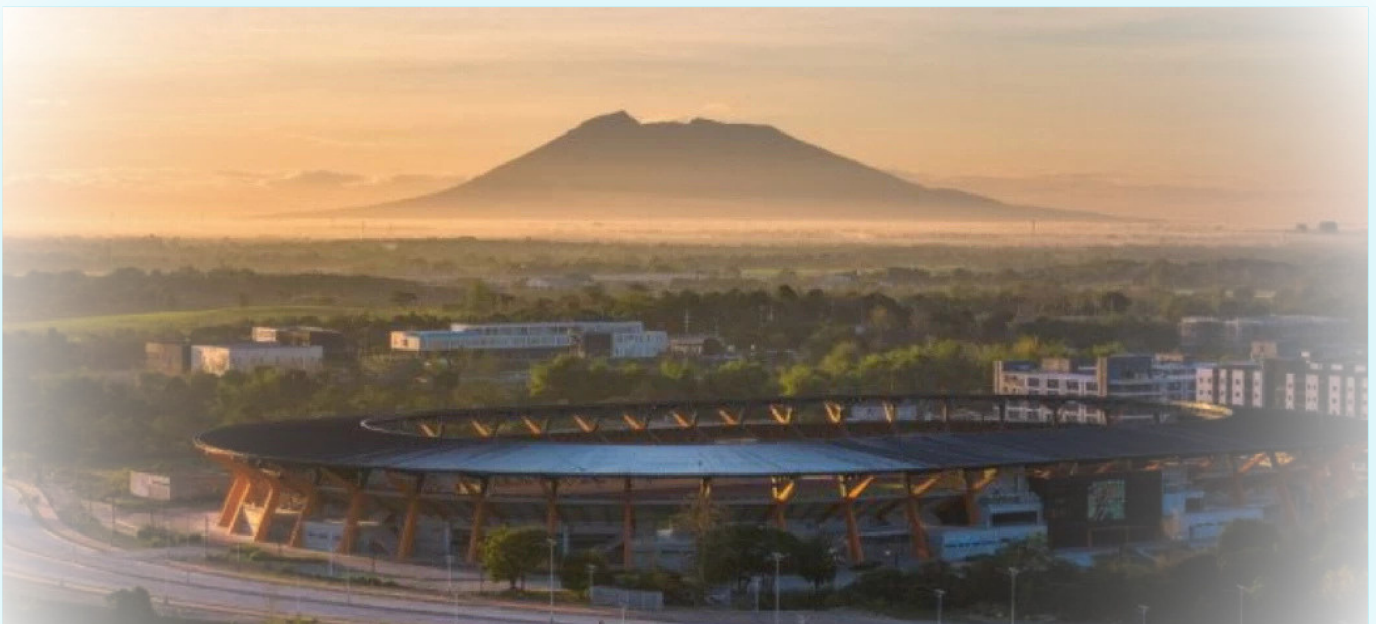


Photo from: New Clark City. BCDA, <https://mb.com.ph/2026/08/07/pax-silica-ai-hub-seen-generating-200-billion-in-philippine-exports-by-2058>

These figures represent not abstract numbers but real households in Tarlac and Pampanga—equivalent to 20–25% of Tarlac's population or 10–15% of Pampanga's population losing potential food supply. The implications are profound: diverting this land to industrial energy and water infrastructure risks undermining food sovereignty, exacerbating dependence on imported staples, and raising vulnerability to global price shocks. In effect, Pax Silica's land footprint could displace food production for a quarter to half a million Filipinos annually, creating a direct conflict between industrial expansion and community survival (FAO, 2011; Ofreneo, 2014).

Budget Issues

When the costs for energy and water are added up over 20 years, the total initial investment needed ranges from ₱301 billion to ₱424 billion (USD 4.9 billion to USD 6.8 billion). Over a period of 50 years, the long-term need increases to between ₱325 billion and ₱484 billion, which is equivalent to USD 5.2 billion to USD 7.8 billion. These numbers take into account the cost of buying land for both the solar farms and the reservoirs, giving a clearer picture of the actual financial cost involved. The scale of investment demonstrates that Pax Silica’s viability depends not only on technological feasibility but also on the capacity of the Philippine state and private sector to absorb multi-billion peso infrastructure costs (Thunder Said Energy, 2025).

Sensitivity Analysis: Revenue Achievement vs. Costs

Revenue Achievement	Relative Outcome	Fiscal Impact vs. Costs	Viability Assessment
30%	Severe shortfall	Recovers <1/3 of expected income; cannot cover ₱300B+ upfront costs	Unsustainable – massive deficits, project collapses without subsidies
40%	Major deficit	Still insufficient to cover long-term OPEX (₱40–100B for water recycling + LNG imports)	Unsustainable – heavy reliance on government subsidies
50%	Break-even risk	Covers ~half of promised revenues; infrastructure costs consume most income	Marginal: insufficient funds for community benefits or reinvestment
60%	Partial coverage	Starts to pay for operating costs but leaves little margin.	Fragile: susceptible to fluctuations in LNG prices and climate shocks
70%	Near viability	Approaches cost recovery; profitability remains narrow	Conditional – viable only if efficiency is maximized
80%	Sustainable path	Infrastructure costs and revenues start to align allowing some financial room	Possibly feasible, but it requires flawless efficiency and no shocks.

The table shows that Pax Silica's success depends a lot on how well it does in making money. When the project reaches 30 to 60% completion, it starts losing money, needing big financial support and increasing the risk of debt. Even with 70% of the goal achieved, the profit is still not very stable and can be affected by El Niño causing droughts, sudden increases in LNG prices, and the costs of water recycling. Pax Silica gets close to being sustainable at 80% achievement, but this depends on energy and water systems working almost perfectly. However, this is not likely because it would mean moving over 20,000 hectares of farmland, and there's a risk of not having enough clean water if they don't use zero liquid discharge recycling. This sensitivity analysis reinforces that postponement or cancellation is justified. Without safeguards, Pax Silica risks becoming a high-cost liability that undermines food security and community survival rather than driving national development.

Sensitivity Analysis: Food Security Impact of Land Diversion

Land Diversion Level	Crop Equivalent	People Fed per Hectare/year	Total People Deprived of Food Supply	Social Impact Assessment
20,390–20,780 ha	Rice	20–25	408,000–520,000	Severe – equivalent to 20–25% of Tarlac’s population losing staple rice
20,390–20,780 ha	Corn	24–29	490,000–603,000	Severe – equivalent to 10–15% of Pampanga’s population losing staple corn
20,390–20,780 ha	Sweet Potato	12–14	245,000–291,000	Major – loss of climate-resilient staple, undermines drought survival
20,390–20,780 ha	Bananas	18–24	367,000–498,000	Significant – loss of fruit staple, reduces dietary diversity
20,390–20,780 ha	Leafy Greens	7–9	143,000–187,000	Moderate – loss of vegetable supply can worsen nutrition gaps

This table shows that Pax Silica’s land footprint—20,390–20,780 hectares diverted from agriculture—could deprive 250,000–600,000 Filipinos annually of staple food supply, depending on crop equivalents. In terms of rice, this equals one-fifth to one-quarter of Tarlac’s population losing their staple grain. In corn terms, it equals 10–15% of Pampanga’s population losing their staple food. Even in sweet potato alternatives, which are very important during dry periods, about 250,000 people would lose access to a staple crop that can handle climate changes.

The social costs make the financial risks even worse: while the financial analysis shows that Pax Silica's performance drops below 70–80% of revenue targets, the food security analysis shows that hundreds of thousands of Filipinos lose access to basic food supplies no matter how well the company does financially. This dual lens shows that Pax Silica is not just a financial risk but also a direct danger to people's ability to survive and maintain control over their own food supply.

Fiscal and Food Security Sensitivity Analysis

Scenario	Revenue Achievement vs. ₱301-424B Upfront Costs	Fiscal Viability	Land Diversion (20,390–20,780 ha)	Food Security Impact (People Deprived Annually)	Social Viability
30% Revenue	Recovers <1/3 of expected income	Unsustainable – massive deficits, project collapses without subsidies	Rice equivalent	408,000–520,000 lose staple rice	Severe – 20–25% of Tarlac's population
40% Revenue	Still insufficient to cover OPEX and LNG imports	Unsustainable – heavy reliance on subsidies	Corn equivalent	490,000–603,000 lose staple corn	Severe – 10–15% of Pampanga's population
50% Revenue	Covers ~half of promised revenues	Marginal – no fiscal space for reinvestment	Sweet potato equivalent	245,000–291,000 lose climate-resilient staple	Major – undermines drought survival
60% Revenue	Begins to cover operating expenses	Fragile – vulnerable to shocks	Banana equivalent	367,000–498,000 lose fruit staple	Significant – worsens dietary diversity
70% Revenue	Approaches cost recovery	Conditional – viable only if efficiency maximized	Leafy greens equivalent	143,000–187,000 lose vegetable supply	Moderate – worsens nutrition gaps
80% Revenue	Revenues begin to match infrastructure costs	Potentially viable – assumes perfect efficiency	Mixed staples	250,000–600,000 lose food supply depending on crop	Persistent – food-energy conflict remains

This combined addition shows that Pax Silica's ability to work is very weak in two ways. On the financial side, the project is making less than 70 to 80 percent of the revenue it expected, which means it needs a lot of government support and increases the risk of taking on too much debt. On the social side, taking away 20,390 to 20,780 hectares of land from agriculture each year means that 250,000 to 600,000 Filipinos lose their main food supply. That's about 20 to 25% of Tarlac's population or 10 to 15% of Pampanga's population.

Even in the best-case fiscal scenario (80% revenue achievement), the food security threat remains unresolved. This dual lens shows that Pax Silica is not only a financial gamble but also a direct threat to household survival and national food sovereignty.

Impact on Biodiversity

Pax Silica should also be assessed in light of the Asian Development Bank (ADB)-backed biodiversity assessment for New Clark City, which documented important flora, fauna, aquatic ecosystems, and land-use risks in the area.

The study emphasized that New Clark City is not an empty development zone but an ecologically sensitive landscape where urban expansion may affect habitats, water systems, and species of conservation concern.



The main biodiversity concern is that Pax Silica and its supporting infrastructure could intensify habitat loss, fragmentation, and disturbance in an area already identified as needing biodiversity-sensitive planning. Site clearing, roads, utilities, lighting, noise, and increased human activity may reduce the quality of remaining habitats and disrupt wildlife movement. These impacts are especially serious where threatened or sensitive species depend on river corridors, forest patches, grasslands, or freshwater ecosystems.



Photo from: *Farmers rejects Pax Silica and land displacement by U.S.* Daily Tribune, <https://tribune.net.ph/2026/07/13/farmers-rejects-pax-silica-and-land-displacement-by-us>

Water use is another major issue. As discussed above, advanced technology and semiconductor-related facilities may require substantial water for cooling, processing, and cleaning. If withdrawals affect rivers, streams, wetlands, or groundwater, aquatic biodiversity could be harmed through reduced flows, warmer water, pollution concentration, and degraded riparian habitats.

Pollution risks also need careful control. Wastewater, construction runoff, chemicals, dust, and accidental spills could damage aquatic organisms, soil life, and food chains if treatment and monitoring are weak. Even small releases can have lasting effects when they enter streams or sediments.

In summary, the potential adverse impacts of Pax Silica on biodiversity include habitat conversion, fragmentation, disturbance of threatened or sensitive species, stress on freshwater ecosystems, and pollution risks. Consistent with the ADB-backed biodiversity assessment, the project should proceed only with transparent environmental review, strict protection of high-value habitats and river corridors, enforceable water safeguards, strong pollution controls, and independent biodiversity monitoring.

The implications are profound: diverting this land to industrial energy and water infrastructure risks undermining food sovereignty, exacerbating dependence on imported staples, and raising vulnerability to global price shocks.

Impact on Communities, Environmental Rights

Under the 1987 Philippine Constitution, Filipinos have the right to a balanced and healthful ecology, and this right is closely connected to community survival, livelihood, health, food, water, housing, and participation in decisions that affect people's lives. In *Oposa v. Factoran*, the Supreme Court recognized that environmental protection involves self-preservation and the welfare of both present and future generations. For communities near New Clark City and the wider Luzon Economic Corridor, environmental harm can therefore become a socio-economic rights issue when it threatens access to water, farmland, income, safe homes, public health, or local food supply.

The most immediate concern is water. If the project needs around 39 billion liters of water each year and relies on groundwater or community water systems during dry periods, households and farmers could face reduced access to safe and affordable water. This may affect drinking water, sanitation, irrigation, small livestock, home gardens, and local food production. If industrial wastewater is poorly treated, communities may also be exposed to contamination risks that can affect health, fisheries, soil, and long-term livelihood. In this sense, water stress is not only an environmental problem; it may infringe the basic socio-economic rights of communities to health, livelihood, food, and an adequate standard of living.

Land conversion may also harm community rights. If solar farms, reservoirs, transmission corridors, roads, and related facilities require more than 20,000 hectares beyond the core hub, agricultural land and community spaces may be displaced or placed under pressure. For farmers, farm workers, tenants, informal settlers, Indigenous peoples, and small vendors who depend on local land-based economies, this can mean loss of livelihood, higher food prices, reduced local food supply, relocation stress, and weaker community networks. The estimates that the same land could help feed roughly 250,000 to 600,000 Filipinos each year show that the project may affect not only individual landowners but also the broader public interest in food security and rural survival.



Photo from *What everyone need to know about pax Silica*
<https://rollingstonephilippines.com/state-of-affairs/artificial-intelligence/what-everyone-needs-to-know-pax-silica/>

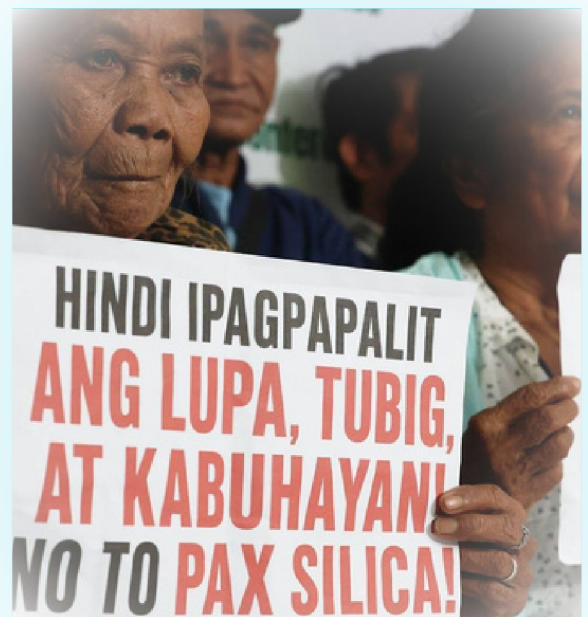
Energy demand adds another socio-economic risk. A hub requiring up to 3 gigawatts of power could strain the grid, increase dependence on imported fuel, raise emissions, or divert reliable and affordable electricity away from households, schools, hospitals, farms, and small businesses unless the power plan is transparent and additional to existing supply. If electricity prices rise or public funds are used to subsidize infrastructure mainly for industrial users, ordinary communities may indirectly pay for the project through higher utility costs, reduced public spending for basic services, or greater exposure to pollution and climate impacts.



Photo from: <https://newsinfo.inquirer.net/2278938/groups-push-anti-pax-silica-drive-as-online-petitions-reach-over-500000>

also show that mitigation is possible through renewable energy, improved cooling, refurbished or longer-life servers, circular-economy practices, transparent reporting, and stricter public standards. However, these measures only reduce harm if they are required from the start and independently monitored. These therefore support the argument that a full cumulative environmental and social impact assessment is necessary before approvals are granted.

The studies generally agree that data centers and AI infrastructure have environmental impacts that extend far beyond the server room. Life-cycle assessments show that electricity use often dominates the footprint, with one Tier 4 data-center study finding that more than 98 percent of operational impacts came from electricity consumption.[6] Other research estimates that data centers account for measurable shares of national electricity use and greenhouse-gas emissions, while also creating significant exposure to water stress. [7] These findings are directly relevant to Pax Silica because a hub requiring up to 3 gigawatts of power would not be environmentally neutral unless its electricity supply is additional, low-carbon, affordable, and transparently monitored.



An Indigenous group held a press conference in Quezon City on Aug. 6, 2026, urging the government to immediately halt the Pax Silica project. — Photo by Noy Morcoso/INQUIRER, <https://www.philstar.com/newscommentary/2026/08/08/2547897/pax-silica-and-philippine-national-interest>

Studies also show that water, cooling, and siting decisions are central to sustainability. Research on cooling systems found that cold plates and immersion cooling can reduce greenhouse-gas emissions, energy demand, and blue-water use, while other studies emphasize that water resilience, access to renewable energy, free cooling, and heat reuse should influence where data centers are located. This supports the paper's position that Pax Silica should not be approved through a narrow project-by-project review. Its water sources, cooling systems, wastewater controls, energy supply, and location choices must be assessed together through a cumulative environmental and social impact assessment.[8]



Photo from ABB powers Philippines' first AI-ready hyperscale data center with resilient, sustainable infrastructure. Philstar Tech, <https://philstartech.com/enterprise/2025/12/18/16418/abb-powers-philippines-first-ai-ready-hyperscale-data-center-with-resilient-sustainable-infrastructure/>

Several studies further emphasize that the “cloud” is materially grounded in land, equipment, water cycles, e-waste, minerals, cooling systems, and local infrastructure. Studies on circularity and IT equipment accounting warn that carbon-only methods are incomplete because they may miss embodied emissions, hazardous materials, equipment replacement, electronic waste, and other environmental burdens. This means that a credible assessment of Pax Silica must include the entire life cycle of data centers and related facilities, from construction and equipment procurement to operation, waste management, and decommissioning.[9]

The literature also warns that host communities may bear costs that are not captured by ordinary investment projections. Studies on community impacts, environmental justice, and political ecology describe water use, utility-cost increases, grid strain, noise, infrastructure pressure, extractive supply chains, and unequal distribution of environmental burdens. Case studies from Latin America also show how data-center expansion can aggravate drought-linked local impacts while offering limited local benefits. These findings reinforce the need for community consultation, water guarantees, public-disclosure rules, benefit sharing, grievance mechanisms, and independent monitoring.[10]

Finally, the studies show that mitigation measures exist but are not automatic. Renewable energy, better cooling, efficient hardware, refurbished servers, circular-energy systems, improved physical infrastructure, transparent benchmarking, region-specific reporting, strict standards, and even temporary moratoriums can reduce impacts. However, the same studies suggest that voluntary promises are insufficient. For Pax Silica, these findings support a precautionary approach: no final approval should be granted unless sustainability measures are mandatory, independently reviewed, publicly reported, and enforceable.[11]

Communities should therefore be protected before any binding commitment or construction proceeds. Protection should include a full and independent environmental and social impact assessment; genuine public consultation in languages and formats communities understand; free, prior, and informed consent where Indigenous peoples or ancestral domains may be affected; clear land-tenure and relocation safeguards; fair compensation and livelihood restoration; guaranteed priority for household and agricultural water; strict wastewater and hazardous-waste controls; transparent electricity and subsidy arrangements; local hiring and skills-training commitments; affordable grievance mechanisms; and independent monitoring with community participation. Without these safeguards, Pax Silica could shift environmental and economic burdens to local communities while reserving most benefits for industrial operators and foreign supply chains, making the project inconsistent with environmental justice and socio-economic rights.

The governance risks surrounding Pax Silica are as important as the environmental and economic risks.

Governance Concerns



Philippine President Marcos Jr. with US State Department Secretary Marco Rubio. (Photo from Presidential Communications Office) <https://cleantechnica.com/2026/08/05/op-ed-pax-silica-could-complicate-philippine-regional-sustainable-energy-goals/>

The governance risks surrounding Pax Silica are as important as the environmental and economic risks. A project of this size will involve land conversion, water allocation, power generation, public infrastructure, tax incentives, permits, foreign investors, local governments, national agencies, and private contractors. In a system where corruption, political patronage, weak enforcement, and regulatory capture are real concerns, even a technically promising project can become harmful if decisions are made behind closed doors or if public safeguards are treated as paperwork rather than binding obligations.

First, corruption risks may arise in land acquisition, infrastructure contracts, water permits, power supply agreements, tax incentives, procurement, and environmental compliance. Large projects can create opportunities for overpricing, sweetheart deals, hidden subsidies, speculative land purchases, political favors, and selective enforcement. If public funds are used to support roads, reservoirs, transmission lines, water systems, or subsidies, the public must know who benefits, who pays, and whether the contracts serve the national interest rather than private or foreign supply-chain interests.

Second, the science behind the project may be compromised if feasibility studies, environmental assessments, hydrology studies, energy forecasts, climate-risk studies, or food-security assessments are paid for, controlled, or selectively released by project proponents. Technical studies should not function as advocacy documents for approval. They must disclose assumptions, data gaps, uncertainty, worst-case scenarios, El Niño impacts, aquifer limits, wastewater risks, greenhouse-gas emissions, and the full cost of mitigation. Independent peer review is essential because communities cannot meaningfully participate if the science is incomplete, inaccessible, or biased toward a predetermined conclusion.



Photo from: *Philippines - US Friendship protest*. Daily Tribune, <https://tribune.net.ph/2026/07/04/philippine-us-friendship-day-protest>

Third, revolving-door conflicts must be addressed. Officials, consultants, regulators, or former public officers who move into roles with developers, contractors, utilities, or investors may carry inside knowledge, influence, and personal networks that weaken independent oversight. Even when no law is broken, the appearance of conflict can reduce public trust. Strong conflict-of-interest rules, cooling-off periods, asset and relationship disclosures, and recusal requirements are needed so that agencies reviewing Pax Silca are not influenced by future employment prospects or private-sector ties.

Independent peer review is essential because communities cannot meaningfully participate if the science is incomplete, inaccessible, or biased toward a predetermined conclusion.

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Fourth, the danger of fragmented review is serious. Pax Silica should not be assessed piece by piece if its real footprint includes data centers, semiconductor-related facilities, solar farms, LNG power, reservoirs, transmission lines, access roads, wastewater systems, worker housing, logistics facilities, and possible mining or mineral-processing linkages. A narrow project-by-project review which is the current system can hide cumulative and long-term impacts. The proper approach is a cumulative and programmatic assessment that asks what the entire hub and its supporting infrastructure will do to water, land, food security, air quality, climate resilience, biodiversity, communities, and public finances over decades.

Fifth, transparency must be treated as a condition of legitimacy. The framework agreement, incentive package, land arrangements, water plan, power plan, environmental studies, risk assessments, monitoring reports, and benefit-sharing commitments should be publicly available, except for narrowly justified security or commercial information. Public disclosure should occur before approvals, not after agreements are signed. Without transparency, communities cannot test official claims, Congress and local governments cannot exercise oversight, and citizens cannot know whether environmental and social costs are being traded for uncertain economic promises.

Finally, governance must include enforceable remedies. Promises of clean energy, responsible water use, local jobs, technology transfer, community protection, and environmental compliance should be written into contracts, permits, and ECC conditions with measurable targets, penalties, suspension triggers, cancellation rights, and independent monitoring. A multi-sector oversight body should include affected communities, scientists, local governments, civil society, labor representatives, and relevant regulators. Without these safeguards, Pax Silica could become another case where public resources carry the risks while private actors receive the benefits.

The governance test for Pax Silica is therefore simple: no approval should be granted unless the process is transparent, the science is independent, conflicts of interest are controlled, cumulative impacts are fully assessed, communities can participate meaningfully, and enforcement mechanisms are strong enough to stop or redesign the project if promises are not met.



Philippines' Pax Silica AI hub plan slammed for mineral 'plunder' Photo from: South China Morning Post, <https://www.scmp.com/week-asia/economics/article/3360932/philippines-pax-silica-ai-hub-plan-slammed-mineral-plunder>

Laws that could be violated if safeguards are ignored

Communities in the target hub complex, concerned citizens, and advocates may watch out for these possible laws that could be violated.

Because Pax Silica is not a single building but a network of data centers, power systems, reservoirs, solar farms, transmission lines, roads, wastewater facilities, and possible industrial processing, the assessment should not be fragmented. If the project is split into separate pieces to avoid a full cumulative or programmatic impact assessment, the review may fail to capture the true effects on water, land, air, food security, biodiversity, climate resilience, and communities—a possible violation of the Philippine Environmental Impact Statement System under Presidential Decree No. 1586.

The project could violate the National Water Code and water-rights rules if it withdraws surface water or groundwater without valid permits, exceeds authorized volumes, uses water for purposes not approved in the permit, or harms existing users such as households, farmers, and local water utilities. This is especially important because the hub is estimated to require around 39 billion liters of water per year. If reservoirs are insufficient during El Niño years and the project turns to groundwater or community water systems without lawful allocation and scientific proof of sustainability, it may prejudice existing water rights and undermine public welfare.

It could violate the Clean Water Act, Republic Act No. 9275, if cooling water, construction runoff, sewage from worker facilities, or semiconductor-related wastewater is discharged without proper permits, treatment, monitoring, and compliance with effluent standards. The risk is not limited to visible discharge into rivers or canals. It also includes groundwater contamination through leaks, seepage, chemical spills, or poorly managed wastewater systems. If Zero Liquid Discharge or equivalent recycling is necessary to prevent pollution but is not required or enforced, the project may expose communities to contamination while shifting cleanup costs to the public.



Photo from: *Farmers rejects Pax Silica and land displacement by U.S.* Daily Tribune. <https://tribune.net.ph/2026/07/13/farmers-rejects-pax-silica-and-land-displacement-by-us>



Photo from: *Making sense of Pax Silica*. <https://www.rappler.com/voices/newsletters/inside-the-newsroom-understanding-pax-silica/>

The project could violate the Clean Air Act, Republic Act No. 8749, if emissions from backup generators, LNG power facilities, construction equipment, boilers, industrial processes, or dust-producing site works exceed legal standards or operate without required permits. A hub requiring up to 3 gigawatts of power could create major air-quality and greenhouse-gas concerns if its energy plan relies heavily on fossil fuels or if pollution-control systems are weak. Air-law compliance therefore requires transparent power sourcing, permits to operate, emissions testing, dust control, and continuous monitoring.

It could violate Republic Act No. 6969, the Toxic Substances and Hazardous and Nuclear Wastes Control Act, if hazardous chemicals, batteries, fuels, coolants, solvents, electronic waste, or industrial by-products are stored, transported, treated, imported, or disposed of improperly. AI data centers and semiconductor-linked activities can generate or rely on substances that require strict inventory, containment, labeling, transport manifests, emergency response plans, and accredited treatment or disposal. Failure to comply could endanger workers, nearby communities, soil, groundwater, and ecosystems.

The project could violate the Ecological Solid Waste Management Act, Republic Act No. 9003, if construction debris, packaging waste, electronic waste, discarded equipment, and other operational wastes are not segregated, recovered, recycled, or disposed of through lawful facilities. Data-center and industrial wastes should not be treated as ordinary garbage if they contain hazardous or special waste components. Weak waste controls would increase the risk of illegal dumping, soil contamination, and public-health impacts.

It could violate the Indigenous Peoples' Rights Act, Republic Act No. 8371, if ancestral domains or Indigenous communities are affected without free, prior, and informed consent. FPIC must be meaningful, culturally appropriate, and obtained before decisions become irreversible. It cannot be reduced to a formality after land conversion, routing of infrastructure, water sourcing, or construction plans have already been decided. If Indigenous peoples' lands, water sources, sacred areas, or livelihoods are affected, the project must comply with NCIP processes and respect self-determination.

The project could conflict with land-use, zoning, agrarian, and local-government rules if agricultural land, community spaces, or areas outside the approved master plan are converted without lawful authority, public consultation, and consistency with local development plans. The research shows that the land footprint may extend far beyond the 1,600-hectare hub if solar farms, reservoirs, roads, and transmission corridors are included. If this conversion undermines food security, displaces communities, or bypasses local planning processes, legal challenges may arise under zoning ordinances, the Local Government Code, land-conversion rules, and related planning requirements.

Labor and occupational safety laws may be implicated if workers are exposed to unsafe construction conditions, hazardous substances, excessive heat, electrical risks, chemical exposure, or weak emergency protocols. The Labor Code, occupational safety and health laws, and related regulations require safe workplaces, protective equipment, training, emergency systems, and compliance monitoring. A project that promises large-scale job creation must therefore also prove that those jobs will be safe, decent, and compliant with Philippine labor standards.

If the State allows private or foreign supply-chain interests to override water access, community welfare, food security, environmental justice, or Philippine jurisdiction, Pax Silica could become vulnerable to legal challenge...



Photo from *Philippines - US Friendship protest*. Daily Tribune. <https://tribune.net.ph/2026/07/04/philippine-us-friendship-day-protest>

Finally, constitutional and governance issues may arise if public officials approve the project despite unresolved evidence of major environmental, water, food-security, social, or fiscal harms. The constitutional right to a balanced and healthful ecology, the due-process rights of affected communities, and principles of public accountability require more than promises. They require transparent agreements, independent science, meaningful consultation, enforceable safeguards, and remedies if conditions are violated. If the State allows private or foreign supply-chain interests to override water access, community welfare, food security, environmental justice, or Philippine jurisdiction, Pax Silica could become vulnerable to legal challenge not only under specific statutes, but also under the Constitution and administrative law principles.

In short, the legal risk is cumulative. Any single permit problem may be serious, but the larger danger is a pattern of weak compliance: incomplete EIA, unproven water supply, insufficient wastewater treatment, air-emission risks, hazardous-waste gaps, land conversion without adequate review, inadequate FPIC, weak labor protection, and opaque governance. For a project of this scale, legal compliance should therefore be treated as a precondition, not an afterthought.

Can there be a way forward?

It must begin by recognizing who now controls the physical infrastructure of AI.

The world's largest data-center capacity is increasingly concentrated in the hands of a small group of hyperscale operators, especially Amazon Web Services, Microsoft Azure, Google Cloud, and Meta based in the global north.^[12] These firms build or lease massive facilities to serve cloud computing, social media, e-commerce, advertising, enterprise software, and AI model training. Alongside them are large colocation and infrastructure companies such as Equinix, Digital Realty, NTT Global Data Centers, QTS, CyrusOne, Vantage, and other private-equity-backed operators that host or finance data-center capacity for corporate clients. Industry reports now describe hyperscalers as controlling a rapidly growing share of global data-center capacity, with Amazon, Microsoft, and Google alone accounting for a dominant share of hyperscale capacity, followed by Meta, Alibaba, Tencent, Oracle, Apple, and ByteDance.^[13]



Photo from: *Pro-PH' Pax Silica pushed.*
<https://cebudailynews.inquirer.net/752952/pro-ph-pax-silica-pushed>

This ownership pattern matters for Pax Silica because the environmental costs of data centers are borne locally, while the largest profits and strategic control often flow to global technology firms, cloud platforms, investors, and foreign supply chains. The project is therefore not simply about "the Philippines joining AI." It is also about whether Filipino land, water, electricity, public subsidies, and regulatory space will be used mainly to support centralized systems owned by the world's richest digital corporations. If the hub is designed primarily for hyperscale AI workloads, advertising systems, private cloud profits, or non-essential computing, it risks deepening the same imbalance discussed throughout this



Photo from: *Farmers rejects Pax Silica and land displacement by U.S.* Daily Tribune,
<https://tribune.net.ph/2026/07/13/farmers-rejects-pax-silica-and-land-displacement-by-us>

paper: local communities absorb water stress, land conversion, pollution risks, food-security losses, and higher infrastructure burdens, while decision-making and revenue remain concentrated elsewhere.

If the project depends on critical minerals, imported equipment, massive power systems, batteries, transmission lines, and semiconductor-linked activities, then the same guardrails should apply: communities must be protected, local value must be created...

A more democratic and resilient alternative is to reduce dependence on very large, centralized AI hubs and prioritize smaller, distributed, publicly accountable digital infrastructure.

This could include local servers for universities, public hospitals, local governments, cooperatives, research institutions, schools, disaster-risk systems, agriculture services, and community internet needs. Instead of building one enormous hub that demands gigawatts of power and billions of liters of water, the country can support regional data facilities that are modest in scale, energy-efficient, renewable-powered, water-light, and designed for essential public uses.

Such an approach would not reject technology.

It would redirect technology toward social needs, environmental limits, national sovereignty, and community benefit. In this way, the way forward is not simply to make Pax Silica “greener,” but to ask whether the Philippines should build an AI infrastructure model that serves people first, limits ecological harm, keeps data and decision-making more locally accountable, and avoids surrendering scarce land, water, and energy to the growth demands of a few dominant corporations.

This alternative is also consistent with emerging international guardrails for the energy transition.

The United Nations Secretary-General’s Panel on Critical Energy Transition Minerals warns that the shift to renewable energy and digital technologies must not reproduce old patterns of extraction, commodity dependence, human-rights abuse, environmental degradation, and unequal benefit-sharing. Its core message is that critical minerals such as copper, nickel, cobalt, lithium, graphite, rare earths, and other inputs for clean energy and digital infrastructure should be governed through human rights, environmental protection, transparency, traceability, accountability, value addition, circularity, and fair sharing of benefits across the whole value chain.



Photo from: US Under Secretary of State Jacob S. Helberg unveils the Pax Silica market at New Clark City. May 18, 2026. <https://www.philstar.com/business/2026/08/10/2548329/china-grip-philippine-nickel-cited-reason-back-pax-silica>

For Pax Silica, this means the Philippines should not treat AI infrastructure as isolated from mining, refining, manufacturing, energy supply, land conversion, water use, and electronic waste. If the project depends on critical minerals, imported equipment, massive power systems, batteries, transmission lines, and semiconductor-linked activities, then the same guardrails should apply: communities must be protected, local value must be created, public information must be disclosed, and environmental limits must be respected before any claim of “clean” or “strategic” development is accepted.

A way forward must also include increasing AI literacy beyond the consumptive use of AI tools.

Many public discussions treat AI literacy as learning how to use chatbots, generate images, automate office tasks, or improve productivity. While these skills may be useful, they are too narrow for a country being asked to become an active participant in the emerging technologies industries.

Education must emphasize AI use for essential public and productive purposes: aggregating information that communities, researchers, farmers, health workers, teachers, local governments, and public institutions can verify and act on; increasing the value added of information, data, and local inputs; improving disaster preparedness, public health, agricultural planning, environmental monitoring, education, transport, and social services; and helping people compare evidence, detect bias, question automated outputs, and make better collective decisions.

AI literacy should therefore build critical thinking, not dependency; analytical capacity, not passive consumption; and local problem-solving, not demand for non-essential entertainment, advertising, or convenience applications that consume energy and data-center capacity without meeting urgent social needs.

Filipinos also need civic, technical, environmental, and political literacy about AI: how models are trained, where data is

stored, who owns the servers, how much electricity and water computation requires, what labor and mineral supply chains support it, how algorithmic systems affect rights, and how public institutions can regulate or build technology for social need.

Without this broader literacy, people may become passive consumers of AI products while remaining excluded from decisions about land, water, energy, data, public spending, and national development. Education should therefore move from mere user training toward critical and productive capacity: community workshops, school curricula, university research, public-sector training, open-source tools, local-language resources, data-governance education, and support for Filipino developers, scientists, farmers, health workers, teachers, and local governments to design technology that solves real problems.

In this sense, AI literacy is part of sovereignty. It enables communities to question harmful projects, demand disclosure, participate in regulation, and imagine alternatives to centralized, foreign-controlled AI systems.



Photo from: <https://www.gmanetwork.com/news/lifestyle/artandculture/997169/kmjs-indigenous-communities-tarlac-residents-fear-losing-homes-livelihoods-to-planned-ai-hub-pax-/story/>



Illustration by: Roni Santiago, <https://mb.com.ph/2026/07/23/pax-silicas-real-challenge>



Photo from: *Farmers rejects Pax Silica and land displacement by U.S.* Daily Tribune, <https://tribune.net.ph/2026/07/13/farmers-rejects-pax-silica-and-land-displacement-by-us>

Our Recommendations

Given the scale of the proposed Pax Silica hub, the Philippines should not sign final binding commitments or allow construction to proceed until the project passes strict environmental, legal, social, fiscal, and governance tests. The evidence discussed above shows that the project may be technically possible, but its water demand, power requirement, land footprint, food-security costs, public-finance exposure, and community impacts remain unresolved. Precaution is therefore not anti-development; it is the minimum standard for responsible decision-making.

If Pax Silica can truly deliver national development, it should be able to withstand independent science, public scrutiny, lawful permitting, community consent, and enforceable accountability. If it cannot meet those standards, proceeding would risk locking the Philippines into a high-cost, high-risk project that could undermine water security, food security, environmental rights, community welfare, and national resilience.

The government should support a smaller, distributed, publicly accountable, and socially useful AI infrastructure strategy rather than a single large-scale hub whose costs may fall on communities while benefits flow outward. This means prioritizing local and regional servers for essential public services, universities, hospitals, local governments, disaster-risk systems, agriculture, education, research, and community connectivity; requiring clean, additional, and publicly verified energy; protecting water, farmland, food security, and environmental rights; applying the guardrails proposed by the UN Panel; and ensuring that Filipino communities gain real technological capability rather than simply hosting infrastructure for global hyperscalers.

The UN Panel is especially relevant because Pax Silica is not only a data-center proposal: it is tied to minerals, energy systems, industrial land use, digital infrastructure, equipment supply chains, and waste. Its standards on human rights, transparency, traceability, environmental protection, value addition, circularity, accountability, and fair benefit-sharing should therefore become minimum conditions for any Philippine participation in AI and energy-transition supply chains.

It also means investing in AI literacy that builds critical thinking, information aggregation, value-added knowledge, and productive local use instead of encouraging non-essential consumption.

The Philippine government should not measure success by the size of the data center or the volume of foreign investment alone, but by whether the project strengthens sovereignty, protects communities....



Photo by: Mico Medel, Pexels. <https://www.pexels.com/photo/protest-in-the-philippines-against-corruption-38343718/>

In practical terms, the Philippine government should not measure success by the size of the data center or the volume of foreign investment alone, but by whether the project strengthens sovereignty, protects communities, creates local value, expands democratic oversight, and directs technology toward urgent social needs.

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