

## Viewpoint: “On the wrong side of humanity and science”, Greenpeace Philippines launches last gasp effort to derail GMO Golden Rice approval

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Just weeks after the Philippine government fully embraced the global scientific consensus and endorsed the safety of Golden Rice, Greenpeace Philippines is again trying to derail what now appears inevitable: The Philippines is set to become the first country to grow and make available to the public nutritionally-enhanced GMO Golden Rice.

Greenpeace has called on the government to revoke its December decision that puts approval on a fast track. After nearly two decades of trying to derail the humanitarian project, including illegally destroying test crops and mounting a global disinformation campaign, the environmental group is now resorting to technical objections. It's arguing that the Philippine government erred in not following the 'precautionary principle', a controversial regulatory concept that considers all the potential hazards of a decision or policy but ignores any potential benefits, and so prevents cost-benefit analysis.



Greenpeace has engaged in protests against Golden Rice for more than 20 years.

It's a notion widely deployed by European-based activist groups to block biotechnology innovation. Philippine officials say Greenpeace's appeal is unlikely to sway legislators who have spent years reviewing the science, and are now convinced the time has come to green light the Vitamin-A enhancing staple.

Vitamin A deficiency (VAD) is one of the most significant public health threats in the world, killing between one and two million children annually. It is also the leading cause of childhood blindness globally. Golden Rice, the GMO crop engineered to combat VAD in populations where rice is the staple food, has the potential to dramatically cut the number of cases. As science writer Matt Ridley observed recently:

Given the scale of human suffering Golden Rice could address, there may be no better example of a purely philanthropic project in the whole of human history. Yet some misguided environmental activists still oppose Golden Rice to this day.

### **How the Philippines reached its decision to green light Golden Rice**

Let us for a moment not challenge the monstrous limitation on progress which the precautionary principle generally embodies. Let us instead look at the record of regulators in the Philippines. They examined in detail all the required evidence submitted by the Philippines Rice Research Institute (PhilRice) and the International Rice Research Institute (IRRI) and found that there was no potential health risk posed by Golden Rice consumed as food or animal feed, including in processed form. They joined the government regulators of Australia, Canada, New Zealand and the USA, who had also, effectively, applied the precautionary principle – looking only for potential harm (and finding none), while ignoring potential good.



Before approving Golden Rice, regulators in the Philippines also considered all the submissions made during the 60-day public comment period allowed by Philippine law, which started on July 25, 2017. From what Greenpeace has said, it appears the group made comments in October 2019, two years late. Are Greenpeace not members of the public? Nowhere in their [22-page decision](#) did the regulators refer at all to the life- and sight-saving potential of Golden Rice. The Philippine regulators absolutely followed the precautionary principle. These experts are very experienced in judging the safety of GMO crops, which are in widespread use in the Philippines and significantly benefit farmers and the environment. Farmers are not stupid; they only buy what they find useful, and no one forces them to purchase anything. They always have a choice, and they choose to buy these commercial products from the biotech firms that produce them.



Dr. Tony Alfonso, former PhilRice chief science research specialist holding about 100 grams of Golden Rice in front of Golden Rice plants at Maligaya, Science City of Munoz, Nueva Ecija

Golden Rice is different. Although its developers must follow the same regulatory rules, the crop is not a “commercial product”: it will cost no more than white rice. The technology has been donated by its creators, professors Ingo Potrykus and Peter Beyer, as an extra intervention to combat vitamin A deficiency. The only difference between Golden Rice and white rice is that the former contains the [golden-colored beta-carotene](#). Beta carotene is ubiquitous in the environment and a diversified diet, and a source of vitamin A. A universal source of vitamin A [will reduce](#) global childhood mortality by 23 – 34%, and up to 50% when it is used to treat measles.

VAD impairs the immune system so that common diseases kill, and it often leads to irreversible blindness. But most people who die of vitamin A deficiency do not become blind first. Globally VAD kills more people than HIV, Tuberculosis or Malaria. It is most prevalent in communities where rice is the staple food and dietary diversity is very restricted, as white rice, though an excellent energy source, contains no minerals or vitamins.

Data, not speculation, show that only 40 grams of dry Golden Rice, cooked and eaten

daily, will save lives and sight, and there is no danger of overdosing. As a beta-carotene delivery technology, Golden Rice is effective in all the public-sector owned rice varieties it has been put into by PhilRice. No commercial company owns any Golden Rice. For the extra beta-carotene nutrition in Golden Rice, there is no added cost to the government, farmers nor consumers. This has been agreed to in writing by the professor-creators of Golden Rice and the Philippine Government. No individual nor organization involved with Golden Rice's development has any financial interest in its success.

The latest data from the Philippines show that, despite increases in the population's wealth, dietary diversity and vitamin-A capsule use, almost 28% of children between six months and one year old are vitamin-A deficient. The World Health Organization lists the prevalence of vitamin A deficiency in Philippine 'pre-school' children as "severe". The latest data also show that 20% of 'pre-school' children are vitamin-A deficient. It is interesting to speculate why there is a reduction of 8% in VAD incidence in 'pre-school' children, compared with those less than a year old: perhaps the older kids have a more diverse diet. Perhaps 8% of them died.

### **Simplified regulations on the horizon**

So, what's in store for Golden Rice following the positive regulatory decision in the Philippines? Fortunately, the government is poised to shepherd Golden Rice all the way to commercialization. The National Economic and Development Authority has recognized agricultural biotechnology as a priority sector. And on January 1, in response to the December 10 Golden Rice regulatory decision, Philippine Congresswoman Sharon Garin said:

This is a victory for science, agriculture, and all Filipinos. It is time that safe and responsible use of biotechnology be included in the Philippine toolkit to meet national development goals.

Garin, who chairs the House of Representatives Committee on Economic Affairs, pushed for the immediate passage of the Modern Biotechnology Act that aims to eliminate the regulatory complications hampering the commercial release of biotechnology products like Golden Rice, mitigate the effects of climate change, promote competitiveness and combat poverty.

Upon enactment of the bill, the Biotechnology Authority of the Philippines shall ensure that the biosafety regulations are science-based and simplified with a product-based and not a process-based approach, which means the characteristics of the end product (not the process that produced it) will be the determining factors in its evaluation.



To promote the responsible use of biotechnology, the bill also proposes the penalization of unauthorized destruction of biotech crops, as well as the sale or distribution of fake genetically modified seeds. A local currency fine equivalent to US \$10,000 and/or imprisonment for two years shall be imposed on individual violators. If the violation is committed by an organization or an institution, a local currency fine equivalent to US \$200,000 and/or suspension of the privilege to operate within the Philippines shall be imposed.

It appears that Congresswoman Garin's support for the Modern Biotechnology Act is making a difference. After reconvening on January 20 after the Christmas break, the House of Representatives moved the legislation one step closer to approval. The Chair of the House panel on Science and Technology, Aristotle Aumentado, said the bill was approved with minor amendments, and will be referred to the House Committee on Appropriations: "Then, after the two panels pass the bill, we will have our committee report and the bill will be reported out to the plenary for its approval," he added.

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In another positive development, on January 25. Dr. Emil Javier, chairman of the Coalition for Agriculture Modernization in the Philippines (CAMP), reported that the trials to investigate the potential environmental risks posed by Golden Rice (completed in September 2019) are being processed for formal submission to the Bureau of Plant Industry.

“I have no doubt that Golden Rice will ultimately pass both the food and environmental safety standards” Javier wrote. He added that the news couldn’t come soon enough, since the Philippines loses the equivalent of US \$4.4 billion annually due to lack of proper nutrition—vitamin A deficiency being the biggest contributor to this deficit, despite current interventions. In closing, Javier also explained that the beta-carotene genes are readily available to rice breeders and will be routinely incorporated into the inbred and hybrid varieties of the future.

### Getting the word out

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (‘Searca’) has also thrown its support behind Golden Rice (GR2E). The Center said it is also boosting support for the country’s biotechnology regulations and policies by opening a program to expand stakeholder knowledge of biotechnology, particularly for policy makers.

“We stand behind products of agribiotechnology that increase agricultural productivity to feed a growing population in the midst of dwindling natural resources and erratic changes in climate,” Searca Director and National Academician Glenn B. Gregorio said. He added that

Due attention must be given to our resource-poor farmers by providing them access to information, best practices, and new technologies that give them a fighting chance to cope with the many challenges they face and to open up better opportunities for them and their families so that they can have better quality lives.

In a further clear endorsement of the government’s commitment, Philippines President Duterte formally presented the Order of National Scientist to “Biotech Champ” Javier in early January, recognizing his commitment to addressing the needs of the poor through modern science, as well as his advocacy concerning biotechnological innovations.



It is easy to underestimate the challenges that lay ahead to get make Golden Rice a reality. Unlike an agronomically improved variety, Golden Rice offers no clear economic benefit for farmers, though no detriment either. So consumer or government demand, or farmer consciousness for better community health, will be necessary to encourage cultivation. Farmers won't grow Golden Rice unless the crop will sell. Multi-stakeholder local education and social marketing are all necessary for GR to become an established food crop.

Perhaps local governments will purchase it to be used in school meal programs, and work to educate children about the benefits of consuming sources of beta-carotene, including Golden Rice. My ['instructions for use'](#) address this local action need, wherever Golden Rice is registered for use. The details of a program leading to adoption need to be designed and led locally in the Philippines. Dr [Javier agrees that](#) even now a vigorous marketing plan should be in place as ultimately the success of the pioneer Golden Rice variety will depend on consumer and farmer acceptance.

When the Asian Institute of Management conducted focus groups in four different agro-ecological and economic zones of the Philippines, they found that focus group members were not put off by the color. Indeed, Golden Rice is a positive identifier, no language required. Growers and communities also said they were prepared to try Golden Rice if it was good for family health and they could afford it, and they will be able to given that it will cost no more than white rice.

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Congresswoman Garin maintains that biotechnology will increase yields and produce better products, leading to more income for farmers. 2015 statistics show that the average poverty incidence in the Philippines is about 21.6 percent, and is highest among farmers at 34.4 percent. The rewards of adoption of Golden Rice promise to be significant and sustainable. Though as [I wrote in 2013](#):

Continuing research will clearly be necessary, after registration, to fully understand the benefits of Golden Rice to public health. Will regular Golden Rice consumption reduce the population's morbidity and mortality associated with vitamin A deficiency as expected, and as it was created to do? Of particular interest are neonates (babies under a month old). Vitamin A capsules are only recommended for children of six months and older, and very young children do not consume solid food. These children are the most vulnerable to vitamin A deficiency: neonate deaths in 2011 accounted for 43 per cent (increased from 36 per cent in 1990) of all deaths among children under five years old.

Can a good source of vitamin A, such as Golden Rice, when part of the staple diet, improve the mother's vitamin A status, benefiting her health, and simultaneously via the placenta and breast milk increase the baby's resistance to disease, and reduce neonate and child mortality?



## Greenpeace's lasting impact

By 2005 "Greenpeace's anti-Golden Rice campaign had been going for five years. The environmental group convinced people and their governments in Asia and Africa that the technology was dangerous to human health and the environment. As a result, an estimated 14 million children have died of Vitamin A deficiency and an estimated 3.5 million to 7 million are permanently blind.



As biologist and physician Henry Miller has written:

A 2012 [Golden Rice] article in the nutrition literature might have been the most momentous contribution to public health worldwide since Dr. Jonas Salk's announcement of the polio vaccine. The operative phrase is might have been, because intimidation, politics and the dishonest, anti-science efforts of NGOs to impugn the research have delayed the translation of its findings to life-saving interventions for millions of children. Why do anti-genetic engineering activists want to save the whales but let children go blind and die?

In his recent 2019 book on Golden Rice, Ed Regis added another stark rebuke : "Abusing people? None of this wild rhetoric [promulgated by Greenpeace is] even remotely true or [makes] any sense..." The real abuser is Greenpeace and its 20-year campaign to convince African and Asian governments that any GMO is dangerous to their people and the environment, denying millions of people life-saving nutrition. Following the December decision of the Philippines concluding that Golden Rice is safe, Sir Richard J. Roberts, the 1993 Nobel Prize Winner in Physiology or Medicine wrote:



On behalf of the 151 Nobel Prize winners and 13,292 co-signers supporting GMOs, we were delighted to hear of the recent announcement of the approval by the Philippine Department of Agriculture to authorize the direct use of Golden Rice as Food and Feed or for Processing (FFP). **I and my colleagues are greatly encouraged by this latest development in the Philippines. It is extremely gratifying to see that science prevails and the regulators have been listening. We applaud this decision and look forward to more good news in the near future.**

Surely the time has come when anti-GMO activists and the green parties should join the Golden Rice developers and others working to improve human nutrition and embrace this humanitarian innovation. GMOs are not dangerous, and the scientific evidence is overwhelming that they are safe.

Sadly, Sir Roberts suggestion remains unanswered. It appears that on the topic of Golden Rice, Greenpeace, in the Philippines at least, remains on the wrong side of humanity, science, public opinion and government policy.

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