



Dr. William D. Dar discussed the 'New Philippine Agriculture Framework' during the DA-BAR 2016-2022 RDE Agenda & Programs (RDEAP) Consultation, at DA-BAR on January 8, 2016.

## InangLupa censures SC decision to ban Bt eggplant

A former agriculture secretary and head of a global agricultural research facility joins the Philippine science community in the condemnation of the recent decision of the Supreme Court (SC) that bans the field testing of the *Bacillus thuringiensis* (Bt) eggplant in the country, and nullifies a related government policy.

"The recent decision of the Supreme Court that bans the field-testing of Bt eggplant and nullifies a related DA Administrative Order is a huge setback in our continuing quest to produce adequate, safer, affordable and nutritious food for millions of Filipinos," said Dr. William D. Dar, currently president of InangLupa Movement and former direc-

tor general of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in India.



"We at InangLupa join the Philippine science community in condemning the Supreme Court decision as it conveys a dampening effect on Filipino crop scientists and researchers, negating their hardwork and dedication. If this continues, the country will not only again expect a brain drain of its experts but will most importantly lose an economic opportunity," said Dr. Dar.

"We consider the SC decision as a setback that the Department of Agriculture and the country's scientific community, including concerned NGOs like InangLupa Movement, should hurdle, and we will support the DA in its move, if any, to lodge before the Supreme Court a motion for reconsideration," he added.

"The debate on genetically modified (GM) crops, such as Bt eggplant, continues not only in the country but worldwide, but we maintain that biotechnology products are founded on science, and

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## Dark day for science

By Mark Lynas

The decision by the Philippines' Supreme Court to uphold the ban on GMO *Bt talong* (eggplant) field trials is a huge disappointment to the scientific community and others pursuing the dream of sustainable and progressive agriculture in this country.

The Court upheld the *Writ of Kalikasan* originally demanded by Greenpeace and other anti-GMO groups in 2012, and backed by the Court of Appeals in 2013. It also struck down the



Department of Agriculture's Administrative Order No. 8-2002, potentially throwing the Philippines' GMO assessment and approvals system into unnecessary chaos.

The competence of the Court to adjudicate on matters of law is not in question.

However, its judgment that the science on the question of *Bt talong* and GMOs in general is not settled appears highly skewed and very dependent on biased assessments submitted by Greenpeace and other groups with an overt anti-science agenda.

In effect, the Court has decided that Greenpeace and its fellow activists are more competent to pronounce on scientific matters than the Philippines' National Academy of Science and Technology (NAST), the University of the Philippines Los Baños (UPLB) and the departments of agriculture (DA), and of environment and natural resources (DENR). This is highly irregular, to say the least.

The ruling seems particularly bizarre given the shoddy evidence Greenpeace submitted in its original petition against *Bt talong*. Most of Greenpeace's evidence was never published in scientific journals. Instead, it was commissioned and paid for by Greenpeace to serve its ideological battle against modern biotechnology.

In particular, a Greenpeace-funded study by a French anti-GMO academic, Giles-Eric Seralini, was a central component of evidence submitted to the Supreme Court. This asserted that *Bt talong*

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## DA-BSWM leads SLM vs. drought

The Department of Agriculture's Bureau of Soils and Water Management (DA-BSWM), along with four concerned government agencies, will implement a Sustainable Land Management (SLM) program to address land degradation and mitigate effects of drought, in partnership with the United Nations Development Program (UNDP).

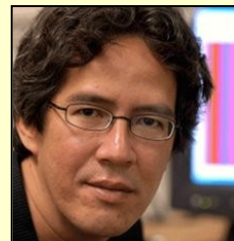
BSWM director Silvino Q. Tejada, who also serves as SLM program leader, said the SLM aims to address land degradation due to various human activities and inappropriate agricultural practices, which is one of the country's major agricultural and environmental problems.

He said the DA-BSWM and UNDP will implement the SLM program — which aims to achieve effective cross-sectoral national and local environment, and promote integrated landscape manage-

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## SC kills Bt talong, takes down Phl science

By Dr. Michael Purugganan



"No consensus on safety," says the headline as news outlets reported yesterday that the Supreme Court has banned field trials for *Bt talong*, a GMO eggplant developed to resist pests.

I have no words. But as a scientist and as a plant biologist, I have to speak up.

There is clear consensus! Ask the various national academies of science around the world, or the various independent scientific professional societies. They have concluded that GMO technology is safe.

An Italian research in 2014 published a major review of 1,783 research papers, reports and other material on GMO safety in the journal *Critical Review of Biotechnology*. They found "little to no evidence" that GMO crops had a negative

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# A misapplication of the *Writ of Kalikasan*\*

By Dr. Emil Q. Javier

(\*Editor's note: This commentary was published in three parts by the Manila Bulletin in Dec. 19 and 26, 2015, and in Jan. 2, 2016. Due to limited space, we took the liberty of editing and simplifying it. To read the full commentary, please visit: [www.mb.com.ph/a-misapplication-of-the-writ-of-kalikasan](http://www.mb.com.ph/a-misapplication-of-the-writ-of-kalikasan).)

The Supreme Court (SC) decision to permanently halt the field testing of the genetically-modified *Bacillus thuringiensis* (Bt) eggplant developed by the Institute of Plant Breeding (IPB) at UP Los Baños (UPLB) was a huge letdown for the Philippine science community.

We are not world leaders in science, and there are only a few fields of science where we are able to keep pace with the rest of the world. The SC unwittingly denied us even that little space.

The real losers are the poor farmers and the consuming public.

Our small farmers are deprived of modern means of raising productivity, competitiveness and incomes. They are denied potential sustainable farming technologies that can substantially reduce the need for harmful pesticides to protect their crops. And they are prevented from having access to more climate-resilient crops, which can tolerate drought, temporary inundation and salt-intrusion.

The big losers as well are the low-wage-income consumers, who are penalized with high food prices and pesticide residues in the food they eat. Likewise, the poor and malnourished are deprived of the benefit of improved nutrition at no extra cost — e.g. Vitamin A -fortified rice (the *Golden Rice*).

All of these because of an unfortunate misapplication of the *Writ of Kalikasan*, a legal remedy under Philippine law which protects the rights of Filipinos to a balanced and healthful ecology.

Eggplant is a popular vegetable among Asians, including us Filipinos. However, it is very susceptible to the fruit and shoot borer (FSB) insect, which kills the plants and renders the fruits inedible and non-marketable. The insect pest is so pernicious that farmers often have to throw away 50 to 70% of their harvest.

In order to protect eggplant crops, farmers resort to chemical pesticides. Infestation is so bad that many farmers had to spray every other day. The more desperate ones dip eggplant fruit in chemicals.

The Bt eggplant which has built-in resistance to the FSB was intended to replace the chemical spray technology, which Filipino farmers currently employ.

Ironically, our Courts have declared “the Bt eggplant technology as constituting a grave and present danger (and an assault on) the Filipinos’ constitutional right to balanced and healthful ecology.”

## Quaint theory on balanced ecology

The Court of Appeals which issued the restraining order justified its original ruling that the Bt eggplant deprives Filipinos of their right to a balanced ecology on the theory that introducing a genetically-modified plant into our ecosystem is an “ecologically imbalancing act.”

The exact wordings as reproduced in the SC decision are:

“...there is a perfect and sound balance of our biodiversity as created or brought about by God out of His infinite and abso-

lute wisdom. In other words, every living creature has been in existence or has come into being for a purpose. So we humans are not supposed to tamper with any one element in this swirl of interrelationships among living things in our ecosystems.

...Bt talong is a technology involving the deliberate alteration of an otherwise natural state of affairs... It is a deliberate genetic construction of the eggplant to alter its natural order which is meant to eliminate one feeder (the borer) in order to give undue advantage to another feeder (the humans).

...Consequently, the testing or introduction of Bt talong into the Philippines, by its nature and intent, is a grave and present danger to (and an assault on) the Filipinos’ constitutional right to a balanced ecology, because in any book and by any yardstick, it is an ecologically unbalancing event or phenomenon.”

The absurdity of this quaint theory of the right to a balanced ecology should be obvious to any serious student of science and biology. The whole of civilization, the business of agriculture and the practice of medicine are precisely premised on altering/tilting/modifying the balance of nature to suit man’s needs and purposes.

The use of human labor or tractors to cultivate the fields are intended to suppress the weeds, which compete with crops for water, soil nutrients and sunlight. We spray biological agents, organic as well as synthetic pesticides, on our crops to eliminate insects and diseases. We apply ointments, inject vaccines, take medicines and irradiate ourselves to rid our bodies of parasites, fungi, bacteria and viruses, which imperil our health.

By this absurd theory of balanced ecology, which the SC has adopted, the whole of agriculture and the practice of medicine — which by their very nature alter the state of natural affairs to help man acquire food, fiber and shelter, and protect our bodies from infections and infestations — will have to be banned by application of the *Writ of Kalikasan*.

## Part 2

### The right to a healthful ecology

Specifically, the question the SC had been asked to resolve was whether the consumption of Bt eggplant is potentially harmful to the health of Filipinos.

The Bt eggplant is identical with the conventional eggplant, except for the artificial introduction of a gene from the bacterium *Bacillus thuringiensis* or Bt, which enables the eggplant to synthesize a class of proteins called *Cry1A*, which are toxic to the eggplant fruit and shoot borer (FSB), and other insects belonging to the order *Lepidoptera* (commonly referred to as butterflies).

The *Cry1A* proteins, while toxic to butterflies, are harmless to human beings, mammals and insects like beetles, flies and mosquitoes.

They are benign to man for two reasons: *Cry1A* toxins require an alkaline environment; and they are immediately de-



A distinguished plant breeder and geneticist, Dr. Emil Q. Javier is the 17<sup>th</sup> president of the University of the Philippines (1993-99). He is a member of the National Academy of Science and Technology (NAST) and heads the Coalition for Agriculture Modernization in the Philippines (CAMP). For feedback, kindly email Dr Javier: [ejjavier@yahoo.com](mailto:ejjavier@yahoo.com).

natured and digested into their harmless component amino acids by the acidic gastric juices in our stomachs.

For the *Cry1A* to be effective, they have to be recognized by molecular receptors called *cadherins* found in the gut of susceptible insects. These receptors are not found in the human intestine. Thus, *Cry 1A* toxins are not harmful to people.

There is nothing sinister about *Bacillus thuringiensis*, a common soil bacterium. Its insecticidal properties were first recognized by Japanese scientists in 1901. Large scale commercial production of Bt insecticide spray commenced in the US in 1958.

Rachel Carson, in her novel “*Silent Spring*,” recommended Bt as a biological pesticide as it has lesser environment impact than conventional chemical pesticides.

The biochemistry and mode of action of *Cry 1A* toxins preclude threat to human beings. Therefore, the three conditions which justify the application of the precautionary principle — notions of uncertainty, possibility of irreversible harm, and possibility of serious harm — do not apply.

Thus, on substantive scientific grounds to declare that the introduction of Bt eggplant is a grave and present danger to (and an assault on) the Filipinos’ constitutional right to a balanced and healthful ecology taxes the imagination. The only way to make the decision look logical is to demand absolute certainty, a standard of proof so high that it is irrational.

### State of imminent calamity

The SC decision also declared the Department of Agriculture (DA) Administrative Order (AO) No. 8, Series of 2002 — which provides the rules and regulations for the importation and release into the environment of plants and plant products derived from the use of modern biotechnology — as null and void.

The Court found DA-AO 8 inadequate on procedural grounds and consequently temporarily enjoined any application for contained use, field testing, propagation and commercialization and importation of genetically modified organisms (GMOs) until a new administrative order is promulgated in accordance with law.

This second part of the SC decision has disastrous immediate consequences on our food security — as there is no longer a



valid basis for importing GMO soybean meal, which constitutes a significant part of commercial feeds for pigs, chickens and cows. Unfortunately, all the soybeans in the United States and Argentina, where we import soybean meal, are genetically-modified.

Likewise, our corn farmers are no longer allowed to plant GMO hybrid yellow corn, which is high-yielding and profitable. Last year, our farmers raised 830,000 hectares of GMO corn hybrids bioengineered with the same *Bt* gene bred into *Bt* eggplant to protect the corn plants from the dreaded Asiatic corn borer insect. So, in addition to soybean meal, the livestock sector must also find alternative sources of feed corn to replace the estimated 3.5 million tons of domestic GMO feed corn.

If the SC decision were immediately executory, it will be goodbye for the country's poultry and livestock sector. What will be left are the organic free-range chickens and the backyard native pigs fed with kitchen slops, coconut and occasional sweet potatoes and banana stalks.

With the most severe *El Niño* on record in progress, affecting agriculture in most parts of the world, most agricultural commodities shall be in short supply. This early President Aquino should declare a state of imminent (food insecurity) calamity, like what Governor Joey Salceda did for Albay before *Typhoon Nona*.

This must be giving fits to poor Agriculture Secretary Proceso Alcala, who is an advocate of the recent law on organic farming which forbids use of GMO crops.

Nevertheless, this temporary injunction leaves a slight opening at the doors of the departments of agriculture (DA), environment and natural resources (DENR), health (DoH), interior and local government (DILG) and science and technology (DOST) to put their acts together in a joint memorandum order/circular to cover all the procedural aspects in the disposition of matters regarding GMO crops.

Likewise, it is an opportune time for Congress to enact a legislation — “to specifically address the concern for biosafety arising from the use of modern biotechnology which is deemed necessary to provide more permanent rules, institutions, and funding to adequately deal with this challenge.”

However, with elections coming and Congress busy with many other important national issues like BBL, charter change, federalism and taxes, the earliest a GMO law can be crafted could very well be in late 2017.

### Neither an endorsement nor repudiation

Supreme Court associate justice Marvic Leonen articulated that “. . . *The results of this case are neither an endorsement nor a repudiation of genetically modified ingredients, processes and food products.*”

In an admirable display of judicial restraint, he added “. . . *We also need to be careful that the chambers of this Court do not substitute for the needed political debate or the analytical rigor required by truths in science.*”

Part 3

### Unwarranted application

The application of the *Writ of Kalikasan* on the conduct of field testing of *Bt* eggplant was unwarranted both on procedural and substantive grounds.

Associate justice Leonen in his concurring majority opinion pointed out that the petition for the writ should have been dismissed and considered moot and aca-

dem. The two-year permits for the *Bt talong* field tests were about to expire, and the field tests themselves have been completed. There was therefore, according to Justice Leonen, grave abuse of discretion which amounts to excess of jurisdiction on the part of the Court of Appeals.

In fact, he chided Greenpeace and the other respondents: “. . . *Environmental advocacy also requires as understanding of science and locating of the proper place of various norms such as the precautionary principle. . . Filing a judicial remedy about two years late and without the required scientific rigor required by the allegations and the arguments misses these standards.*”

For the Courts to conclude “*that the testing and introduction of Bt talong by its nature and interest is a grave and present danger (and an assault on) the Filipinos' right to a balanced ecology because the genetic construction of the Bt talong is meant to eliminate one feeder (the borer) in order to give undue advantage (the humans)*” is very naïve to say the least.

All of agriculture and medicine are meant to alter/tilt/modify the balance of nature in favor of man's needs and purposes against other living things (the weeds, insects, other pests, parasites, fungi, bacteria and viruses) which attack crops, livestock and man's own person.

By this interpretation of the *Writ of Kalikasan*, the business of agriculture and practice of medicine will have to be forbidden.

This quaint theory of balanced ecology misses the point that the balance in nature is not static but dynamic and constantly changing. Changes in the environment whether natural or man-made alter/modify the natural order of things and the various components of the ecological systems accordingly respond/react to attain a new equilibrium. Species continually evolve and new species come into being as others less environmentally fit become extinct.

Actually, the greatest threat to biodiversity is the loss of habitat due to conversion of forestlands, savannahs and mangroves into farmlands, forest plantations and fishponds. Thus, the best way to conserve biodiversity in addition to seed cold stores and gene banks (*ex situ* conservation) is by way of protected areas (*in situ* conservation), the many NIPAS under the jurisdiction of the DENR where all man's interventions are excluded.

In corollary, it is also best to sustainably optimize production from existing farmlands, forest plantations and fish ponds to obviate demand for further clearing of natural habitats.

Between *Bt talong* and chemical pesticides used to control the eggplant FSB, the *Bt* technology ought to be safer and more profitable to small farmers.

### Scientific consensus: GM crops are safe

Since the Greenpeace petition against *Bt talong* field trials is moot and academic, the SC declared the DA-AO No. 8 as null and void. It said “. . . *There exists a preponderance of evidence that the release of GMOs into the environment threatens to damage our ecosystems, and not just the field trials, and eventually the health of our people. . .*”

This is where the SC grievously erred. There is no unanimity, but there is broad global scientific consensus on the safety of GMO crops.

The following prestigious international and national scientific bodies have en-

dorsed that GMO crops as are safe as conventional products, namely the: World Health Organization; National Academies of Science (USA); The Royal Society (United Kingdom); European Food Safety Authority; American Association of the Advancement of Science; American Medical Association; Chinese Academy of Sciences; Brazilian Academy of Sciences; Indian National Science Academy; Mexican Academy of Sciences; and Third World Academy of Sciences.

In contrast, no respectable national academy of science has expressed objection to GMO crops.

Unfortunately, the SC gave more credence to the anti-GMO concerned scientists cited by Greenpeace, who are a distinct albeit loud, fear-mongering minority.

Even in the European Union, where many countries have imposed a moratorium on the planting of GMO crops (but not importation and consumption) their chief scientific advisor Dr. Anne Glover had these very forceful words to say: “. . . *There is no substantiated case of any adverse impact on human health, animal health or environmental health, so that's pretty robust evidence, and I would be confident in saying that there is no more risk in eating GMO food than eating conventionally-farmed food.*”

### US scientists say GM food is safe

In January 2015, the Pew Research Center in collaboration with the American Association for the Advancement of Science (AAAS) released the findings of a survey of US adult citizens and US-based members of AAAS that showed an overwhelming majority (88%) of scientists agreed that GM foods are generally safe. In contrast, only 37% of the American public believe GM foods are safe.

The Pew Research Center is an independent, non-profit, non-governmental organization—whose environment portfolio includes saving the natural environment and protecting the rich array of life it supports; while the AAAS, established in the US in 1848, is the world's largest general scientific society and publishes the highly regarded journal “*Science*.” It had 126,995 members in 2008.

The US is not the universe, but if 88% of their scientists surveyed belonging to the AAAS agree that GM crops are safe, that's about as close as we can get to a scientific consensus. ###



**Dr. Dar receives a plaque of appreciation from BAR Asst Dir. Teodoro Solsoloy during the DA-BAR 2016-2022 RDE Agenda & Programs Consultation, on January 8, 2016.**

# SC's Bt eggplant decision explained

By **Elpidio V. Peria**

Contrary to former UP President Dr. Emil Javier's view, describing the Supreme Court's decision on Bt Talong) as a misapplication of the *Writ of Kalikasan*, I would state that it is but a proper application of the said Writ.

To my scientist-friends, who characterized the decision as anti-science, I would say not really. The SC decision attempted to grasp the technical complexities and implications of genetically-engineered plants and food to human health and the environment. The SC took the path of caution, and the Bt eggplant proponents and scientists at the Court of Appeals and SC hearings were not able to answer clearly and definitively the question whether "there is no full scientific certainty that the Bt eggplant does not cause any harm pertaining to health" and that "we cannot really say that Bt Talong is perfectly safe for human consumption."

Even the assertion of one expert witness of the Bt eggplant proponents that "there is no evidence of harm" that was presented by the anti-Bt eggplant advocates, the Court merely responded to her: "that is your opinion."

The proponents' witnesses confirmed in the minds of the both the CA and SC justices, who were encountering the issues concerning genetic engineering technology for the first time, that the Bt technology is something that the Philippines should be very careful about, considering there is no clear consensus on the safety of the Bt eggplant to humans and the environment.

The SC ruled that the "divergent views of local scientists reflect the continuing international debate on GMOs and the varying degrees of acceptance of GM technology by states especially in the developed countries (USA, EU, Japan, China, Australia, etc.)."

SC associate justice Marvic Leonen, in his concurring opinion, characterized the decision as "neither an endorsement nor a repudiation of genetically modified ingredients, processes and food products."

The SC decision was based mainly on the Court's finding of lack of full scientific certainty on the human health and environmental implications of Bt eggplant.

The SC merely reiterated the primacy of the Constitutional right to health and right to healthful ecology of the environmental group Greenpeace and the farmers' group MASIPAG and their supporters who filed the suit.

What further killed the case for Bt eggplant proponents was when the Environmental Management Bureau (EMB) witness, lawyer Atty. Segui, admitted during the CA hearing that there was actually no capacity and budget within the EMB to conduct the environmental impact assessment of Bt eggplant.

The nail in the coffin for the proponents was the issue of whether the DA Administrative Order 08-2002 was adequate.

The SC tested DAO 08-2002 against Executive Order (EO) 514, the National Biosafety Framework (NBF) of the Philippines. The SC found DAO 08-2002 deficient in terms of issuing joint guidelines with the appropriate agency on the conduct of environmental impact assessment of Bt eggplants, and in the proper conduct of public participation.

The SC said EO 514 clearly mandates that concerned departments and agen-

*Editor's note: To balance our special report on the Supreme Court's decision on Bt eggplant, we are also reprinting the commentary of Atty. Elpidio V. Peria, which we also edited and excerpted due to limited space. Peria serves as legal adviser at the DENR's Protected Areas and Wildlife Bureau, and lead convenor of Aksyon Klima Pilipinas, a national network of civil society organizations working on issues concerning climate change.*

cies, most particularly petitioners DENR-EMB, BPI and FPA, make a determination whether the EIS system (where the proponent will have to do an environmental impact assessment or EIA) should apply to the release of GMOs into the environment and issue joint guidelines on the matter.

The SC also added that even if that mandate from the NBF to do EIA did not exist, the existing regulations on the conduct of EIA by the DENR-EMB would still apply as Bt eggplants can be classified as "new and emerging technologies."

There is a long-pending draft EIA regulation that was designed by the DENR through the Protected Areas and Wildlife Bureau (now the Biodiversity Management Bureau) and tailor-fit for GM products that was ignored by the DA for many years, dating back in 2005 or earlier. Had the DA adopted that measure and integrated it, or even modifying it, as an accompanying regulation of DAO 08-2002, then they would have something to show before the CA that the environmental concerns were taken into account.

As to the matter of public participation, the SC found that the "petitioners simply adhered to the procedures laid down by DAO 08-2002, and no real effort was made to operationalize the principles of the NBF in the conduct of field testing of Bt talong."

It was on these grounds that the SC declared DAO 08-2002 as null and void.

The SC said the proponents should have conducted "a more transparent, meaningful and participatory public consultation on the conduct of field trials beyond the posting and publication of notices and information sheets, consultations with some residents and government officials, and submission of written comments, provided by DAO 08-2002."

Justice Marvic Leonen, in his concurring opinion, detailed the defects of the public participation requirement outlined in DAO 08-2002:

a) The applicant chooses the members of the Institutional Biosafety Committee (IBC), the entity that initially screens the application for GMO field trial, and this is problematic because the applicant does not have any incentive to choose the critical community representatives. The tendency would be to choose those whose dissenting voices are tolerable;

b) The National Committee on Biosafety of the Philippines, apart from not being a sufficient oversight for people's participation, is a government body. A government body is not the community that should supposedly be represented in the IBC;

c) The posting in the Public Information Sheet in three conspicuous places near the field testing site is not enough to raise awareness regarding the field testing being applied for. The subject matter in transgenic transformation is too complex and its consequences too pervasive as to simply leave this through the fictional notice of public posting;

d) There was also a requirement for posting on the internet to capture the attention of

relevant stakeholders; this was not required by DAO 08-2002;

e) The mechanism under DAO 08-2002 does not even require that local government authorities be apprised about the proposed field testing. Certainly, engaging local government authorities invites more meaningful public discourse.

f) The Scientific and Technical Review Panel, a group of 3 independent scientists that reviews the risk assessment conducted by the IBC does not have a community representative. It is also tasked to evaluate, based on the individual scientist's own standards, whether the proposed field testing poses significant risks on human health and the environment. How the points raised during the mandatory public hearings will be considered in the issuance of the field testing permits is not covered by DAO 08-2002. In this regard, there is no standard or process;

g) The nonchalant attitude of the regulatory framework is best seen when petitioners alleged there was some public consultation prior to field testing. These consultations, however, were not documented. The only proof of it was a bare allegation in the affidavit of one witness of the DA in her affidavit.

h) The absence of an effective mechanism for public feedback during the application process for field testing means the administrative order failed in meeting the public participation requirement of the Cartagena Protocol;

i) The insouciant approach to public participation during the application process is obvious as there is no appeal procedure for third parties. The administrative regulation only deals with appeals by any person whose permit has been revoked or has been denied a permit or whose petition for delisting has been denied by the Director of the Bureau of Plant Industry.

In this final omission, Justice Leonen said that procedural due process is taken away from the public.

In conclusion, the imperatives of an appropriate biosafety policy for Bt eggplants and similar crops in the Philippines was best summed up by Dr. Ben Malayang, one of the experts for the Bt eggplant oppositors at CA hearings and a member of the National Committee on Biosafety of the Philippines, who said:

*"... introducing Bt Talong in the Philippines must be decided on the grounds of both science and public policy, and public policy, in this case, must involve full disclosure and participation in accepting both the potential gains and possible pains of Bt Talong. The stakes, both positive and negative, are so high that I believe Bt Talong would require more public scrutiny and wide decision making beyond the [realm] of science... for the sake of our country and our rich biodiversity ... prudence requires that maximum efforts be exerted to ensure its safety beyond the parameters of science and into the sphere of public policy."*

The most honorable thing that the proponents of Bt talong and those who designed and promoted DAO 08-2002 is to resign their present positions in the National Committee on Biosafety of the Philippines.

They should be humble enough to say they are mistaken, and be open to suggestions identified by the SC so that the process of rebuilding anew the Philippine regulatory framework on GMOs via legislation would have a fresh start, with new people that are serious in learning from this decision.

The scientists who deal with GMO regulations and the public should take this advice from the SC: "There can be no argument that "since scientific advice plays a key role in GMO regulations, scientists have a responsibility to address and communicate uncertainty to policy makers and the public."



# SC erred in applying precautionary principle on *Bt talong*

By Dr. Eufemio T Rasco, Jr.

The Supreme Court (SC) decision declaring field experiments on *Bt talong* permanently enjoined was justified on the basis of the “precautionary principle”.

The precautionary principle says that “where there are potential adverse effects (of a technology), lack of full scientific certainty shall not be used as a reason for postponing appropriate measures to prevent environmental degradation.”

This principle is recognized both by international conventions, where the Philippines is a signatory; and by EO 514, an Executive Order issued by former president Arroyo. Thus, the use of the precautionary principle is deemed a legal matter, and well within the scope of work of the judiciary.

*Bt talong* refers to eggplant that has been genetically modified to control the fruit and shoot borer, an insect pest that can cause more than 80% economic loss to farmers. Researchers on *Bt talong* from the UP Los Banos have experimentally demonstrated that it is effective, and the use of this technology can dramatically reduce the current use of toxic chemical insecticides. The safety of *Bt talong* is strongly supported by experimental and other evidences.

## Greenpeace contention

However, critics led by Greenpeace argued that *Bt talong* can cause adverse effects to the environment, also citing evidence from various sources. This conflict of opinion created a scenario of uncertainty, that, along with the claim of “potential adverse effects” constitute the conditions for application of the precautionary principle.

The SC necessarily had to accept, too, that *Bt talong* can cause potential adverse effects, before it could decide to apply the precautionary principle in the case of *Bt talong*. However, potential

adverse effect is a judgment that requires evaluating scientific evidence. While it may be correct to use the precautionary principle, because it is what the law says, deciding whether a technology should be covered by the precautionary principle is another matter. While all technologies have elements of risk, not all of them may be banned on the basis of the precautionary principle.

Did the SC err in judging *Bt talong* to have potential for adverse effects and therefore, should be covered by the precautionary principle?

To answer this question, one must apply standards.

There are two standards to choose from: absolute safety and relative safety.

The standard accepted by all regulations on plant genetic engineering, including the Philippines’, is relative safety. Absolute safety is impossible to achieve for *Bt talong* or any technology for that matter.

Establishing absolutely safety means proving that harm does not exist, and the scientific method is not adequate for this task. If absolute safety will be used as the standard by the courts, no technology will pass judicial challenge.

## Relative Safety

Simply stated, the concept of relative safety means that a new technology must not be more risky than the old technology it is trying to replace.

Since the decision of the SC did not show any evaluation of the “old technology” being replaced by *Bt talong*, its judgment of the relative safety of *Bt talong* can be challenged for lack of rigor, leading to injustice, or worse willfully exposing farmers and consumers to greater risks from the old technology by banning a safer new technology. (Is the latter a criminal offense? Let the courts decide!)



Dr. Rasco is the former Exec. Dir. of DA Philippine Rice Research Institute. He is a plant breeder and academician, National Academy of Science and Technology of the Philippines.

What are the “old technologies” in question? One is the natural defense mechanisms of the eggplant. The SC should have compared *Bt talong* with these. Like all plants, eggplant cannot run away from its enemies, so it resorts to intimidation and chemical warfare. The “natural” eggplant intimidates its enemies with its thorns, and kills those who cannot be intimidated by poisoning.

Thorns and glycoalkaloids, the weapons in question, are not known to be very selective. For the natural eggplant, humans are enemies because they eat their babies (the seeds of eggplant). Fortunately, most varieties of cultivated eggplant do not have these weapons anymore. Farmers and plant breeders eliminated these weapons by breeding and selection because they cause hazards to farmers and consumers alike. This is the reason why farmers now have to use synthetic chemical pesticides to protect the eggplant from insect pests.

## Comparison with chemicals

The SC also failed to compare the safety of synthetic chemical pesticides with *Bt talong*. What do synthetic chemicals do to other forms of life in the farm? How toxic are they to humans?

The *Bt talong* is an attempt to use a natural defense mechanism, but selectively. The idea is to prevent collateral damage by targeting only the pest; not humans or other forms of life. However, like other “natural” defense mechanisms, the *Bt* eggplant is not perfect. If one is really determined to show it can do harm, there is likely to be something that it can harm, in addition to the pest itself. One can easily demonstrate harm in the lab, even with perfectly harmless stuff, simply by giving high doses or longer exposures. Think of table salt, which can kill at high dosage, or ice, which can kill with prolonged exposure.

The safety of *Bt* eggplant should have been evaluated in comparison with alternatives, which are also imperfect. The fact that the SC did not perform this evaluation before judging that *Bt* eggplant should be covered by the precautionary principle, is a good reason why it should reconsider its decision.

There is no doubt, considering the wisdom of the SC, that if it attempted to do the relative safety evaluation and found that information is insufficient, it would have ordered additional field trials instead of “permanently enjoining” these. ([Rappler.com](http://Rappler.com))



Dr. Dar (right) is shown with Pampanga State Agricultural University President Honorio Soriano, Jr. (middle) and Minister of Agriculture of Fiji Honorable Mr. Inia B. Seruiratu during the Philippine Association of Agriculturists- Central Luzon Chapter Conference at PSAU, Magalang, Pampanga, on January 13-14, 2016.



## SC kills BT... (from page 1)

impact on the environment.

In a review of European Union-funded research on GMO safety conducted between 2001-2010, the European Commission concluded that there is "no scientific evidence associating GMOs with higher risks for the environment or for food and feed safety than conventional plants and organisms." The EU Science Adviser Anne Glover declared publicly that GMO crops are safe – and was fired last year in part because she dared tell the world what the scientific community had concluded.

What the SC ruling stops is work by UPLB scientists who engineered the Bt protein into eggplant, rendering it immune to the ravages of insect pests.

Bt is so safe, even the organic farming community certifies it can be used as a spray in organic farms. Bt corn, soybean and cotton have been grown since the mid 1990s in the US and elsewhere over tens of millions of hectares. There has been no scientifically credible evidence that growing these Bt crops over the last decade has had a substantial environmental impact. And because of the introduction of Bt crops, insecticide use has been lowered in farms that carry these GMO crops, reducing the exposure of farmers and consumers to synthetic insecticides.

But there is a larger context to this issue that strikes at the heart of our ability as a nation to harness modern technology for our own needs.

In this one ruling, the Supreme Court just declared that the Philippines should no longer invest in this technology. They have set a high bar for allowing GMO trials by our scientists, a bar so high that no one can reasonably overcome the legal obstacles they have put in place.

### Shackled scientists

The SC has just halted a major avenue for scientific research in our country, and has ceded future agricultural progress to the developed world, to China, or other countries that are using this technology to develop the next generation of crops.

This SC ruling guarantees we will never be able to develop this technology for our own country. In 5-15 years, when it becomes clear that GMOs are the key to feeding the world, we will have to depend on other countries to provide the technology because we prevented our own scientists from working it out.

Remember whom this decision affects. The big agricultural companies such as Monsanto will continue to work on GMO crops in their US labs, where there is no restriction on their work. This ruling affects our own Filipino scientists, those who have been working hard to develop biotechnology as one of the tools we can use to help our own farmers. The ones who are now shackled are the scientists at UP Los Baños, or PhilRice, or those hardworking researchers at any other agricultural laboratories in the country.

In the next decade, our country will face enormous challenges. Our population continues to rise and we continue to need to import food because our farms do not have the yields that allow them to feed everyone in the country. Climate change is altering weather patterns, and we also urgently need to develop new crops that can withstand drought, salt water, or even flooding.

GMO crops provide a potential safe and targeted way to help our farmers feed ourselves. It is not the only answer to our food security issues, but every major agricultural scientist agrees that GMOs will be an important tool in helping feed our country (or the world, for that matter).

This Supreme Court ruling has just decreed that, when we find out we need it the most, our own scientists will be unable to use this technology to bring new crops to the field. At that future day, not long in coming, we will find ourselves completely at the mercy of the big agricultural companies who have continued to work this technology out in their corporate labs.

Our scientists had a chance to work with this technology and help develop crops made by Filipinos, for Filipinos. The SC, metaphorically, just shut down their labs. **(Rappler.com)**

Dr. Michael D. Purugganan is a Filipino scientist, and is the Silver Professor of Biology and the Dean of Science at New York University.



*Dr. Dar receives from Dr Rey Ebor, Executive Director of PCAARRD a certificate naming the W.D.Dar Room at PCAARRD, Los Baños, Laguna in recognition of "his exemplary leadership and as source of pride for the National Agricultural Research System "*

## Phl imports of GM crops soar to \$784M

The Supreme Court (SC) may have banned the completion of the already completed field trials of *Bacillus thuringiensis* (Bt) eggplant but will it ban the importation of genetically-modified (GM) crops from the United States?

Commercializing Bt eggplant would have been a first in Southeast Asia, where farmers lose between 70 percent and 80 percent of their crops due to fruit and stem borers.

With Bt eggplant, a toxin that kills such borers is produced on the rind or skin, killing them quickly without any impact on humans who consume the vegetable.

The question has arisen following the disclosure by the Global Agricultural Information Network (Gain) of the US Department of Agriculture-Foreign Agricultural Service (USDA-FAS) last year that the Philippines imported \$784 million in GM crops and their byproducts from the US in 2014.

In fact, wrote Perfecto Corpuz of the USDA, the total import value was 2 percent higher than the \$767 million tallied in 2013.

Corpuz listed the import values for 2014 as follows: Soybean meal, \$590 million; feed and fodder, \$39.4 million; soybeans, \$56 million; sweeteners, \$73.5 million; coarse grains, \$700,000; vegetable oil (excluding soybean oil group), \$7.7 million; cotton, \$16.5 million, and soybean oil, \$300,000.

Moreover, while the SC has banned the field testing of Bt eggplant and scrapped Department of Agriculture Administrative Order No. 08, series 2002 that covers the tests, assessment, approval and commercialization of GM crops, Corpuz said Vietnam has approved GM corn last year and Indonesia is set to follow as regards GM corn and GM sugarcane.

GM crops supporters like the Institute of Plant Breeding at the University of the Philippines at Los Baños (UPLB-IPB) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (Searca), which is crafting a food security program for the country and the other members of the Association of Southeast Asian Nations (Asean), said Bangladesh had already commercialized Bt eggplant as a food security measure. **(By Marvyn N. Benaning)**



*Dr. Dar visits a farm in Bharat, Umingan, Pangasinan, where farmers plant hybrid corn in partnership with Prasad Seeds Philippines*



*BSWM leads... (from page 1)*

ment — in partnership with the Department of Environment and Natural Resources-Forest Management Bureau (DENR-FMB), Housing and Land Use Regulatory Board (HLURB), Department of Agrarian Reform (DAR), and National Commission on Indigenous Peoples (NCIP). The program was formally launched on August 26, 2015.

He said soil degradation and drought not only affect sustainable agriculture and food security in tropical countries like the Philippines, where soils are more prone to degradation because of prevalent climatic condition, but also pose major threat to the economic growth of the country, as 35% of the labor force is dependent on agriculture. The increased economic value of improved landscapes would contribute to poverty reduction among small farmers, particularly those in upland areas.

Tejada said 33 million hectares or 45% of arable lands in the Philippines are affected by soil degradation, making them less productive. SLM will improve the conservation of cultivated areas in the uplands and the protection of critical slopes of the watersheds.

He said the participation and support of the UNDP, DENR-FMB, DAR, NCIP and HLURB is a great help to increase the productivity of agricultural lands, achieve food security and provide livelihood opportunities to farmers, while addressing the global concerns of land degradation and climate change.

The SLM program with be implemented through local government units (LGUs) to reduce and prevent incidence of land degradation in vulnerable ecosystems. The DA-BSWM, UNDP and other concerned agencies will establish SLM demonstration sites, where farmers will learn to adopt soil and water resources conservation practices to improve their crop production and income.

He said the program will require concerted, more focused and strategic efforts among concerned agencies, LGUs, farmers' groups and other stakeholders, and require continuous dialogues among upland farmers and indigenous peoples to push the SLM agenda, and make a difference in their lives.

## BSWM grants Cordillera farmers composting facilities

The Department of Agriculture's Bureau of Soils and Water Management (DA-BSWM) through the National Organic Agriculture Program started the year with a turn-over of eight small-scale composting facilities (SSCFs) to farmer-beneficiaries from Benguet, Mountain Province and Ifugao, coinciding with the awarding of composting facility for biodegradable wastes to Benguet Agri-Pinoy Trading Center (BAPTC), held at Camp John Hay, Baguio City, on January 15, 2016.

Director Silvino Q. Tejada said the BSWM, as one of the main implementing agencies of the DA's National Organic Agriculture Program (NOAP), provides farmers SSCFs like shredders to enable them to commercially produce organic fertilizers, and further boost organic farming in the country. The NOAP aims to increase the practice of organic farming to at least five percent of the country's total agricultural land area.

Tejada said adopting organic agriculture improves soil quality and biodiversity, helps address land degradation as organic matter increases the resilience of soils to water stress and nutrient loss. He said organic farming will be vigorously promoted nationwide by the BSWM and other DA regional field units, and concerned bureaus and agencies in part-

"It is our call to save our soils and make an effort to attain sustainable agriculture in our country. Our convergence with all stakeholders to address the alarming threats being brought by drought and land degradation, and continuous monitoring of this project is expected to make a positive impact on our agricultural sector," Tejada concluded. (Loraine D. Cerillo, DA-BSWM)



*BSWM Assistant Director Sonia M. Salguero (middle, with sunglasses) is shown with farmer-recipients of the agency's small-scale composting facilities (SSCFs), mainly shredders (foreground), from Benguet, Mountain Province and Ifugao, in simple ceremonies, at Camp John Hay, Baguio City, on January 15, 2016.*

nerships with farmers' groups, state universities and colleges (SUCs) and local government units.

During the SSCF awarding ceremony, BSWM assistant director Sonia Salguero highlighted the continuing efforts of the Bureau to attain food security, saying: "For almost six decades, the BSWM has been the farmers' and all other agriculture stakeholders' arm in securing food security through programs and projects we implement. The BSWM devote our services to provide quality assured projects for safer food to everybody in a large scale."

Since 2009, the DA-BSWM under the organic agriculture program has established 138 community-based composting facilities in the Cordillera region (particularly in Apayao, Abra, Kalinga, Mt. Province, Ifugao, Benguet and Baguio). With the facilities, Cordillera farmers were able to reduce their dependence on chemical inputs, Salguero said.

In particular, the SSCF has enabled farmers to produce their own organic fertilizers ranging from 60 to 80 bags of vermi-compost every 45 days. Each facility is given to farmers belonging to a cluster farm, totaling at least 100 hectares. The BSWM provides farmer-beneficiaries hands-on training on how to operate the composting facility and how to produce vermi-compost at the agency's regional soils laboratory with the help of DA-RFU technical staff, said Salguero.

"Now that our country is being recognized all over Asia in terms of organic farming, the BSWM will continue to promote the use of organic inputs through establishment of different facilities to strengthen the capacity of LGUs, farmers' cooperatives and associations, SUCs and even civil society organizations to produce natural farming inputs," Salguero concluded. (by Loraine D. Cerillo, DA-BSWM)



*Dr. William Dar (middle) keynoted the 37th CVAARRD anniversary at ISU, Echague, Isabela, where he discussed the topic: "Is modernizing and industrializing Philippine agriculture possible?" Above, he received a plaque of appreciation from the RRDC chair Dr. Aleth Mamauag, ISU President in the presence of CVAARRD Executive Director William Medrano and heads of member agencies.*



thus are safe," Dar said.

On the safeness of Bt eggplant, Dar added that science experts like Robert Goldberg, a renowned plant molecular biologist at UCLA, said GM crops go through rigor of tests, and in the event of a health threat, it can be quickly identified and eliminated since the gene can be tracked, including the activity of every single gene around it.

It has been noted that even the backing on GM crops by key associations like the American Association for the Advancement of Science, American Medical Association, and National Academy of Sciences, including favorable research results from academic bodies of other countries, including the Philippines has not been sufficient to temper the noise made by anti-GM interest groups.

**Economic Benefits**

Dar said the economic benefits of commercializing GM crops have to be factored in. In addition to increased yields, the cultivation of GM crops means less use of chemicals. He said David Zilberman, a noted agricultural and environmental economist, the yields of Bt corn, Bt cotton and Bt soya have increased by 20 to 30 percent, enabling farmers to profit considerably.

"The adoption of Bt eggplant would mean more income for poor Filipino farmers, and more affordable and safer eggplant for consumers," Dar noted.

Further, he said with the country's increasing population, at over 100 million, there is an urgency to produce more affordable and nutritious food for Filipino families, from dwindling land and water resources. There is also climate change, which exacerbates the situation. Therefore, we have to rely on GM crops that have been found to produce more yields and can withstand various production risks, like low and high temperatures, insects, and diseases," Dar said.

"The SC ruling against Bt eggplant, is a clear case, of non-consideration and perhaps even ignorance of the merits of GM crops. It should allow for further testing with good oversight," he added.

The SC decision also nullifies the Department of Agriculture Administrative Order (DA-AO) No. 8 Series of 2002, which Dar said poses a major setback, as it will affect the importation and release into the environment of plants and plant products derived from the use of modern biotechnology. InangLupa sees this as the significant deceleration of agricultural development. The clock of science is being held back. Scientific research must be continued. The country will not be able to harness its agriculture especially in meeting food demand and quality if the SC decision is not reversed.

The InangLupa Movement is an organization that nurtures an inclusive sci-based, resilient and market-oriented Philippine agriculture. Its mission is the empowerment of stakeholders towards food and nutrition security, economic prosperity, environmental sustainability and upholding human dignity. To become a volunteer in this movement, visit/register to: <http://inanglupa.weebly.com/become-a-volunteer.html>

was unsafe for human and animal consumption, in contradiction to hundreds of high-quality safety studies conducted by reputable scientists internationally over the years, and an overall GMO safety consensus that is highly robust and supported by every major scientific academy in the world, including the NAST in the Philippines.

It is possible that the Court did not take into account that Seralini has been comprehensively discredited since his Greenpeace-funded report was written in 2009. In 2012, the same Seralini published a paper claiming to show that GMO maize caused cancer in rats. However, the methodology of his study was later judged by scientific reviewers to be unsound, and his paper was retracted by the journal that published it—a highly unusual move and fatally damaging to Seralini's credibility as a scientist.

Unfortunately, Greenpeace—which, as a powerful multinational group, has a turnover of hundreds of millions of dollars annually—is used to getting its way. The same bogus science was also used by Greenpeace to bamboozle the Indian government into issuing a moratorium on *Bt brinjal*, the Indian version of *Bt talong*.

Greenpeace also uses criminal methods when it chooses—for example, vandalizing one of the Filipino field trials of *Bt talong* at UPLB in 2011. Ironically, its activists only succeeded in destroying non-transgenic plants, as they were unable to tell the difference in the field.

It is important to recall that the intent behind *Bt talong* is to reduce insecticide use. This would benefit farmers, consumers and the environment through reducing the exposure to toxic pesticides. *Bt talong* protects itself against the main insect pest, the fruit and shoot borer, using a bacterial protein that causes the insect to stop feeding. This is the same protein used by organic farmers and has a long history of safe use to humans and the environment.

In Bangladesh, where the government ignored attacks and legal machinations by anti-GMO activists, *Bt brinjal* is now fully commercialized and studies have found reductions in farmers' pesticide use of 80 percent or more. It is peculiar that Greenpeace, which elsewhere campaigns against pesticide use, apparently aims in the Philippines to maintain farmers' dependence on pesticides because of its superstitious approach to modern biotechnology in agriculture.

The success of *Bt crops* as a technology to reduce pesticide use is already evident in the Philippines, where *Bt corn* is currently planted over 800,000 acres and has been safely in the human food chain since it was first commercialized in 2003. Farmers report substantial cost savings as a result of reduced expenditure on insecticides on the biotech corn. Most of those benefiting are small resource-poor farmers cultivating corn on an average of just two hectares each.

Unless the Department of Agriculture can quickly re-issue a new administrative order governing the introduction and assessment of GMO crops and foods, to



*The champions of InangLupa Movement having fun during their simple Christmas dinner.*

replace the AO 8-2002 that was struck down by the Supreme Court, agricultural improvement in the Philippines will be very negatively affected.

In particular, *Golden Rice*, which is intended to address vitamin A deficiency in malnourished children, could be held back. Golden Rice trials have also been vandalized in the field by many of the same anti-GMO activists who oppose *Bt talong*.

The Court's decision is disappointing to scientists and anti-poverty campaigners because the Philippines has always been a pro-biotechnology regional leader.

While Greenpeace and other activist groups have, through a combination of vandalism and lawsuits, hampered agricultural scientific progress in countries from Thailand to India, the Philippines has stood out as an early adopter of modern science in farming that benefits society at large.

Let's hope that the Philippine government and the scientific community can quickly deal with the issues raised by the Supreme Court, so the country's progress in agricultural development is not held back by several years. ([opinion.inquirer.net](http://opinion.inquirer.net))

Mark Lynas is a British environmentalist, writer and visiting fellow at the Cornell Alliance for Science at Cornell University.

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Tel No: +63 (02) 232 2129; +63 906 4104 023; +63 917 6512 711  
Office: InangLupa Movement, Inc. Office  
Address: DA-BSWM Building, Diliman, Quezon City, Philippines