



## NEWS ROUNDUP

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### ABS CBN

#### [2023 hottest recorded year as Earth nears key limit](#)

By: Rochelle Gluzman

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### BUSINESS WORLD

#### [Urban planning in the Philippines should shift to environmental realities, says expert](#)

By: Miguel Hanz L. Antivola

Urban planning in the Philippines must prioritize climate and geographical realities for holistic development, according to an expert.

## **ECO BUSINESS**

### **[\[Opinion\] Can the Philippines fulfill its 2024 climate ambitions?](#)**

By: Hannah Alcoseba Fernandez

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### **[US\\$200 million ADB loan to help prepare climate-resilient Philippine infrastructure projects](#)**

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## **FINANCIAL TIMES**

### **[Climate records tumbled 'like dominoes' during world's hottest year](#)**

By: Attracta Mooney, Steven Bernard and Kenza Bryan

The world experienced its hottest year in 2023, with “climate records tumbling like dominoes” as the global average temperature reached almost 1.5C above pre-industrial levels, the European earth observation agency has said.

## **MANILA BULLETIN**

### **[The Da Vinci Code and how it can help solve climate change](#)**

By: Joel Cuello

The Da Vinci Principle proved transformative in the 16th century—and proves exponentially even more so today in the 21st century. Leonardo Da Vinci, the polymathic, protean, and archetypal embodiment of the Renaissance man through his genius and prodigiously varied work, straddled disparate branches of knowledge from art and literature to architecture, anatomy, engineering, mathematics, astronomy, physics, chemistry, philosophy, cartography, diplomacy, and more.

## **NIKKEI ASIA**

### **[2023 smashes records for hottest year, EU scientists confirm](#)**

Last year was the planet's hottest on record by a substantial margin and likely the world's warmest in the last 100,000 years, the European Union's Copernicus Climate Change Service (C3S) said on Tuesday.

## **PHILIPPINE DAILY INQUIRER**

### **[Growing rice, growing price: Is climate-smart tech the solution?](#)**

By: Rainielle Kyle Guison

Inside the University of the Philippines Los Baños (UPLB), one can have an affordable yet filling meal at Tita Ding's Canteen. For just P25, students can have a cup of rice (P10) with half a serving of any vegetable dish.

## **THE MANILA TIMES**

### **[\[Opinion\] Appalling prospects for 2024 and beyond — wars and global warming](#)**

By: Lito Monico C. Lorenzana

At the start of a new year, people are normally buoyant that things will get better, discarding the practices of the old with new year's resolutions that are soon discarded before the first month is out. My view is contrarian: 2024 is no better than 2023. It could get worse. Then, we shall also discard 2024 and hope for a better 2025. We enjoy deluding ourselves in the looming unknowns to escape the realities of sordid and unbearable knowns.

**Information and Knowledge Management Division**

**ABS CBN**

**[2023 hottest recorded year as Earth nears key limit](#)**

By: Rochelle Gluzman

The year of 2023 was the hottest on record, with the increase in Earth's surface temperature nearly crossing the critical threshold of 1.5 degrees Celsius, EU climate monitors said Tuesday.

Climate change intensified heatwaves, droughts and wildfires across the planet, and pushed the global thermometer 1.48 C above the preindustrial benchmark, the Copernicus Climate Change Service (C3S) reported.

"It is also the first year with all days over one degree warmer than the pre-industrial period," said Samantha Burgess, deputy head of the Copernicus Climate Change Service (C3S).

"Temperatures during 2023 likely exceed those of any period in at least the last 100,000 years."

Nearly half the year exceeded the 1.5C limit, beyond which climate impacts are more likely to become self-reinforcing and catastrophic, according to scientists.

But even if Earth's average surface temperature breaches 1.5C in 2024, as some scientists predict, it does not mean the world has failed to meet the Paris Agreement target of capping global warming under that threshold.

That would occur only after several successive years above the 1.5C benchmark, and even then the 2015 treaty allows for the possibility of reducing Earth's temperature after a period of "overshoot".

2023 saw massive fires in Canada, extreme droughts in the Horn of Africa or the Middle East, unprecedented summer heatwaves in Europe, the United States and China, along with record winter warmth in Australia and South America.

"Such events will continue to get worse until we transition away from fossil fuels and reach net-zero emissions," said University of Reading climate change professor Ed Hawkins, who did not contribute to the report.

"We will continue to suffer the consequences of our inactions today for generations."

The Copernicus findings come one month after a climate agreement was reached at COP28 in Dubai calling for the gradual transition away from fossil fuels, the main cause of climate warming.

"We desperately need to rapidly cut fossil fuel use and reach net-zero to preserve the livable climate that we all depend on," said John Marsham, atmospheric science professor at the University of Leeds.

The year saw another ominous record: two days in November 2023 exceeded the preindustrial benchmark by more than two degrees Celsius.

Copernicus predicted that the 12-month period ending in January or February 2024 would "exceed 1.5 degrees Celsius above the pre-industrial level".

- Oceans in overdrive -

Reliable weather records date back to 1850, but older proxy data for climate change -- from tree rings, ice cores and sediment -- show that 2023 temperatures "exceed those of any period in at least the last 100,000 years", Burgess said.

Records were broken on every continent. In Europe, 2023 was the second-warmest year on record, at 0.17°C cooler than 2020.

2023 saw the beginning of a naturally occurring El Nino weather phenomenon, which warms waters in the southern Pacific and stokes hotter weather beyond.

The phenomenon is expected to reach its peak in 2024, and is linked to the eight consecutive months of record heat from June to December.

Ocean temperatures globally were also "persistently and unusually high", with many seasonal records broken since April.

- Soaring CO2 and methane -

These unprecedented ocean temperatures caused marine heatwaves devastating to aquatic life and boosted the intensity of storms.

Oceans absorb more than 90 percent of excess heat caused by human activity, and play a major role in regulating Earth's climate.

Rising temperatures have also accelerated the melting of ice shelves — frozen ridges that help prevent massive glaciers in Greenland and West Antarctica from slipping into the ocean and raising sea levels.

Antarctic sea ice hit record-low levels in 2023.

"The extremes we have observed over the last few months provide a dramatic testimony of how far we now are from the climate in which our civilization developed", said Carlo Buontempo, C3S director.

In 2023, carbon dioxide and methane concentrations reached record levels of 419 parts per million, and 1,902 parts per billion, respectively.

Methane is the second largest contributor to global warming after CO<sub>2</sub>, and is responsible for around 30 percent of the rise in global temperatures since the industrial revolution, according to the United Nations Environment Programme (UNEP).

## BUSINESS WORLD

### [Urban planning in the Philippines should shift to environmental realities, says expert](#)

By: Miguel Hanz L. Antivola

Urban planning in the Philippines must prioritize climate and geographical realities for holistic development, according to an expert.

“Our political constructs of provinces and regions don’t fit with the natural constructs of the ridges of mountains, watersheds, and river systems,” Paulo G. Alcazaren, urban planner and landscape architect, said in an interview with BusinessWorld.

When it comes to urban planning, he said it is important to consult economists, earth scientists, and physical planners and “just leave the politicians outside the door.”

Mr. Alcazaren suggested the government delineate the country’s 16 major river systems into areas for comprehensive planning to effectively manage resources and mitigate climate impact.

This will include benefits toward agricultural productivity, sustainable resource extractions, and proper expansion of urban settlements, he said.

Mr. Alcazaren noted there seems to be a focus on using concrete revetments, which “actually exacerbates flooding problems, and eventually compromises the ability of these river systems to adapt to climate change.”

“So we’re pouring trillions of vessels of concrete in the wrong place,” he added.

However, any sound comprehensive plan will imply a paradigm shift in governance structure, which Mr. Alcazaren noted as the main hurdle in realizing urban development.

“It’s a matter of developing and tweaking the priorities of National Economic and Development Authority (NEDA) and Department of Public Works and Highways (DPWH), even their whole framework for economic development, based on climate change realities and not political agendas,” he said.

Additionally, there are only about 7,000 environmental or urban planners in the Philippines, with limited skillsets in large-scale planning for towns and cities, according to Mr. Alcazaren.

He also said that local government units have outdated or cut-paste comprehensive land use plans, alongside physical frameworks that lack sense when paired with private real estate development.

“We are seeing a shift to focus on public infrastructure to address issues of mobility, specifically getting away from car-centric planning to mass transport,” he said.

“And we are only doing it after the fact that we expand our cities beyond our ability to cope with its problem, so we put the cart before the horse.”

Looking ahead, Mr. Alcazaren said secondary cities, such as Metro Iloilo, Tacloban, Lingayen, and Batangas, are governed by progressive administrations and have doubled down on urban plans.

“It’s easier to solve the urban problems of individual cities that are fairly independent of each other,” Mr. Alcazaren said, suggesting Metro Manila to be governed as a province to bridge cooperation among local government units.

“The myth that people have of urban planning is gleaming tall buildings, like those in BGC (Bonifacio Global City) and Makati. But it does not work for everyone in that place.”

Mr. Alcazaren noted that Metro Manila only has one to two square meters of open, accessible space — below the World Health Organization standard of nine.

“Urban development is where everyone has affordable housing, safety, can get to where they want to go without owning a car, has opportunities for education and livelihood, and has access to open green public space,” he said.

## ECO BUSINESS

### [\[Opinion\] Can the Philippines fulfill its 2024 climate ambitions?](#)

By: Hannah Alcoseba Fernandez

The Philippines ended 2023 on a sustainability high note by securing a seat on a first-ever global fund to help poor countries deal with the adverse impacts of climate change at COP28.

The coal-dependent country also showed intent to move away from fossil fuels by attracting 3 GW (gigawatts) of new renewable energy investment from the private sector in 2023; more than the total clean energy installed over the past seven years.

A law which requires big companies to take responsibility for their plastic footprint went into full swing last year in the archipelagic nation, which is the world's largest marine plastic polluter according to a 2023 study.

However, these sustainability milestones came in a year fraught with anti-mining protests, rising electricity prices as temperatures soared, and cities drowning in plastic waste.

As we enter into the new year, here are some policies needed for the Philippines to move the needle on climate action.

1. Additional 221 GW in renewable energy capacity to help drive down electricity prices  
The government's green energy auction programme last year resulted in 3 GW of renewables to be installed by 2025, as one of the policies put in place to help the country achieve its goal of 35 per cent of its energy mix powered by clean energy by 2030.

This is commendable but does little to align our country with the 1.5°C warming limit set out in the Paris Agreement as existing solar and wind capacity in the Southeast Asian nation is currently just 2 GW.

The current policy projected in the Philippines' national energy plan is 123 GW of mostly solar and wind capacity by 2050. It would need to reach 344 GW over the same period to transition its electricity system to clean power and meet the Paris 1.5°C goal, according to a study by German-based research institution Climate Analytics released in November.

This additional capacity will generate 152 terrawatt hours (Twh) of electricity, which is equivalent to the electricity needed to power almost 13 million homes in one year.

The current policy projection has no strategy to phase out fossil fuels. In fact, the latest draft energy development plan presented to private investors in September includes the need for additional coal and gas sources.

The authorities will argue that continued investment in fossil fuel sources is necessary amid declining reserves from the Malampaya natural gas field and rising electricity demand, as the country is poised for another hot summer feared to compromise a national grid already in need of an upgrade.

Just last week, the National Grid Corp. of the Philippines (NGCP) came under fire for the massive outage in Western Visayas during the New Year's Day holidays as it failed to prevent a collapse of the power transmission system that caused hardship for local communities, crippled businesses and endangered health care systems in the region.

Energy firms have promised adequate supply throughout the nation over the coming year, but Aboitiz Power Corp president Emmanuel Rubio said the key question is how much electricity will cost.

Filipinos pay more for electricity than anywhere in Southeast Asia, except for Singapore.

But the Climate Analytics research shows that as the share of renewables increases in the power mix, so does their contribution to the levelised cost of electricity (LCOE) – or the price at which the electricity generated should be sold for the system to break even at the end of its lifetime; adding more stability to prices.

By contrast, fossil fuels make electricity prices more volatile due to the country's reliance on imported coal and gas.

As long as we are forced to rely on electricity from fossil fuels, high electricity rates and unstable power will always be our reality.

## 2. "Ethical" clean energy

It isn't just mining that faces complex ethical issues in the clean energy transition. Last year saw an increase in the planned construction of wind farms in protected areas.

Rizal Wind Energy Corp, operating under Singapore-based renewable energy firm Vena Energy, was found to be eyeing the Masungi Georeserve for a wind farm development. It is the latest setback faced by the sanctuary, an important nature reserve and wildlife sanctuary about 30 miles from Manila.

Transporting and erecting heavy wind turbine towers and blades threatens the area as it requires forests to be cleared to build access roads.

“Once open and accessible, the roads will later make way for the uncontrolled and continuing entry of people and encroachment and degradation of the rest of the karst landscape and ecosystems. Its inaccessibility and harsh terrain have been the landscape’s biggest deterrent versus widespread and large-scale depredation. Put in roads and you sign its death certificate,” said Billie Dumaliang, advocacy officer and trustee at the Masungi Georeserve Foundation.

Wind turbines are known to be fatal for bats and birds, especially raptors. Masungi is home to the endangered Philippine hawk-eagle, the serpent eagle and the first record of flying foxes in the Rizal province, as well as 30 species of bats and 100 species of birds.

Aside from Masungi, the Nabas Wind Power Project unveiled plans for expansion within the Northwest Panay Peninsula Natural Park in the Visayas region last year, that is feared to cause deforestation, extensive road construction, and erosion.

It may also cause the siltation of several rivers and streams that may contaminate the supply of water for lowland communities and in the nearby world-renowned Boracay Island.

While our clean energy transition is essential, equitable as well as ethical solutions must be something policymakers consider in the coming year.

### 3. Investment in MRFs

Last year marked the first year of implementation of the extended producer’s responsibility act, which requires big companies to recover the plastic they produce and sell.

Under the law, some of the country’s largest corporate polluters, with total assets worth more than US\$1.8 million, are mandated to recover at least one-fifth of the plastic they produced in 2023.

Companies can either recover their own waste or go through waste diverters like waste picker cooperatives, junk shops or materials recovery facilities (MRFs) to recover, recycle or dispose of their plastic waste for a fee.

An MRF is a specialised plant that segregates material for recycling and prepares it for marketing to end-user manufacturers. They convert biodegradable waste into fertiliser,

which is then recycled or sold to junk shops, with residual refuse sent to sanitary landfills.

There were 11,000 MRFs in the country as of 2021, catering to around 40 per cent, or 16,418 out of the total 42,046 barangays, based on the latest data from the National Solid Waste Management Commission (NSWMC). Facilities are generally constructed out of local funds, grants, and loans.

Corporates can hasten the progress of the EPR if they can help municipalities invest in infrastructure, given that the success of the law relies on how the various waste management facilities in the archipelago collect refuse.

#### 4. Leveraging on being a board member of the loss and damage fund

Despite the criticism around Philippine head of delegation Toni Yulo-Loyzaga for not articulating a stronger stance against fossil fuels at COP28 compared to her predecessors, her team must be commended for securing the country a seat on the loss and damage fund.

The country will represent the Asia Pacific Group as a full member for 2024 and 2026 and as an alternate member in 2025, sharing the term that year with Pakistan.

Loyzaga said that having a seat on the board would give the Philippines an opportunity to influence the decision-making on who gets to have access to the fund, and how fast.

It is no secret that climate funding takes a long time to reach recipient countries.

I learnt from Rachel Herrera, commissioner of the Climate Commission of the Philippines, in a previous interview that it takes at least one to two years to carry out the entire process, from project proposal to its approval, until a member state finally gets the money.

The commission used to be the gatekeeper for accessing and receiving climate funds before the department of finance took over in 2021.

Climate finance may also be stalled if the board of the financial mechanism does not meet often, like how the Green Climate Fund, a fund set up in 2010 to disperse adaption finance to developing countries, only convenes three times a year at its headquarters in South Korea.

The entire process of accessing climate finance then becomes a competition among developing countries over who gets most of the pie. With the Philippines also vying to

host the global fund, our typhoon-weary nation might finally play the role it deserves after decades of pushing for climate justice for vulnerable countries.

## [US\\$200 million ADB loan to help prepare climate-resilient Philippine infrastructure projects](#)

The Asian Development Bank (ADB) has approved a US\$200 million loan to further support the Philippines in delivering high-quality, inclusive, climate-resilient, and low-carbon public infrastructure to boost economic growth and improve Filipinos' access to jobs, markets, and public services such as education and health care.

The second additional financing for the Infrastructure Preparation and Innovation Facility (IPIF) will support the preparation of complex and critical climate-resilient road, bridge, transport, and flood risk management projects identified by the government as flagship projects.

The loan will help accelerate early project implementation through feasibility studies and detailed engineering design that embeds climate-resilient features to support the Philippines in achieving its climate commitments and national adaptation priorities.

“The Philippines has raised its public infrastructure spending in recent years to steer the economy toward a sustainable, high-growth path,” said ADB Senior Transport Specialist Daisuke Mizusawa. “With this additional financing, we aim to help the government scale up the scope of its investments, further improve the readiness and quality of public infrastructure projects, and strengthen public investment management systems.”

ADB will assist in building up the capacity of implementing agencies such as the Department of Transportation and the Department of Public Works and Highways to implement large and complex infrastructure projects.

A US\$1.5 million technical assistance grant will support the strengthening of regulations and policies and enhance investment planning for low-carbon and climate-resilient infrastructure, and the development of frameworks and methodologies to consistently identify and mitigate climate risks in infrastructure projects.

Previous ADB support under the IPIF has helped in the preparation of more than US\$40 billion worth of ongoing and planned infrastructure investments, exceeding initial estimates. These investments were financed by ADB, other development partners, and the government.

ADB's support for infrastructure development in the Philippines has steadily grown since 2018, and now accounts for almost 60 per cent of ADB's total portfolio in the country. The bank has committed financing of US\$8.4 billion for transport projects, including the Malolos Clark Railway Project and the South Commuter Railway Project, which are part

of the North–South Commuter Railway system connecting Metro Manila to nearby northern and southern provinces.

These projects, along with other major bridge and public transport projects, are collectively expected to reduce greenhouse gas emissions by 497,866 tons per year.

The bank has also supported the preparation of about US\$1.3 billion worth of projects that aim to reduce flood risks and enable climate change adaptation in major and principal river basins, including the Integrated Flood Resilience and Adaptation Project (Phase 1).

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region.

## FINANCIAL TIMES

### Climate records tumbled 'like dominoes' during world's hottest year

By: Attracta Mooney, Steven Bernard and Kenza Bryan

The world experienced its hottest year in 2023, with “climate records tumbling like dominoes” as the global average temperature reached almost 1.5C above pre-industrial levels, the European earth observation agency has said.

Scientists from the Copernicus climate change service said that last year marked the first since records began in which every day was at least 1C warmer than pre-industrial levels, before human-induced climate change began to take effect.

Almost half of the days of 2023 were 1.5C warmer, while two days in November were more than 2C hotter.

The “unprecedented” global temperatures from June last year meant the average daily temperature of 14.98C was 0.17C higher than the previous hottest year of 2016, Copernicus said.

Nick Dunstone, a climate scientist at the UK Met Office, said 2024 would be “another record-breaking year”, as a result of the continued strength of the naturally occurring El Niño effect, which heats the Pacific Ocean surface and exacerbates global warming caused by greenhouse gases.

But the continued rise of greenhouse gases was “by far and away the largest contribution to global temperatures”, Copernicus deputy director Samantha Burgess said, with El Niño just “part of the story”.

The naturally-occurring weather phenomenon typically causes about 0.1C of warming, with the strongest effect felt in the second year of its occurrence, she added.

Under the 2015 Paris agreement, countries committed to limiting long-term temperature rises to well below 2C and ideally to 1.5C above pre-industrial levels.

Although earth reached these temperatures repeatedly last year, those were short-term breaches and did not mean countries had failed to uphold the agreement on the long-term global average, Copernicus pointed out. But it warned that the high temperatures set “a dire precedent”.

“Following the current trajectory, in a few years time the record breaking year of 2023 will probably be remembered as a cool year,” said Carlo Buontempo, director of the Copernicus climate change service.

Mauro Facchini, head of earth observation at the European Commission’s directorate general for defence industry and space, said the data showed “yet more evidence of the increasing impacts of climate change”.

Scientists have warned that extreme weather events would become more frequent and intense as global warming continues and that urgent action must be taken to cut greenhouse gas emissions by almost 45 per cent by 2030 to limit warming to within 1.5C. It is now on track for almost 3C.

“Every tenth of a degree matters,” said Friederike Otto, senior lecturer in climate science at Imperial College London’s Grantham Institute. “Aiming to keep warming to 1.5C is more important than ever. But even if we end up at 1.6C instead, it will be so much better than giving up and not trying and ending up close to 3C, which is where current policies would bring us to.”

Earth experienced its hottest summer ever last year, with heatwaves, wildfires and flooding devastating many parts of the world, showing that governments were unprepared for the consequences of climate change, Otto said.

Last month also ranked as the warmest December on record, making it the seventh month in a row to break records. The average temperature in December was 13.51C, 1.78C above the 1850-1900 level for the month.

The historical and permanent nature of climate change reflected in the data was emphasised by Copernicus. “Temperatures during 2023 likely exceed those of any period in at least the last 100,000 years,” Burgess said.

A breach of the long-term 1.5C limit is increasingly likely, she added. “We are likely to overshoot 1.5C . . . That’s the basic physics of the system and the amount of warming that is locked into the system.”

The scientist said global average sea surface temperatures were unusually high in 2023, reaching record levels for the time of year from April through December.

The El Niño effect has helped drive the higher temperatures over the past six months, but Copernicus said the natural phenomenon did not explain all of the increase in ocean surface temperatures, with record high sea surface temperatures outside of the equatorial Pacific as well.

The Hunga Tonga Hunga Ha'apai volcano eruption in 2022 also contributed to last year's warming, as it released a plume of water vapour which helped trap heat in the atmosphere.

Copernicus scientists observed that greenhouse gas concentrations have reached the highest levels ever recorded in the atmosphere, at 422 parts per million against an annual average of 280 ppm before the industrial era.

## MANILA BULLETIN

### [The Da Vinci Code and how it can help solve climate change](#)

By: Joel Cuello

The Da Vinci Principle proved transformative in the 16th century—and proves exponentially even more so today in the 21st century. Leonardo Da Vinci, the polymathic, protean, and archetypal embodiment of the Renaissance man through his genius and prodigiously varied work, straddled disparate branches of knowledge from art and literature to architecture, anatomy, engineering, mathematics, astronomy, physics, chemistry, philosophy, cartography, diplomacy, and more.

And after 500 years since his death, Da Vinci remains the preeminent 21st-century paragon for aptitudinal range.

One of Da Vinci's most celebrated areas of mastery is painting, where his oeuvre includes *Virgin of the Rocks* (c. 1493), *Salvator Mundi* (c. 1510), *Portrait of a Musician* (c. 1487), *The Last Supper* (c. 1498), and—the crème de la crème of his paintings—the *Mona Lisa* (c. 1516).

Likely in part because of his myriad interests, Da Vinci managed to produce only some 20 plus paintings in his lifetime or, more precisely, only about 20 plus paintings have been attributed to him, making each one of them all the more prized.

With no deliberate intention on my part, my professional academic travels in the last few years occasioned opportunities for me to view five of Da Vinci's extant paintings spread across three continents—Europe, Asia (the Middle East), and North America.

At the Louvre Museum in Paris in 2018, I had the chance to study Da Vinci's *Virgin of the Rocks*, *Saint John the Baptist*, and, of course, *Mona Lisa* as part of the Louvre's permanent collection in its *Peintures Italiennes* Wing.

In the United Arab Emirates in 2019, meanwhile, I encountered at the Louvre Abu Dhabi his *La Belle Ferronniere*, which at the time was on loan from the Louvre Museum in Paris.

And this past October in Washington, D.C., I had a chance meeting at the National Gallery of Art with his *Ginevra de' Benci*, the only Da Vinci painting on public display in the Americas.

Witnessing in person the handiworks of the quintessential Renaissance man was at once affirming and instructive.

As an artist, certainly ahead of his time, Da Vinci manifestly informed his works with his expertise in other fields, particularly mathematics, architecture, and the then emerging principles of modern science and engineering, in portraying perspective, symmetry, and proportions, among others. He employed, for instance, the mathematical concepts of parallel lines, the horizon line and a vanishing point to conjure the illusion of depth on a flat canvas.

And Da Vinci's expertise in anatomical drawings and physiology together with his investigations in optics and human vision further led him to pioneer the study of physiognomy by originating the concept of *moti mentali* in paintings, the depiction of fleeting and momentary mental states, thoughts, and emotions. In his groundbreaking *Mona Lisa*, the *moti mentali* concept makes the painting appear to be interactive with the observer.

Da Vinci achieved the foregoing in part through his employment of *sfumato*, a canonical painting technique of the Renaissance that creates soft transition, as opposed to sharp lines or borders, between areas of light and dark through subtle gradations of color and tones. Further, his masterful knowledge of the human vision, with its focal and peripheral regions, and his apparent understanding of the brain's ability to fill in the missing details in the fuzzy peripheral image that it perceives enabled him to make the *Mona Lisa* seem to flash a smile when she enters the observer's peripheral vision, but not when she is right at the center of the observer's visual focus, making her image seemingly interactive.

During the Renaissance, Da Vinci was not only the epicenter, but the personification, of the deliberate pulling together and convergence of disparate disciplines of knowledge for the express purpose of creating new value, that is, innovation. Such resultant Da Vinci Principle proved transformative in the 16th century, and proves exponentially even more so today in the 21st century.

As today's world continues to grow exponentially in complexity, the grand challenges currently impacting humanity and our planet—from climate change to food security to environmental degradation to public health to energy to connectivity and many more—are at once multifaceted and cross-disciplinary, requiring convergent expert knowledge from multiple disciplines to forge the sustainable and resilient solutions needed with great urgency.

Da Vinci himself and his immensely manifold works serve as a clear and present reminder today of our crucial need for an updated approach to curating, assimilating, selecting, and applying knowledge both for solutions-crafting and value-creation, that is, one that is interlinked, cross-boundary, and assiduously connective and integrative.

## NIKKEI ASIA

### [2023 smashes records for hottest year, EU scientists confirm](#)

Last year was the planet's hottest on record by a substantial margin and likely the world's warmest in the last 100,000 years, the European Union's Copernicus Climate Change Service (C3S) said on Tuesday.

Scientists had widely expected the milestone, after climate records were repeatedly broken. Since June, every month has been the world's hottest on record compared with the corresponding month in previous years.

"This has been a very exceptional year, climate-wise ... in a league of its own, even when compared to other very warm years," C3S Director Carlo Buontempo said.

C3S confirmed 2023 as the hottest year in global temperature records going back to 1850. When checked against paleoclimatic data records from sources such as tree rings and air bubbles in glaciers, Buontempo said it was "very likely" the warmest year in the last 100,000 years.

On average, in 2023 the planet was 1.48 degrees Celsius warmer than in the 1850-1900 preindustrial period, when humans began burning fossil fuels on an industrial scale, pumping carbon dioxide into the atmosphere.

Countries agreed in the 2015 Paris Agreement to try to prevent global warming surpassing 1.5C (2.7 degrees Fahrenheit), to avoid its most severe consequences.

The world has not breached that target -- which refers to an average global temperature of 1.5C over decades -- but C3S said that temperatures had exceeded the level on nearly half of the days of 2023 set "a dire precedent".

Despite the proliferation of governments' and companies' climate targets, CO2 emissions remain stubbornly high. The world's CO2 emissions from burning coal, oil and gas hit record levels in 2023.

Last year, the concentration of CO2 in the atmosphere rose to the highest level recorded, of 419 parts per million, C3S said.

It was also the first year in which every day was more than 1 C hotter than preindustrial times. For the first time, two days -- both of them in November -- were 2 C warmer than in the preindustrial period, C3S said.

Last year was 0.17 C hotter than 2016, the previous hottest year -- smashing the record by a "remarkable" margin, Buontempo said.

Alongside human-caused climate change, in 2023 temperatures were boosted by the El Nino weather phenomenon, which warms the surface waters in the eastern Pacific Ocean and contributes to higher global temperatures.

Each fraction of temperature increase exacerbates extreme and destructive weather disasters. In 2023, the hotter planet aggravated deadly heatwaves from China to Europe, extreme rain which caused floods killing thousands of people in Libya and Canada's worst wildfire season on record.

"Comparable small changes in global temperatures have huge impacts on people and ecosystems," Friederike Otto, a climate scientist who co-leads the World Weather Attribution global research collaboration.

"Every tenth of a degree matters," she added.

The economic consequences of climate change are also escalating. The U.S. suffered at least 25 climate and weather disasters with damages exceeding \$1 billion, National Centers for Environmental Information data show. Prolonged droughts ravaged soybean crops in Argentina and wheat in Spain.

## PHILIPPINE DAILY INQUIRER

### Growing rice, growing price: Is climate-smart tech the solution?

By: Rainielle Kyle Guison

Inside the University of the Philippines Los Baños (UPLB), one can have an affordable yet filling meal at Tita Ding's Canteen. For just P25, students can have a cup of rice (P10) with half a serving of any vegetable dish.

Even after rice inflation in 2023 soared to 8.7% in August and peaked to 17.9% in September, the eatery kept its prices the same.

“Yung owner po ng karinderya..., sabi po ay kahit tumaas ‘yung presyo ng bigas, ganun pa rin ‘yung [presyo] ng kanin namin... Siya mismo ang nagsabi, priority niya talaga ‘yung mga bata kasi alam niyang naka-budget lang ‘yung mga estudyante,” said Mera Balila, a server at Tita Ding's Canteen.

(The eatery owner instructed us to maintain the price of rice despite the recent price hike. He himself said that the priority is the students since he knows that they are on a budget.)

But not all eateries can keep their prices down.

Just beside Tita Ding's Canteen is Annie's Lutong Bahay, which sells a cup of rice for P12 and half a cup for P7.

When the government temporarily set a price ceiling for rice in September, President Ferdinand Marcos Jr. cited hoarding, the Russia-Ukraine conflict, and India's rice export ban as factors that drove rice inflation.

After the price cap was lifted, rice prices remained high—15.8% higher in November 2023 compared to the same month in 2022.

But hoarding and global conflicts beyond the Philippines' control are not the only inflation drivers. Other long-term threats, including climate change, are linked to the escalation of prices.

As a staple meal of Filipinos, rice is key to food security and increases in its price may contribute to food insecurity.

This prompted the government to look at several solutions, including integrating science and technology, to ramp up rice production and cushion inflationary impacts.

Among these is the increased use of satellite imaging and crop growth models. Two programs that already use these are the Philippine Rice Information System (PRiSM) and Project SARAI (Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines).

#### Agriculture from a different view

Employing satellite imagery in agriculture is not new and has been around since 1972. But it was only in 2014 that PRiSM started operations and became the first satellite-based rice monitoring system in Southeast Asia.

The base technology used in satellites is called remote sensing, according to Arlo Sabuito, Science Research Specialist of the Philippine Space Agency. The satellite's sensors can collect data that tell scientists the crop characteristics, enabling them to study hectares of farms even from afar quickly.

PRiSM has four data products: rice area and planting dates estimates, rice yield and production estimation, assessment of rice areas affected by flood or drought, and field monitoring.

Experts derive these sets of information from open-source data collected by the European Space Agency's Sentinel 1A satellite. The maps produced by PRiSM have a 95% accuracy made possible by combining satellite images with Geographic Information System and on-ground validation by their partners.

PRiSM offers coverage from the national to municipal level and is available to the public through its website.

But PRiSM Unit Head Jovino De Dios said in an interview that the system's data products are not meant to increase rice yield. While farmers can use their planting calendars, PRiSM's products are more useful for policymakers.

"Kaya kung titingnan mo, hindi farmer ang rektang tinatarget ng PRiSM. Pero ang impact nito, umaabot sa farmer, kasi nakakagawa ng tamang desisyon yung policymakers, at yung mga tao sa gobyerno na tumutulong din sa farmers," he said.

(If you look at it, PRiSM does not directly target its services to farmers. But its impact reaches farmers because policymakers can make the right decisions, and government workers who also help farmers.)

He also noted that intermediaries are needed to interpret PRiSM's outputs for farmers to use them.

## Empowering farmers

On the other hand, SARAI takes pride in the level of community involvement in their programs.

Like PRISM, SARAI also provides farm maps, planting calendars, and flood and drought assessments. Additionally, they conduct workshops for Municipal Agriculture Offices (MAOs), teaching personnel how to map farmlands in their areas using QGIS, a free software for visualizing geospatial information.

These functions enable MAOs to produce monitoring reports that allow farmers to check on their crops quickly.

With global temperatures rapidly increasing, the effects of climate change on agriculture have become more unpredictable.

“It is said that in Mindanao, they now experience typhoons in periods where they usually don’t get these. Then there are also other areas that have reported longer drought periods,” said Moises Dorado, project leader of SARAI Enhanced Agriculture Monitoring System (SEAMS), partly in Filipino.

Dorado, who is also a professor at the UPLB Institute of Agricultural and Biosystems Engineering, said that satellite technology enables farmers to address problems with their crops promptly

“If the area is flooded, you can introduce intervention if it can be drained or what,” he said, adding that farmers can be proactive to avoid crop loss and still maximize their harvests.

Eugenio Decastillo Jr., the municipal agriculturist of Dumangas in Iloilo, said SARAI projects have helped them prepare weather advisories specific for farmers in the town.

On top of this, they have also utilized SARAI’s mobile applications to monitor pest and disease and crop growth stages and development.

SARAI collects data from open source inputs from satellites such as Sentinel 1A and 2 and Landsat 8 through Google Earth Engine. Collecting data from multiple satellites has made crop monitoring possible as often as every three to five days.

In a recently funded project headed by Dorado, SARAI will implement integrated crop monitoring and forecast for rice and corn in selected LGUs. For rice, they will collaborate with farmers from Dumangas and Lupao in Nueva Ecija.

## Limits of satellite tech

PRiSM and SARAI generate near-real-time data that are useful for policymakers, farmers, and MAO personnel. However, satellite technology still has its limitations.

For PRiSM, De Dios said they still face challenges in detecting upland rice areas with satellite remote sensing. They also encounter difficulties in delineating rainfed from irrigated agriculture and distinguishing direct-seeded from transplanted crops.

To move forward, PRiSM has submitted research proposals for funding, but these have not yet been approved.

SARAI's main concern is funding constraints, hence the limited number of areas they have involved in their projects.

Dorado also pointed out that the country has very few weather stations in agricultural areas, which would be helpful in observing changing weather patterns.

"You can't have it all eh. Kapag may tinaasan kang specification, may kailangan kang babaan dahil sa limitation ng technology or ng budget," Sabuito said, explaining that satellite data with high resolution has expensive subscriptions that could run to thousands or millions of pesos.

(You can't have it all. If you upgrade a specification, you need to balance it by downgrading another because of limitations in technology or budget.)

However, there is hope that recent government pronouncements on the importance of science and technology in agriculture would pave the way for more support.

The potential of climate-smart technology does not end with monitoring agriculture and empowering local farmers. In August, the National Economic and Development Authority (NEDA) started efforts to explore programs that use remote sensing in agriculture, including both PRiSM and SARAI.

De Dios said the information PRiSM produces is expected to be useful in mapping the inflation rate of rice and other agricultural products. This can help NEDA in predicting inflation trends in the future and formulating inflation policy advice.

"By giving advanced and more accurate information, the farmers, the policymakers, or the development workers can plan ahead in the right way," he said.

## THE MANILA TIMES

### [\[Opinion\] Appalling prospects for 2024 and beyond — wars and global warming](#)

By: Lito Monico C. Lorenzana

At the start of a new year, people are normally buoyant that things will get better, discarding the practices of the old with new year's resolutions that are soon discarded before the first month is out. My view is contrarian: 2024 is no better than 2023. It could get worse. Then, we shall also discard 2024 and hope for a better 2025. We enjoy deluding ourselves in the looming unknowns to escape the realities of sordid and unbearable knowns.

#### Wars

The world can't do without wars and conflicts. It is the nature of the beast revealed over the millennia fraught with immense human suffering, loss of life and long-lasting traumas. Conversely, they are the engines of growth and, in their aftermath, produce spurts of significant progress, as in the two world wars. Foremost of these are economic growth and industrialization as countries rebuild and modernize their economies. From the ashes of war, Germany, Japan and the Soviet Union rose, and America assumed the role of the first true hegemon of the modern century. America understood only too well the value of war and its aftereffects and thus invested heavily in defense industries and continued to mobilize resources for future war efforts, maintaining its reputation as a warmongering state. Technological advancement surged as dividends of war: radar, laser, nuclear energy, GPS and computers — the lifeblood and arteries of the modern world. And the internet!

The two post-world war periods saw medical advancements and techniques in saving lives: surgery, prosthetics, cloning, the discovery of antibiotics and penicillin, and improved methods for treating infectious diseases and vaccines, which helped 21st-century medicine understand and defeat Covid-19. Paradoxically, it is a double-edged sword as it added years to human lifespans, prolonging lives, wreaking havoc on the world's population, bringing to the fore the scary reality of a 'Malthusian catastrophe' — a disequilibrium between overpopulation against the Earth's capacity to feed itself.

Major wars also resulted in political restructuring and redrawing of national boundaries, with dominant nations gobbling up smaller ones, leading to the birth of new countries, alliances and changes in political systems. For a time, World War 2 resulted in a Cold War with America and the defunct Soviet Union (USSR) on opposite camps, advocating contradictory ideologies — democracy and liberal capitalism on one end and totalitarian-socialist-communism on the other and countless permutations in between — including the dreaded theocracy, government of priests, imams and rabbis deriving its

authority from religion and the sanctity of their religious text — the Quran, Torah and the Bible. This convergence has reared its ugly head in the Middle East.

And more wars

However, we deny and close our eyes to the root cause of the Palestine and Middle East conflicts — religion, not a simple misinterpretation thereof but translating its faith-based perversions into political action. These faiths have long shrouded themselves with the cloak of geopolitics, and there seems to be no solution to these conflicts in the near term unless men of goodwill and, more importantly, moral leaders with secular predispositions take control of their governments and champion the human dignity of the adversaries.

But the foreseeable future belies these expectations. As we speak, Hezbollah, the Islamic "party of God" in Iran, is flexing its muscles and may enter the fray, sensing beleaguered Israel as weak and vulnerable even with America's sponsorship. Expect 2024 to witness an escalation with the West Bank and Lebanon in the northeast getting into the act. More killings. More blood.

Ukraine may be in its death throes as the Republicans in America awaiting the presidency of Donald Trump may no longer want to finance Ukraine. And NATO is drained out. With Ukraine abandoned by America, Putin resurrects his image in Eastern Europe, sowing renewed fear in the old Eastern alliance now within NATO's tentacles.

China's playing chicken with its daily jet sorties violating Taiwan's airspace and establishing its de facto nine-dash-line in the South China Seas, challenging the presence of America's formidable 7th fleet in what Xi Jinping considers as China's lake, is a disaster in the making.

All these could flare up anytime, escalating the current wars or even igniting new ones. But short of resulting in nuclear Armageddon, it is nothing comparable to what has been staring us in the face — the big elephant in the room.

Climate change-global warming

For the uninitiated, climate change will spell the end of the human species if not mitigated. The United Nations' definition of climate change: "refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat-trapping gases."

The United Nations Intergovernmental Panel on Climate Change (IPCC) has warned that the Earth's climate is unequivocally warming. Since the pre-industrial era, the global average temperature increased by 1.1 degrees Celsius. Unless mitigated, it is expected to continue increasing to a tipping point, the threshold beyond which the deterioration becomes irreversible, even if, by that time, the factors causing this temperature increase are eliminated.

Scientists disagree on the exact tipping point. But this is irrelevant, academic and stupid. The imperatives are putting in effect the Paris Agreement protocols to veer away from the tipping point. This international treaty on climate change adopted in 2015 covers climate mitigation, adaptation, and finance. Agreed to by almost 200 countries, its basic aim is "to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius."

The overall strategy is to reduce greenhouse gas emissions. Some of the key stipulations include shifting away from fossil fuels and switching to renewable energy (solar, wind); promoting energy-efficient practices, technologies and infrastructures reducing energy consumption; and using electric vehicles and improving public transportation.

Protect and conserve existing forests, undertaking large-scale reforestation, effectively capturing and storing carbon dioxide to offset emissions. Implement sustainable farming practices, reducing deforestation for agriculture and encouraging regenerative land management techniques. And to incentivize businesses, particularly in the developed world, to implement policies like carbon pricing and cap-and-trade systems.

Where we are at

Now, the reality is that the Paris Agreement requires monitoring and reporting of carbon and greenhouse gas emissions, but it does not have the ability to force a country to reduce emissions. The law-making system of each country has preponderance over the decisions made according to the Paris Agreement. Even peer pressure and soft power are lame instruments for coercive sanctions.

The biggest transgressors currently responsible for the most emissions are the world's two biggest economies, China and America. In June 2017, President Trump withdrew from the Paris Agreement. And China abandons its commitments.

Planet Earth is currently not on track to stay below the goals of the Paris Agreement. And scientists with tongue-in-cheek declare that we are on track to the sixth mass extinction in the Earth's geological history.

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