An Interview about Quantum Agriculture, Program: "Do You AGRI?

Aired at Radio DZLB on March 21, 2012. A Student project in Development Communication 130 Class. Guests, Prof. Pam Fernandez, Prof. Marvin Albao, Ms. Daniel Cuevas (major in Agrobiotech) and Ms. Jen Macam (major in Applied Physics). Interviewer: Joan Nacorda (major in Development Communications).

Joan: You're with us here at "***Do You* AGRI**?" with your host Joan Nacorda. Our panelists are Prof. Pamela Fernandez from the College of Agriculture, Prof. Marvin Albao from the Institute of Mathematics, Statistics and Physics of the College of Arts and Sciences, and our student friends, Ms. Jen Macam and M. Daniel Cuevas.

Let us have a quick preview on what Quantum Agriculture is. According to our research, Quantum Agriculture is a form of agriculture that employs some principles of physics like the use of waves, etc. I'm sure it is very hard to understand for you guys out there so we want to ask our panelists a few questions so we will be able to understand what Quantum Agriculture really is.

Joan: First question for Prof. Fernandez, what is really the major difference between quantum agricultural practices and the conventional agriculture practice?

Pam: The names of course differ… and the name Quantum Agriculture is quite recent although the practices employed may be very old. Some of the practices are quite new. If we say that the current mainstream agriculture uses chemicals or synthetic products such as pesticides, herbicides and fertilizers, Quantum Agriculture- the way we define it- is something that is on top of, or beyond, whatever is more natural and organic. It uses energies, especially subtle energies, and even aspects beyond energy. There is this thing called **"information system"** which is also an aspect of nature (*beyond matter and energy*). What we are looking at here are the invisibles and subtle forces.

Joan: Are they like waves?

Pam: Waves, yes; it can also refer to transitory particles, or it can already be at the level of information, which are more subtle than waves or energy.

Joan: Is this like what they said… and refers to practices like… talking to plants?

Pam: Talking to the plants, yes, and employing subtle power and talking to what/whoever else that is not visible. Some people do that because they believe in the practice.

Joan: A question for sir Albao. We heard that some physicists and some people from the Physics department want Quantum Agriculture to be under the umbrella of Physics instead of being under Conventional Agriculture (and practice), because it uses a lot of Physics concepts like waves, wavelength, etc. (as we gather from our own research). What can you say about this?

Prof. Albao: First of all I'm not aware of any move from the Physics department to make Quantum Agriculture under one of the labs of the Physics division. I myself, a physicist, am not an expert in Quantum Agriculture. Although I understand quantum mechanics, I am totally blank on agriculture. But fortunately for us, Dr. Fernandez is an expert on Quantum Agriculture and I believe she is more than competent to answer all the questions.

Joan: So those were just rumors then… But in your expertise in quantum mechanics, do you think quantum mechanics can be used in agricultural practices?

Prof. Albao: Well to be honest I am a bit skeptical about that because quantum mechanics deals with phenomenon which is in the sub-atomic scale, with phenomenon which is microscopic in nature. We're talking about say 10^{-9} of a meter ... or one billionth of a meter phenomenon. The minute that you apply quantum mechanics on phenomenon that can be experienced in the everyday world or the so called macroscopic objects, any quantum effect will be lost…There is a principle in quantum mechanics called **correspondence principle** which means that if you are viewing a phenomenon at the macroscopic level, then essentially the predictions of classical mechanics and quantum mechanics are essentially gone.

Joan: So this means that … if we apply this concept in quantum mechanics to our conventional or usual/normal agricultural practices, there will most likely be change in the dynamics of how agriculture works, right?

Prof. Albao: You're probably alluding to the **uncertainty principle** which generally says that if you're observing a phenomenon… essentially this mere act affects, or impacts on the thing that is being observed in a way you cannot get an accurate measurement… I think you're alluding to that right?

Joan: Yeah… So, I think that is a perfect seguey for our next question. This is again for Prof. Fernandez. Sir Albao mentioned that there are costs when you apply quantum mechanics into your agriculture. We would like to know ma'am what would be the cost if you practice Quantum Agriculture as compared to the conventional type of agriculture?

M Pam: Cost meaning economics?

Joan: Whatever kind of cost there is.

M Pam: If you're going to apply quantum?

Joan: Yes ma'am compared to your normal agriculture.

M Pam: Let us first clarify that Quantum Agriculture is not just one practice but a spectrum of approaches that involves different kinds of energies and it can invoke forces that may be beyond that, like those that operate at ten to the minus nine level and forces beyond… there are still forces there (*even stronger*). Let me share here that my advocacy is to promote Quantum Agriculture… "quantum" is being used more as a generic term like in quantum pendant, quantum leap, etc. This is because I have reached the conclusion that we now badly need approaches that are beyond the usual, beyond the ordinary, and that we need is to

do a **quantum leap.** This is also because we have already proven for so long a time that the shift from chemical to ecological and organic is so slow, and we are aware that the Earth is already so imbalanced, so damaged. On the other hand, people are still talking about solutions that come from the same old framework and so I urge them to do a quantum leap! That was my original intention in calling it Quantum Agriculture…

I found out later through some internet research that there are already many who use the term "quantum agriculture"… Further deepening on the subject occurred over time… and I eventually realized that there are a lot of new or modern approaches to harness that power… that which is inside the atom. But there are also quantum approaches that reside in the practices of indigenous peoples, which are very simple and have great impact or effect.

Joan: Now a question for Daniel who is an agriculture major student. You're studying the different practices of agriculture. I heard that there is this course now being offered- Quantum Agriculture. Do you think we should make this course mainstream? Do you think we should incorporate it into the mainstream agriculture curriculum?

Daniel: Such course is only for graduate students. The concept of Quantum Agriculture is very new to me and I find it very interesting as well. I feel that it will be helpful. But first I have a question for ma'am Pam. How is the application of Quantum Agriculture in large scale?

M Pam: There are time-tested models of sustainable agriculture, and one of those is biodynamics, which is farming with life forces, which in turn are influenced by cosmic alignments, of stars, or constellations, planets and the moon. This and others are applied in large scale, in other countries and in the Philippines. There is a big initiative in Mindanao *(Don Bosco Foundation for Sustainable Development, with more than 3,500 farming families)*. The other forms are practiced in India and various other places. It really depends… approaches can be applied on large-scale and small-scale.

… and so as to the application of Quantum Agriculture in large-scale or into the mainstream practice like in Agro-Biotech, let me mention that recently there is this research (and scientific poster paper) that showed that with application of a substance that carries this quantum force onto callus in tissue culture, the response is different and so amazing. Quantum power in this context (Quantum Agriculture) refers to or is characterized by use of a very very small amount of substance. This is very much like comparing input use with the different farming systems. With chemical fertilizer you might need to apply 15 bags in a hectare, in organic you use an equivalent of 100 to 500 bags (*to derive the same amount of nutrient-usually based on nitrogen*). In Quantum Agriculture you only fertilize with like 1 tbsp or even 1 gram.

Joan: In the practice of Quantum Agriculture, you're using energy all around, right? Let us now ask our expert in Physics. Sir Albao, is it really possible that we can use this kind of energy around us to help plants grow, or is there any in Physics that proves this, or has there been any study before that is related to this?

Prof. Albao: I think… two things there. We know that we need heat energy from the sun to make plants grow. I think that is well established in Biology. Without the sun, without the heat then no life form on Earth

is possible. So in that sense it is true. About the effects of the planets and the solar systems on farming on Earth ... I also think that has some basis because we know that the moon can influence the tides and everything else. In a way we are indirectly affected by planetary movements, but only in a sense that the moon can influence the tides. Farmers in the coastal areas are dependent on the schedule of tide movements, so forth and so on. So I think only in those limited sense. But of course I am not an expert in agriculture like our esteemed guest Prof. Fernandez.

Joan: This is really something that we would like to have a study on. For our Physics student Jen, I would like to ask … seeing the flow of the discussion, where we are talking about how this type of agriculture is being affected by a lot of energies around us, like the solar energy and the pull of energy (from the moon), do you think that the College of Arts and Sciences (CAS) together with the College of Agriculture (CA) should also offer this type of course? I do think it is a new type of practice and kind of sounds interesting. So do you think you or an average student would be willing to study it? Would you be willing to study these kinds of things in your Physics classes?

Jen: You mean add it as a course (subject) or as a major?

Joan: Yes as a course or a major field.

Jen: I think yes, because it would widen the range of applications of Physics… Apart from materials physics, or application on Chemistry or Biology, Physics also has application on Agriculture. So then we students will have a wider range of choices and interests.

Joan: Thank you for your comments everybody. We will be right back…

BREAK

Joan: Earlier on we were discussing about Quantum Agriculture … about the use of subtle energy, for example, in the practice of agriculture, of solar energy and other planetary energies. It tries to incorporate and minimize the amount of mainstream fertilizers like chemicals and other kinds of fertilizers and tries to incorporate the old practice of Filipinos like talking to invisible energies out there. But more than that, we also asked some of our fellow students who are with us here at the studio about how they feel if these courses were integrated into their curriculum. They told us that it is alright for them because it looks like a brand new study and something that can widen our horizon.

Let us continue with our discussion… Earlier on, I've asked about how our students would feel if these kinds of practices were integrated into a curriculum. Now if already integrated, Quantum Agriculture can most likely become mainstream, right? Now… this is for Prof. Fernandez… do you think ma'am Filipino farmers should integrate Quantum Agriculture into their mainstream or current practices?

M Pam: Actually, what they are now doing is already quantum.

Joan: Is that right?

M Pam: Some of the things that farmers do are already in the realm of quantum given the generic definition of quantum. The concept of quantum has a wide range, such that it also includes thoughts, consciousness and the like. These are already acknowledged and recognized to have power (effect).

Joan: So you are now just formalizing their study?

M Pam: Yes and in some ways I blend the old and the new… If you want to promote Quantum Agriculture, consider the interesting and useful things of modern agriculture and modern science, and incorporate or apply some context of the past (old), because people of long ago were already inventing and doing practices which we now label as superstitious beliefs or just simply beliefs and don't have scientific basis. But now it has been found that rituals, prayers, offerings have real impact on the production system. These practices would not persist if people didn't see or experience the phenomenon (effect) … people are smart enough to know. If those practices have no value or effect they would already have been abandoned. The strength that I see in quantum science is that it can validate ancient practices. Here is an example: singing in the field, offering something… like for rat management… instead of fighting or poisoning them, offer something to them or talk to them; then they would not be a problem … In corn planting, farmers let a seed sample pass through the mouth part of a dead snake (or just the skull remains). There seems to be no link or basis, but farmers and other practitioners claim that it is really effective.

Now there also practices, and we have tried them (*it's not just a hearsay*), that if we use just a very small amount of a substance (*and potentize it*), a huge response is obtained in plants… not only in terms of yields but also in terms of quality of the substance or the produce- it becomes tastier.

Joan: I see. Now for Sir Albao… we've read that quantum mechanics and quantum physics in general arose from the thought that maybe there is something about the particles around us that affects us in some way. We would like to ask you now sir… about what ma'am was saying earlier, that our rituals before sort of have a form of quantum energy in them? Is this kind of quantum energy also being tackled in Physics department?

Prof Albao: …I'm not really sure… I have no idea.

Joan: If ever there is a connection, would the Physics department study this?

Prof Albao: It is probably some interesting phenomenon that we might want to consider in the future. However, we have to remember that we have limited number of physicists in the country. And I think they are already into whatever field they are in. For instance I am a computational material scientist and so I would just say that it is an interesting phenomenon. It probably has some explanation that is grounded on Physics. But we haven't discovered it yet. And at this point it is not probably being done anywhere in this country. But I agree that it might add some value, and in the future it might be explored. I just don't see it happening within the immediate time, like maybe in the next 24 months or so. So it's possible. Anything is possible.

Joan: So that's how we see it, right? Also that currently it is not being studied by physicists here in the Philippines. But many outside the country are already studying it. But it is possible that these kinds of studies can happen here and that Physics and Agriculture can work together…

And for our students here with us, we would like to ask you… now that you've known what Quantum Agriculture is, and as students, do you feel that you can employ (*embrace*) it? I mean I don't think agriculture practices are boxed in as just farming and gardening practices, so would you advise using Quantum Agriculture practices to your friends? May we have an answer from Ms. Daniel?

Daniel: If I'll advise them to use Quantum Agriculture? … probably yes. This is because that which was described about Quantum Agriculture, like singing to the plants, etc. … there you can actually express yourself, and apply it also to the plants. And you get positive effect on yourself and on your plants. That is because there is a connection between you and your plants.

Joan: For Ms. Jen… do you think you're going to suggest it to your friends, like you'll say "let's go study Quantum Agriculture and let us try to incorporate our Physics knowledge there"?

Jen: Yes, since there are already research results that show that Quantum Agriculture really works. I will encourage this…

Jen: A question for ma'am Pam. Have you found or what methods or practice (in Quantum Agriculture) that came solely from Quantum Physics? So far it seems that what you have earlier cited are those old ones… and which are now just being validated through or by Quantum Physics. What methods from Quantum Physics are there that are now being applied in Quantum Agriculture?

M Pam: I did not formally study Quantum Physics (*and do not know its full scope*)…

Jen: I mean what are research that are being used there (in Quantum Agriculture and are only from Quantum Physics)?

M Pam: Please give me an example (*of a study, practice or process*) that comes from Quantum Physics. .. or do you refer to those that involve opening the atom and harnessing the energy inside… something like that?

Jen: I guess some method that is really from that (QuantumPhysics-more modern), not from ancient ancestral practices. Are there?

M Pam: Examples of modern quantum (and are applied in agriculture) are there; bio discs, scalar discs are being used nowadays. Some of these have been put together using small glass-like particles and overall looks like a glass coaster… using Nanotech. When you use or wear them you experience some benefits like reducing jet lag, or you easily regain or increase life force. When you put it in water in an aquarium, the weakening fish becomes active again. There is also an application of quantum in engineering… the **flowforms**. It is a set up where a series of basin-like structures with specific or prescribed dimension are

made to catch a flowing water and this way the movement of water is natural; it is in *spiral form* (vortex, infinity shaped like a lemniscate). Each disc allows water to do the same thing… and at the end of the line water is transformed, cleaned and free of particles but the cleaning process is not via filtration. The term that is used is **transubstantiation** or alteration of the chemical structure resulting in purification. I would say that flowform is a more recent (not ancient) term but the mechanics is simply a copy of nature, of water as it flows down the stream.

Joan: Ma'am we would also like to ask… because you told us that Filipino farmers are already using these (quantum practices) … Are there studies and results such as those that the College of Agriculture really has put its attention to and tested, so that the scientific method was applied and are shown to be really effective?

M Pam: Actually there are already several research or studies, small trials done by my students; there are also thesis done my students. Only a few has been published so far. I believe t**hey** have been thorough done, in terms of their scientific method. It is a bit tricky to do quantum research, if we may recall what Dr. Albao said… that the observer affects what is being observe. Thus one cannot really say that this is the exact amount or degree of effect that one gets from a certain subtle energy treatment. But in general there is really an observable effect. An example is the simple stirring of water in a vortex form. Vortex is made by creating a deep funnel while stirring… the direction of stirring is then reversed and the same process is repeated for say 15-20 minutes. Here we found in a thesis that seedlings really have 10-15% advantage in vigor over the untreated ones. We were really amazed with this. Our own smaller verification trials gave similar results. Something really happens to the water when you stir it that way.

Joan: So there have been studies about it ("quantum"); hopefully we can read more published articles about it in the future because this is a different kind of study; an avant garde even. Even if they're doing it before, we're just not really aware that they're doing it.

BREAK

Joan: Earlier again, we were discussing with our guests here at the studio about what Quantum Agriculture really is. Our resident physicist told us that it hasn't been studied yet in the Physics department in the College of Arts and Sciences, but he hopes that in the near future there will be. Then hopefully the farmers will be able to integrate some of these studies made in our Physics classes. Hopefully also, students will be able to understand what Quantum Agriculture really is. On the other hand, our expert coming from the College of Agriculture told us that Quantum Agriculture has been a consolidation of the practices that we have done in the past (olden times) like the rituals coming from our forefathers and that there has really been effects of these practices, like for example when you use water stirred or moved in a vortex form perhaps in a cup or glass. We were told about results of their study… that Quantum Agriculture has been very effective in growing better plants or even tastier plants.

We're still with our guests, Prof. Pam Fernandez, Prof. Marvin Albao, Ms. Daniel Cuevas and Ms. Jen Macam. Another question for our students here… now that you've known about Quantum Agriculture, what is your stance … for example, when given comparison between Quantum Agriculture and Organic

Agriculture, and with the other kind of agriculture which uses chemicals and other kinds of fertilizers? What can you say about Quantum Agriculture now? Or would you now advocate non-chemical?… would you now say stop using chemical fertilizers and go for Quantum Agriculture? What is now your stance?

Daniel: Before I answer your question, can I ask Ma'am Fernandez? Ma'am is Quantum Agriculture something under Organic Farming or is it something totally different from it?

M Pam: Quantum Agriculture can be said to be a step in an evolving process. This perspective is according to my journey; it evolved from my (simple type) organic perspective. I have already decided long before to shift from chemical to non-chemical (or organic). Then I noticed that organic has been there for many years and has not really taken off. Only now that there is a law… that people are starting to do organic; before no attention was given to it. I did organic then because it was something that I really liked. Later I realized that some of those practices are deeper and quantum. The others are still in the physical or material level.

There really are many practices under organic (*may be shallow or deep*). Organic is a spectrum of practices. It is not only about what you planted and what you used as fertilizer. It is in a sense a spectrum of practices from seed to seed, and more. If for example you follow the natural way, and did not rely on bought expensive organic inputs (such as quantum gadgets) just to be considered organic, then you are truly organic. This is because you harnessed the creativity of the farmer and the system is simple but powerful… these are the essence of organic… Then you could just add quantum practice to your system. ..

This also depends on who is in control, and how deep you want to bring it (your farming system) … if just up to the level of inputs only, or up to the aspect of whether the farmer really benefited from his endeavor. A farm can be organic (in inputs) but if it is only the other countries who benefit from his efforts- like when he exports his product to them (*equity issue*), then it is not organic in a deeper sense.

Joan: What is your stance now, Ms. Daniel?

Daniel: Actually my interest in Quantum Agriculture has been deepened. Think of it… if we apply Quantum Agriculture, firstly we keep the Filipino traditions. Then we lessen our inputs; such is valuable now since we are not a rich country and prices of chemical fertilizers are very high. And if we sustain high production level, then Quantum Agriculture is ok!

Joan: For our friend from the Physics department, Ms. Jen, do you think now that you've learned about Quantum Agriculture… if ever it becomes integrated into the Physics curriculum, would you be willing to take on the challenge of improving the study of Quantum Agriculture and let people know what it really is all about? Or are you still willing to forgo this and go for other practices?

Jen: The practices of agriculture or Physics?

Joan: Physics.

Jen: Personally, I will not take on Quantum Agriculture because it is still new. I have also already chosen another field. I think it would be better for me to just continue with that chosen field.

Joan: For Prof. Albao, if ever we gain more Physicists here in the Philippines, or if there's an opportunity abroad, do you think Filipino scientists would be willing to take on this new kind of agriculture and probably produce papers about it so that we can improve this kind of practice if it is probable?

Prof. Albao: If all those results that Dr. Fernandez was talking about- such as the increase in the harvest- if they can be replicated in some kind of experiment, controlled experiment, and if there's some evidence that they actually work, then I think it might entice some people among the Physics community to consider so called Quantum Agriculture. But Physicists in general are very careful when they publish papers. They need proof, to borrow the language of law. I mean we need proof without reasonable doubt. The standards are very high, but if we are convinced that there is something to it, then it would be something that we might look into in the future. But at this point, I think it is up to the College of Agriculture to really promote this kind of practice because the more mainstream it becomes, the more people will be enticed to actually go into this field. So I think the first thing that they have to do is to really promote awareness in this new kind of agriculture. In the end it is really up to the agriculture department.

Joan: Lastly, this is for Prof. Fernandez. Ma'am we heard a lot of things from our fellow panelists here. I learned that Quantum Agriculture is a graduate course… what else can you recommend for the academe and even for our regular farmers out there, what can they do for example if they want to learn more about Quantum Agriculture?

M Pam: I think it's moving towards being mainstreamed because the Department of Agriculture (DA), Agriculture Training Institute (ATI), the Bureau of Plant Industry (BPI), and some NGO's are now curious and asking questions about Quantum Agriculture. I recently did some training with them… specifically for the national trainors on organic farming. I told them organic is only the starting point, and I myself prefer not to deal anymore with the shallow approaches; I am already tired of that. I'd rather not if we will not bring organic to the quantum level… there are already so many approaches and are deeper. They agreed with me. In the training I saw them getting inspired and fired up to try quantum because the practices are simple and exciting (*also validates what they know from the olds*). Aside from applying Quantum Agriculture on plants it is also for animals (and the land, water and air) and human healing. They are also medicine for people.

Joan: It is like they are therapeutic for our life?

M Pam: It is more than therapeutic. It effects long deep healing. It has multi-dimensional effect. If you are patient and just wait, you will really see the results. But the academe must be more active and open to new things. I am of course thankful that it allowed me to offer the Quantum Agriculture course even if I only have a few students each time; usually a class should have 5 or 10 students and I usually have only have one to three. This is because the course is a "new frontier" course. Unfortunately, I cannot offer it at the undergraduate level because we lost our Agronomy- Special Topics option in the undergraduate level. A lot of students wanted to take it before. But even if they can and want to, they likely couldn't because they are already so loaded with their own set of subjects in their curriculum. Anyway, one may also just informally study quantum agriculture on the side.

Farmers who are taught some practices can easily learn them … There is this very simple practice like **Agnihotra**. It is a sunrise, sunset ten-minute practice using a pyramid. It's simple. I am actively promoting it because I very much believe that it is not just the quantity but also the quality of food that we produce that matters. This is emphasized by those scientists and philosophers who believe in the effect of subtle forces or subtle energies on plants and animals- that the **quality of food that you eat has a bearing on your consciousness and how you think**. If for example you eat food that is derived from a brutally killed and reared animal, the negative energy (*and chemicals produced in the system*) will be transferred to you. You will have a kind of thinking that is not favorable or positive. Also, the kind of food that you eat will translate to your will and that is exactly the problem now with the Filipinos: we lack the will and such will is dampened or killed by our education system. We are not made to move when still young, and I really would like to reverse this situation. What our country needs for transformation is an ascended will and you can get that from food. To me it is central to produce food that is not only good tasting and nutritious, but also with high life force which in turn impacts on our consciousness.

Joan: We've heard about how our food affects us as well. Basically the goal of Quantum Agriculture is to provide us quality food that will not only or would just give our plants better life and grow better, as well as give us better food. More than that, Quantum Agriculture's goal is to make us a better person as Ma'am said. It is like the cliché or saying "You are what you eat." That is basically what Quantum Agriculture is all about. But we're still hopeful that in the Physics community it becomes a mainstream. We hope too that people from the scientific community would dabble on it and study how it really happens, so that many of our fellow skeptics out there will be enlightened about this topic altogether.

M Pam: If I may add… Our concern in agriculture production, and my hope really is that more people will do it. Through Quantum Agriculture we are going to facilitate the healing of the Earth because like biodynamic and this other practice called Agnihotra involving a small inverted pyramid can really alter (heal) the atmosphere. These practices target two or more basic aspects of our existence, Climate Change and food production.

Joan: It's going to help us reduce our Carbon footprint and is for Climate Change. Quantum Agriculture is a holistic practice. We hope that everybody out there listening to us at Radio DZLB 1116KHz learned a lot from our panelists. We would like to thank our panelists, Prof. Fernandez, Prof. Albao, Ms. Cuevas and Ms. Macam for joining us here this afternoon. Thank you all.