DIMINISHING RICELANDS AND THE MISSING RAINFED AREAS

A Short Paper on the Importance of Preserving The integrity of Our Rice Lands

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OBJECTIVE:

This paper aims to provide an analysis as to whether there is a need to change the definition of prime agricultural land contained in the NLUA Bill and concentrate only on *all irrigated areas, irrigable lands and rain–fed areas planted to rice; all alluvial plain lands highly suitable for agriculture whether irrigated or not; all agricultural lands that are ecologically fragile, the conversion of which will result in serious environmental degradation; and mangrove areas and fish sanctuaries.*

The present definition of prime agricultural lands in the NLUA Bill was based on the NPAAD definition, pursuant to Sec. 9 of the AFMA Law or Republic Act No. 8435 and this was vehemently opposed by the land developers and realtors and the landed genre in both houses of. Congress since it encompasses almost all type of agricultural lands (10.3 M has.) and this might be the probable cause of the non-passage of the Bill.

If finally determined that changing the definition of prime agricultural land as stated above would be more acceptable to the members of Congress, and would facilitate and ensure the passage of the NLUA Bill, then, it would be most wise since we will be able to protect, and conserve at least the 4.35 million hectares planted to rice and all other lands (corn lands, rice terraces of Benguet Province, etc.) and *all alluvial plain lands highly suitable for agriculture whether irrigated or not; all agricultural lands that are ecologically fragile, the conversion of which will result in serious environmental degradation; and mangrove areas and fish sanctuaries.*

Also the definition cited above will be in synced with the intent of House Bill No. 5501 (An Act Prohibiting the Acceptance, Processing and Approval of Application for Land Use Conversion of Agricultural Lands, Irrigated Lands, Irrigable Lands to Non Agricultural Purposes).

It is therefore prayed that the advocacy for the passage of the NLUA Bill and the HB Nos. 5501, be guided accordingly by this paper.

[1] This paper is written by Elvira "Ka Elvie" Baladad, a farmer leader of Macabud, Rizal and a daughter of a rice farmer-teacher from San Nicolas, Gapan, Nueva Ecija. She was the former President of the Pambansang Kilusan ng mga Kababaihan sa Kanayunan (PKKK). She took on this research as a farmer leader and an advocate for the conservation and perpetual protection of Philippine rice lands to ensure that the succeeding generations can still eat rice harvested from our fields.

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Rationale

Filipinos will surely go hungry if nothing is done with the unabated conversion of irrigated, irrigable and rainfed lands planted to our staple food-RICE.

Rice is a highly political commodity and it has always been the center of the government's agricultural policies which revolve around promoting rice self-sufficiency, food security and if these policies are not properly implemented, it can result to chaos, violence and anarchy on an unimaginable scale.

Rice production in the country is important to the economy and food supply since it is the major staple of the Filipinos. The Philippines is the 9th largest rice producer in the world, accounting for 2.8% of global rice production, but it is also the world's largest rice importer because rice production cannot keep up with the fast rising population. BUT importation of our basic staple should not be the end all of the problem of low production. The Philippines should not and must not turn its back and renege in its responsibility of feeding its own people and relying on the imports and supply from other countries to augment the dwindling production.

There are other ways to increase rice production in the Philippines and it was not mentioned in the policy brief of the SEPO and Senators Recto and Villar, as if importation and tarification is the only salvation for poverty, hunger and starvation of an "estimated 21.93 million Filipinos (21.6%) cannot afford to buy their basic food and non-food needs; and that 8.23 million Filipinos (8.1%) are subsistence poor (or food poor) as their incomes are not sufficient to buy even their basic food needs." (SEPO Policy Brief). Are there sizeable number of Filipinos, belonging to the (8.1%) subsistence poor (or food poor) who are already dying of hunger?

Methodology

This paper will present numbers, data and projections based on official reports from the National Irrigation Authority (NIA), Department of Agriculture (DA), PhilRICE and the Philippine Statistics Authority (PSA), and in the end come up with recommendations that are not band aid solutions but rather concrete and permanent that would last for the next generation of Filipino eating rice.

Discussion

There are four major reasons why we have to conserve and protect in perpetuity our remaining rice lands. First is the limited land area devoted to rice production, second is the production capacity or yield, of the rice lands, third is the population growth, and lastly, the infrastructure (irrigation system) needed to increase the yearly production of rice.

A. LIMITED LAND AREA FOR RICE PRODUCTION

The Philippines comprises about 34,289,876 million hectares of land (*as of 2007 Philippine Standard Geographic Code (PSGC)* and only 4,556,000 million hectares (as of 2016) or about 13.2983% of the total land area are being used for rice production. These lands are in dire need of PERPETUAL PROTECTION and CONSERVATION to ensure that there is always rice in the Filipino tables. If these lands will not be protected by an enabling law as to its non-convertibility to non-agricultural uses, surely, the country will be faced by rice shortages and competition for rice supply is inevitable.

Expansion of suitable areas for rice production is limited since the Philippines is mountainous and it is a nation of islands without any major rice deltas, Central Plain of Luzon which is considered the rice granary of the nation is very small compared to those in Thailand and Vietnam, the world's top two rice exporters According to the National Mapping and Resource Information Authority (NAMRIA), the present count of islands, as of 2016 is 7,641 from the previous data of 7,107 islands and most of these islands do not produce their own rice. The most devastating is the rapid expansion of urban areas and other non-agricultural uses that encroached on rice land and these changes in land use as termed by the National Irrigation Administration, as Permanently Non-Restorable Areas. When the land use of prime agricultural lands is changed, the process is irreversible. The capacity to produce food is totally and permanently lost. And if rice is scarce and no longer available especially to the poor and marginalized sector, chaos, violence and anarchy on unimaginable scale can ensue.

Total land area of the Phils.	34,289,876 Million Has
Total Area Planted to Rice *(As of 2016)*	4,350,000 Has.
Total Irrigated Area	1,855,982.17
Total Irrigable Area to be Developed	1,272,648.83 (w/ less than 3% slope)
Total Rainfed Area	1,427,369.00 (w/ more than 3% slope)

(*Source PSA and NIA*)

Based on the inventory as of- Dec. 31, 2016, out of 4.35 million hectares are being planted to rice, the estimated irrigated and irrigable areas is 3,128,631 million hectares. Only a total of 1,855,982.17 hectares are actually irrigated and capable of producing rice for two (2) or sometimes even three (3) cropping seasons. The remaining areas that are still to be developed are called irrigable lands and it stands at 1,272,648.83 million hectares. These lands were found, determined by National Irrigation Administration and characterized as having less than 3 percent slope criteria, thereby making it suitable for irrigation developments. Presently, irrigable lands are NOT producing its optimum capacity since its yield is for only one cropping season (wet season), The remaining 1,427,369 M are those that were found to have more than 3 percent slope and are considered rainfed areas or "*sahod ulan"* and has only one cropping season.

Land Area Per Region Vs. Area Used for Rice Production & Total Irrigated Area

REGIONS	Total Land Area	Area Used for Rice Production	Total Area Irrigated	Rainfed Areas	Total Area Used for Rice Production	% of Riceland vs. Total Land area
LUZON						
NCR	63,600	None		None	None	N/A
CAR	1,942,203	111,295.65	96,227.54			5.7303 %
Reg. 1-Ilocos	1,301,260	264,491.00	188,519.32			2.032 %
Reg. 2-Cagayan	2,822,883	457,246.76	293,004.21			1.620 %
Reg. 3-C. Luzon	2,201,463	483,830.18	314,193.28			2.198 %
Reg. 4A CALABARZON	1,687,331	85,929.00	60,903.00			5.092 %
Reg. 4B-MIMAROPA	2,962,087	143,558.95	91,344.52			4.846 %
Reg. 5- Bicol	1,815,582	239,440.00	138,723.49			13.188 %
Sub Total 14,732,809	14,796,409	1,785,791.54				12.06909%

VISAYAS						
Reg. 6- W Visayas	2,079,418	191,253.17	121,953.32			9.197 %
Reg. 7- C Visayas	1,588,597	53,674.35	48,710.00			3.379 %
Reg. 8- E Visayas	2,325,110	91,982.90	71,924.65			3.956 %
Sub Total	5,993,125	336,910.42				5.62162
MINDANAO						
Reg. 9- Zamboanga Pen.	1,682,291	93,706.00	50,639.54			0.05570 %
Reg. 10- N. Mindanao	2,049,602	121,122.69	70,565.66			5.90957 %
Reg, 11- Davao Reg	2,035,742	177,546.92	69,803			8.72148 %
Reg. 12- SOCCSK SARGEN	2,233,730	293,226.24	122,196.43			13.1272 %
Reg. 13- Caraga Reg	2,147,835	160,176.75	69,112.70			7.45759 %
ARMM	3,351,142	160,150.45	48,160.99			4.77898 %
Sub Total	13,500,342	1,005,929.05				7.45114
GRAND TOTAL	34,289,876	3,128,631.01	1,855,982.17			9.12407

According to the Philippine Standard Geographic Code, dated September 30, 2017 and December 31, 2017, there are 17 Regions, 81 Provinces, 145 Cities and 1,489 Municipalities. The National Capital Region, with a total land area of 63,600 thousand hectares, and composed of 17 Cities, namely, Quezon City, Caloocan City, Pasig City, Valenzuela, Paranaque, Taguig, Muntinlupa, Las Pinas, Malabon, Manila, Marikina, Makati, Pasay, Pateros, Mandaluyong, Navotas, and San Juan will be the first to go hungry since they do not have rice production area and are totally dependent on the supply coming from nearby provinces.

Region 3 Central Luzon has the biggest land area devoted to rice production at 483,830.18 or 22 of its total land area and the biggest irrigated area at 314,193.28hectares. The second is Cagayan Valley at 457,246.76 hectares and an irrigated area of 293,004.21 hectares.

Production land for rice is slowly diminishing and from year 2012 to 2016 the decrease in number of hectares planted and harvested to rice is quite noticeable.

AREA (Harvested (million/ha)					
Year Covered	2012	2013	2014	2015	2016
TOTAL	4.69	4.75	4.74	4.66	4.56

Based on the CROPS: AREA PLANTED/HARVESTED, PHILIPPINES, 2012-2016 (*Selected Statistics on Agriculture is a publication of the Philippine Statistics Authority*), there were about 4.690.1 million hectares planted in 2012. In 2013, the area increased by 56 hectares. But in 2014, it declined by 6.4 hectares and from then on, it was a continued decrease of 83.50 hectares and 100.2 in 2015 and 2016 respectively. What was the cause of the decrease in area planted and harvested? Was it converted to non-agricultural use that's why it was not planted/cultivated? That is the most plausible reason why NIA did not purposely include in their tabulated report how many hectares were converted in 2013 to 2016.. NIA must be mandatorily directed to supply the actual number of irrigated, irrigable and rainfed areas that were converted to be able to come up with credible projections.

AREA (Harvested (million/ha)					
Irrigated	3.16	3.24	3.25	3.23	3.18
Rainfed	1.53	1.51	1.49	1.42	1.37
	(1,526,876)	(1,509,754)	(1,486,592)		
JANUARY-JUNE	2.04	2.04	2.10	2.06	1.93
Irrigated	1.49	1.53	1.54	1.53	1.47
Rainfed	0.55	0.52	0.56	0.53	0.46
JULY-DEC	2.65	2.70	2.64	2.59	2.63
Irrigated	1.67	1.71	1.72	1.70	1.71
Rainfed	0.98	0.99	0.92	0.89	0.92

Upon careful perusal of the data included in the PSA Report for 2017, the total area that can be planted and harvested to rice was indicated at 4.556 million hectares and out of this, the total Irrigated Area is 1,855,982.17 million hectares. Irrigated lands are capable of producing rice for 2 and sometimes 3 cropping seasons. The figures shown in the January-June (dry) cropping season, only 1.47 million hectares of irrigated lands were planted and harvested. Subtract this figure to the total irrigated area, and a difference of 385,982.17 would come out. The same shortfall happened in July-December (wet) cropping season. Out of 1,855,982.17 million hectares of irrigated lands, only 1.71 million hectares was planted and harvested. Again what happened to the difference of 145,982.17 hectares? What happened to these irrigated lands funded by the government to have irrigation water to achieve 2 or even 3 croppings and increase rice production? Were they converted, or simply not planted because the farmers did not have the money to sustain the production cost? The optimum potentials of these lands to produce were not achieved. The yield in these areas could have greatly help sustain the rice needs of the country.

Also missing is the Total Irrigable Area to be Developed posted at 1,272,648.83 million hectares. Irrigable areas are like rainfed areas. There is only one cropping season, the wet or rainy season since they are also totally dependent on rainfall. Were they ever planted even for the wet season or for the July-Dec cropping season? Again, there was no report on the Total Irrigable Area if they were ever planted or harvested and what was the volume of production?

On rainfed areas, from the total area of 1,427,369.00 million hectares, only 920,000 were harvested for the wet cropping season. How come 507,369 hectares were not planted and harvested for the wet seasons? With the million pesos intervention coming from different government agencies, for these areas to have ample supply of irrigation water, still so much ricelands lay wasted and unproductive.

The omission on the yearly report by the PSA is a very serious matter. On the 1,272,648.83 million hectares total Irrigable Area alone, million tonnages of rice is missing and possibly not included in the annual production rice report. Was it purposely done to make it appear that we are not producing enough, to give reason for rice importation?

Total Irrigable lands	Yield per hectare July-Dec. 2016(wet season)	Total Production in Palay & Rice	Equivalent in Rice @ 65% recovery)
1,272,648.83	3.18mt (palay)	4,047,023.279mt.	
	2.067 (rice)@ 65% recovery		2,634,383.mt.

Another factor that greatly contributes to the diminishing riceland is CONVERSION. The reality on the ground speaks undoubtedly that conversion of riceland to residential, commercial, industrial and other non-agricultural uses remains unabated despite the provision in RA 9700 (Sec. 22) That irrigated and irrigable lands, shall not be subject to conversion. The provision of the law is well enshrined for the protection of these lands, and yet conversion is persistently happening.

Yearly Conversion of Irrigated or Irrigable lands

Year	Estimated Irrigable Area	TOTAL Irrigated Area	Remaining Area to be Developed	Permanentl y Non-Restorable
2016	3,128,631.00	1,855,982.17	1,272,648.83	?
2015	3,019,609.00	1,731,128.29	1,315,792.01	? +27,311.3
2014	3,019,609.00	1,708,063.35	1,311,545.64	?
2013	3,019,608.99	1,678,595.36	1,341,013.63	?
2012	3,126,340.00	1,626,530.35	1,392,694.50	107,115.15
2011	3,126,340	1,570,926	1,450,601	104,810

2011 Converted & Permanently Non-Restorable Areas		2012 Converted & Permanently Non-Restorable Areas	
REGIONS	Total Area (in hectares)	REGIONS	Total Area (in hectares)
CAR	2,325	CAR	2,324.50
1	15,912	1	15,757.83
2	15,805	2	15,860.53
3	19,156	3	18,024.19
4-A	10,428	4-A	10,871.00
4-B	10,531	4-B	10,531.05
5	223	5	223
LUZON	74,380	LUZON	73,592.10
Reg. 6	7,365	Reg. 6	7,433.20
7	4,363	7	4,513.65
8	291	8	299
VISAYAS	12,019	VISAYAS	12,245.85
Reg. 9	1,122	Reg. 9	1,128.00
10	4,650	10	7,068.08
11	2,297	11	2,297.00
12	6,851	12	7,171.32
13	2,978	13	3,098.25
ARMM	515	ARMM	514.55
MINDANAO	18,413 Hectares	MINDANAO	21,277.20
Grand Total	104,812	Grand Total	107,115.15

Based on DAR's initial data, some 222,000 hectares of agricultural land were converted to residential, commercial, and industrial use between 1988 and June 2016. BUT in 2011 and 2012 alone, converted lands by Region and by Province was aptly provided by NIA in the yearly Status of Irrigation Development, and it showed that for the said two years, the 200 thousand mark was already hit. Converted lands ware classified by NIA as Permanently Non-Restorable Areas and in 2011, 104,812 hectares were converted and Region 3 has the biggest land area converted at 19,156 hectares of irrigated lands.

In 2012, a total of 107,115 hectares of irrigated lands was again converted and Region 3 ranked first as having the biggest at 18,024.19 hectares. From 2003 to 2007, an average of 900 hectares of the total rice area harvested were converted annually. These figures are just emanating from one agency-NIA, what about the real numbers of converted irrigated and irrigable riceland? DAR has to say its piece and be accountable especially after the enactment of RA 9700 in 2009, where it was categorically provided that "irrigated and irrigable lands, shall not be subject to conversion".(Sec. 22).

It is highly questionable and improbable that in years 2013, 2014, 2015 and 2016, there were NO irrigated and irrigable areas that were converted. NIA made sure in their report that the Total Irrigated Area and the Remaining Area to be developed would result to the Total Estimated Irrigated & Irrigable Area, to impart that there was no conversion. NIA did not even provide the number of Irrigated and irrigable areas. The two classification of Riceland has a lot of difference in terms of production capacity. Irrigated lands have two(2) distinct cropping seasons.(sometimes it can even be 3) while the irrigable areas are like the rainfed areas has only one cropping season (wet) since it only depends on rain water and has not been developed yet to be able to access irrigation water from the system. The National Irrigation Administration has to provide and come up with real figures or else everything will be suppositions.

It is high time that those who were tasked for the protection of these lands, BUT knowingly or willfully violates the provisions of the Agrarian Law specifically that pertains to the conversion of the remaining lands that are producing the staples must be made to suffer the consequences of his acts. We are talking here of food availability and security of the next generations. Money, to line their pockets in exchange of the future foods needs of the entire nation is totally condemnable and an abominable offense.

Rice availability and self-sufficiency MUST NOT be reduced only in numbers, data and statistical tabulations. The threat of hunger and malnutrition is real and there is a paramount consideration that within the realm and concept of environmental science, the conversion of productive agricultural lands to other land use is categorized as one of the major environmental degradation.

B. PRODUCTION CAPACITY/YIELD

Rice production in the Philippines has been growing at an average rate of 1.9% per year over the last decade compared to 2.0% and 5.4% for Thailand and Vietnam, respectively. Philippine rice productivity (in terms of palay produced per hectare) has been relatively stagnant, increasing by an average of only 0.43% yearly over the last decade. Thailand's rice productivity has increased by 1.24% and Vietnam's by 3% yearly over the last 10 years. *(Excerpts from "101 Facts About Rice in the Philippines", compiled by V. Bruce J. Tolentino, Beulah de la Pena, Elcee Noveno, Benedicto Rayco and Irene Villapando, November 1, 2001*)

The Philippine Rice Research Institute indicates that the Philippines has only exploited a quarter of its full potential capacity in rice yields. Actual yields average only 3 tons per hectare (60 cavans@50kgs/cavan) while potential is 12 tons per hectare. (240 cavans at 50kgs/cavan) and the increase in yield may be attributed to the sustained use of high yielding varieties coupled with sufficient water supply during the early stages of crop development. The increase in harvest area can also be attributed to adequate water and availability of high yielding varieties (HYV) seeds and fertilizer support from DA and LGUs during the cropping period The Philippines has so-called "Certified" and "Hybrid" seeds that yield 4.7mt (94 cavans) and 6.5 mt/hectare (130 cavans), respectively.

VOLUME OF PRODUCTION,PHILIPPINES, 2012-2016

Year Covered	2012	2013	2014	2015	2016
Palay	18,032.5	18,439.4	18,967.8	18,149.8	17,627.2

BREAKDOWN OF PALAY: PRODUCTION, (million mt)

Year Covered	2012	2013	2014	2015	2016
TOTAL	18.04	18.44	18.97	18.15	17.63
Irrigated	13.40	13.82	14.41	13.94	13.54
Rainfed	4.64	4.62	4.56	4.21	4.09
% contribution of Rainfed to Total Rice Production	25.7%	25%	24%	23%	23%
JANUARY-JUNE	7.89	8.00	8.38	8.32	7.65
Irrigated	6.37	6.56	6.87	6.92	6.48
Rainfed	1.52	1.43	1.51	1.40	1.17
JULY-DEC	10.14	10.44	10.59	9.83	9.98
Irrigated	7.02	7.26	7.54	7.02	7.06
Rainfed	3.12	3.18	3.05	2.81	2.92

RICE PRODUCTION PER REGION (2016)

REGIONS	Area Used for Rice Production		Production per Region ('000 mt)	% of PRODUCTION YR. 2016	
PHILIPPINES				17,627.2 ('000 mt	
LUZON (%)	None				
NCR	111,295.65				
CAR	264,491.00	96,227.54	382,510.24	2.17	
Ilocos Region	457,246.76	188,519.32	1,805,025.28	10.24	
Cagayan Valley	483,830.18	293,004.21	2,332,078.56	13.23	
Central Luzon	85,929.00	314,193.28	3,342,117.12	18.96	
CALABARZON	143,558.95	60,903.00	407,188.32	2.31	
MIMAROPA	239,440.00	91,344.52	1,080,547.36	6.13	
Bicol Region	1,785,791.54	138,723.49	1,276,209.28	7.24	
Grand Total			10,625,676.16	60.28%	
VISAYAS	191,253.17				
Western Visayas	53,674.35	121,953.32	1,443,667.68	8.19	
Central Visayas	91,982.90	48,710.00	176,272	1.00	
Eastern Visayas	336,910.42	71,924.65	955,394.24	5.42	
NegrosIsland			507,663.36	2.88	
Grand Total	93,706.00		3,082,997.2	17.49	
MINDANAO	121,122.69	50,639.54			
Zamboanga Peninsula	177,546.92	70,565.66	569,834.1	3.30	
Northern Mindanao	293,226.24	69,803	712,138.88	4.04	
Davao Region	160,176.75	122,196.43	417,765,114	2.37	
SOCCSKSARGEN	160,150.45	69,112.70	1,200,276.12	6.81	
Caraga	1,005,929.05	48,160.99	461,832.64	2.62	
ARMM	3,128,631.01		687,460.8	3.09	
		1,855,982.17	3,916,763.84	22.22	
GRAND TOTAL			17,625,437.20		

From the data above, it can be surmised that the biggest rice producer is Region 3 is the biggest rice producer and it harvested 3,342,117.12 million metric tons in 2016. The entire island of Luzon produced 10,625,676.16 MT or 60.28% of the total national rice production. The land area of Luzon is about 104,688 km² and the population as of 2015 has reached 57,470,097 million.

YIELD PER HECTARE BY ECOSYSTEM, BY SEMESTER, PHILIPPINES, 2012-2016 (mt)

Year Covered	2012	2013	2014	2015	2016
TOTAL	3.84	3.89	4.00	3.90	3.87
Irrigated	4.24	4.27	4.43	4.31	4.26
Rainfed	3.04	3.06	3.07	2.96	2.97
JANUARY-JUNE	3.88	3.91	3.99	4.04	3.96
Irrigated	4.28	4.30	4.47	4.51	4.40
Rainfed	2.78	2.77	2.69	2.65	2.55
JULY-DEC.	3.82	3.86	4.01	3.79	3.80
Irrigated	4.20	4.24	4.39	4.13	4.13
Rainfed	3.18	3.21	3.30	3.14	3.18

3

To get the average yield of Irrigated lands- Add the Jan to June yield(dry) 4.40 and July to Dec. 4.13 (wet). The sum divided by 2 will give the average. Ex. 4.40+4.13=8.53 divided by 2= 4.265

CONTRIBUTION OF RAINFED AREAS IN RICE PRODUCTION (million mt)

Year Covered	2012	2013	2014	2015	2016
TOTAL Rice	18.04	18.44	18.97	18.15	17.63
BREAKDOWN					
Irrigated	13.40	13.82	14.41	13.94	13.54
Rainfed	4.64	4.62	4.56	4.21	4.09
% contribution of Rainfed to total Rice Production	25.7%	25%	24%	23%	23%

(Add the Irrigated and rainfed production= Total rice production per year)

The contribution of RAINFED areas in rice production must not be discounted. Though the rainfed areas are constantly diminishing because it is not considered as irrigable area and presently being subjected to rampant conversion, the average contribution of rainfed areas from 2012 to 2016 is 4.424 million MT or 24.24% of the total average rice production. Rainfed areas' contribution and importance to rice sufficiency MUST NOT BE OVERLOOKED or simply taken for granted.. The 4.556 million hectares planted and harvested to rice includes the rainfed areas with 1,427,369 million hectares, so if these lands will not be protected, we will be losing million metric tons of rice each year.

Not to be outdone in terms of palay production, a rainfed rice farm that used to produce only about 50 cavans per hectare can yield four times, or 200 cavans. At the Simon's Farm in Brgy. Luna in Santiago, Isabela where Dennis Miguel implemented the System for Rice Intensification (SRI) technique developed by Cornell University experts, he was able to produce 10.8 tons of palay (fresh weight) per hectare. That's equivalent to 216 cavans per hectare (10.8 tons of palay X 1,000 kgs/ton = 10,800 kgs divided by 50 kgs/cavan= 216 cavans). So, the yield capacity of rainfed areas that produced rice only in one cropping season can be enhanced. The result is an eye-opener. It means that the rainfed areas in many

parts of the Philippines can be made to produce high yields by following the System of Rice Intensification. While adopting the SRI can be demanding, it is one way of ensuring viable income and food security among smallholder farmers. (*Manila Bulletin Published April 27, 2017, 12:05 AM By Zac B. Sarian)*

Now that it has been proven that a one-hectare rainfed farm can produce the usual yield of four hectares, there is no more reason why rainfed areas should not be protected the same way that the irrigated areas must be protected in perpetuity.

Regions	Land Area	Area Used for Rice Production (ETIA)	% of Production Land vs. Land area	Annual Rice Production	Total Population	Total Rice Consumption
LUZON						
NCR	63,600				12,877,253-(12.75%)	1,578,493.673
CAR	1,942.220	111,295.65	0.0573	248,631.66	1,722,006- (1.71%)	211,083.954
Reg. 1-Ilocos	1,301,260	264,491.00	0.02032	1,173,266.43	5,026,128-(4.98%)	616,102.770
Reg. 2-Cagayan	2,822,883	457,246.76	0.01620	1,515,851.06	3,451,410- (3.42%)	423,073.838
Reg. 3-C. Luzon	2,201,463	483,830.18	0.02198	2,172,376.13	11,218,177-(11.11%)	1,375,124.137
Reg. 4A-CALABARZON	1,687,331	85,929.00	0.00509	264,672.41	14,414,774-(14.27%)	1,766,962.997
Reg. 4B-MIMAROPA	2,962,087	143,558.95	0.00484	702,355.78	2,963,360-(2.93%)	363,248.668
Reg. 5- Bicol	1,815,582	239,440.00	0.01318	829,536.03	5,796,989-(5.74%)	710,594.911
Sub Total	12,856,148	1,785,791.54		6,906,689.50	57,470,097	7,044,684.95
VISAYAS						
Reg. 6- Western Visayas	2,079,418	191,253.17	0.00920	938,383.992	4,477,247	548,820.937
Reg. 7- Cental Visayas	1,588,597	53,674.35	0.00338	114,576.8	6,041,903	740,616.469
Reg. 8- Eastern Visayas	2,325,110	91,982.90	0.00396	621,006.256	4,440,150	544,273.587
Negros Island		336,910.42		329,981.184	4,414,131	539,759.938
Sub Total	5,993,125			2,003,948.23	19,373,431	2,373,470.93
MINDANAO						
Reg. 9-Zamboanga Pen.	1,682,291	93,706.00		370,392.165	3,629,783	444,938.800
Reg. 10- Northrn Mindanao	2,049,602	121,122.69		462,890.272	4,689,302	574,814.639
Reg, 11- Davao Reg	2,035,742	177,546.92		271,547.324	4,893,318	599,822.920
Reg. 12 SOCSK SARGEN	2,233,730	293,226.24		780,179.478	4,545,276	557,159.932
Reg. 13- Caraga Reg	2,147,835	160,176.75		300,191.216	2,596,709	318,304.589
ARMM	3,351,142	160,150.45		446,849.52	3,781,387	463,522.418
Sub Total	13,500,342	1,005,929.05		2,632,049.98	24,135,775	2,958,563.30
GRAND TOTAL	32,349,615	3,128,631.01		11,542,687.71	100,979,303	12,376,719.18

Additional production for one cropping per year can be achieved as long as there is an increase in the irrigated area. It may take ten years to fully develop the irrigation system for the 1,272,648.83 but

at least the government is consistent enough to put funding to alleviate the shortage of rice due an ever increasing population. If the population growth can at least be tamed a little bit, such that per hectare yield can feed

A. POPULATION GROWTH

There are so many mouths to feed in the Philippines that rice production needs to cope up or else there will be mass hunger and starvation in the years to come.

The Phil. population is constantly increasing BUT agricultural lands planted to rice are slowly diminishing. According to the International Rice Research Institute (IRRI), one of the major challenges of the Philippines is how to keep up with a rapidly growing population.

Year Covered	2012	2013	2014	2015	2016
POPULATION (million persons)	96.51	98.20	99.88	100.98	103.24

Source: PSA-*2015CensusofPopulationresult*

"The population of the Philippines is estimated at 103 million in 2016. Its annual growth rate of around 2 percent—among the world's highest—means that just to keep pace with growing demand for rice, the country would have to increase rice production and yield at rates rarely seen in history," IRRI said.

Vietnam, with a land area slightly bigger than the Phils. at 31,007 million hectares has a population only of 94,569,072 as of 2016 and a yearly growth rate of 1.07 % and the government has even projected that it will decrease by 2017-2018 and it will only hit the mark of the 2016 population of the Phils. in 2025 at 102,763.511.

Thailand on the other hand, has a land area of 51,312 million hectares but the population is only 68,863,514 in 2016 with a percentage growth of a mere 0.030 percent. To augment the demand for rice due to the yearly shortfall in production, the Phils. imports additional tonnage from Thailand and Vietnam.

The Philippines feeds 20 people per hectare of harvested area. Thailand feeds six (6) people while Vietnam feeds 12. The area planted to rice is also big compared to the 4.56 million hectares in the Phils. Thailand has 10.96 million hectares and Vietnam has 7.44 million hectares planted to rice and their respective government takes the issue on rice seriously since rice production in Thailand represents a significant portion of the Thai economy and labor force. Forty percent of Thais work in agriculture, 16 million of them as rice farmers. While the Phils. has 2.1 million rice farmers (*Sources: Department of Agriculture and Rice Figures in the Philippines and Philippine Rice Industry Primer consolidated and published by Philippine Rice Research Institute*

TABLE_I__Projected 10 Year Population Growth & Required Palay Production & Rice Consumption

Year	Population (million)	Population Increase /annum (million)	Rice Consumption-Million (MT)	Equivalent Palay Production Million (MT)
2016	103.240		12.595	19.377
		(+) 2.064	*[0.252]*	*[0.387]*
2017	105.305		12.847	19.765
		+2.106	*[0.260]*	*[0.395]*

2018	107.411		13.104	20.160
		+2.148	*[0.262]*	*[0.403]*
2019	109.559		13.306	20.563
		+2.191	*[0.267]*	*[0.411]*
2020	111.750		13.634	20.975
		+2.235	*[0.273]*	*[0.419]*
2021	113.985		13.906	21.394
		+2.280	*[0.278]*	*[0.428]*
2022	116.265		14.184	21.822
		+2.325	*[0.284*]	[*0.437]*
2023	118.590		14,468	22.259
		+2.372	*[0.289]*	[*0445]*
2024	120.962		14.757	22.703
		+2.419	*[0.295]*	*[0.454]*
2025	123.381		15.053	23.159
		+2.468	*[0.301]*	*[0.463]*
2026	125.849		15.354	23.622

a) Population Data: Source-*2012 to 2014 and 2016 data are 2010 Census-based population projections; 2015 Census of Population result*
b) Forecasted 2% population growth-*Increment, cumulative per annum*
c) Average rice consumption per head@122kgs= 0.*122mt per annum*
d) Rice recovery factor 0.*65% from palay production*
e) 5 year hence, 2021 with a forecasted population base of 113.985 million would require a palay production of 21.394 million metric tons from all types of rice lands (irrigated, irrigable & rainfed) to sustain the rice needs of the population.
f) 10 year hence, 2026, with a forecasted population base of 125.849 million would require a palay production of 23.622 million metric tons from all types of rice lands (irrigated, irrigable & rainfed) to sustain the rice needs of the population.
g) Plotted against the projected population base of 118.590 million Filipinos, 22,259 million metric tons of palay would sufficiently sustain the population rice requirement of projected year 2023., with a little surplus.

Now that the rice consumption is outpacing harvest and the production can't catch up with the population growth, what do you think will happen 10-20 years from now? The country must not depend on rice importation and depend on other countries to support our staple needs. What if they can no longer export rice because their own populace needs it? It happened to us in 2008. Converted lands can no longer feed hungry people. In 2008, the Philippines which is currently the largest importer of rice in the world, imported around 1.8 million tons of rice. *(World Rice Statistics*).

Population, Consumption per Region VS. Palay, Rice Production

REGIONS	Population (2015)	Annual Rice Consumption x Population (122.58 kilos, per person annually)	Production per Region (2016)PALAY	Production per Region-RICE (.65% Conversion)	Surplus	DEFICIT
PHILIPPINES	100,979,303	12,378,043Mmt	17,627.2 ('000 mt			
LUZON						
NCR	12,877,253	1,578,493.673				1,578,493.673

CAR	1,722,006	211,083.954	382,510.24	248,631.66	37,547.706	
Ilocos Region - I	5,026,128	616,102.770	1,805,025.28	1,173,266.43	557,163.66	
Cagayan Valley II	3,451,410	423,073.838	2,332,078.56	1,515,851.06	1,092,777.222	
Central Luzon - III	11,218,177	1,375,124.137	3,342,117.12	2,172,376.13	797,251.993	
CALABARZON IV-A	14,414,774	1,766,962.997	407,188.32	264,672.41		1,502,290.587
MIMAROPA- IV-B	2,963,360	363,248.668	1,080,547.36	702,355.78	339,107.112	
Bicol Region - V	5,796,989	710,594.911	1,276,209.28	829,536.03	118,941.119	
Sub Total	57,470,097	7,044,684.95	10,625,676.16	6,906,689.50	2,942,788.81	3,080,784.26
VISAYAS						
Western Visayas - VI	4,477,247	548,820.937	1,443,667.68	938,383.992	389,563.06	
Central Visayas- VII	6,041,903	740,616.469	176,272	114,576.8		626,039.67
Eastern Visayas- VIII	4,440,150	544,273.587	955,394.24	621,006.256	76,732.67	
Negros Island	4,414,131	539,759.938	507,663.36	329,981.184		209,778.75
Sub Total	19,373,431	2,373,470.93	3,082,997.2	2,003,948.23	466,295.73	835,818.42
MINDANAO						
Zamboanga Pen- IX	3,629,783	444,938.800	569,834.1	370,392.165		74,546.635
Northern Mndnao- X	4,689,302	574,814.639	712,138.88	462,890.272		111,924.367
Davao Region-XI	4,893,318	599,822.920	417,765,114	271,547.324		328,275.596
SOCSKSARGEN-XII	4,545,276	557,159.932	1,200,276.12	780,179.478	223,019.546	
Caraga- XIII	2,596,709	318,304.589	461,832.64	300,191.216		18,113.373
ARMM	3,781,387	463,522.418	687,460.8	446,849.52		16,672.898
Sub Total	24,135,775	2,958,563.30	3,916,763.84	2,632,049.98	223,019.546	549,532.87
GRAND TOTAL	100,979,303	12,376,719.18	17,625,437.20	11,542,687.71	3,632,104.09	4,466,135.55

Formula: To get Total Consumption per Region-Multiply population by 122.58
To convert Palay Production to Rice- Multiply Total Palay Production by .65%;
To get Surplus or Deficit- Subtract Annual Rice Consumption to Rice Production
To get the Total Deficit: Subtract Rice Production to Rice Consumption-11,542,687.71-12,376,719.18=(-834,031.47)
Or Subtract Surplus to Deficit: 3,632,104.09-4,466,135.55=(-834,031.47)

Population Data based on the 2015 Census of Population) which was release on June 10, 2016

D. INFRASTRUCTURE

Can the remaining 4.56 million hectares (as of 2016) of land being used for rice production sustain the rice needs of the growing population?

YES, and the answer lies on the ability and political will of the government to sustain the yearly development of the irrigation system for the irrigable and lowland rainfed areas and provide the necessary funding thereof. The government must undertake a major expansion of the nation's irrigation system.

Total Area Planted to Rice *(As of 2016)*	4,556.000.00
Total Irrigated Area	1,855,982.17
Total Irrigable Area to be Developed	1,272,648.83
Total Rainfed Area	1,427,369.00

(*Source PSA and NIA*)

Based on the inventory as of- Dec. 31, 2016, out of 4.56 million hectares being planted to rice, estimated irrigated and irrigable areas is 3,128,631 million hectares. Only a total of 1,855,982.17 hectares are actually irrigated and the remaining areas to be developed and considered irrigable lands stands at 1,272,648.83 million hectares. The remaining 1,427,369M are those that are considered rainfed areas and has only one cropping season.

Can the Development of the Irrigation Systems Help to Increase Rice Production?

Farming was already considered as a way of life for Filipinos during the pre-hispanic time but they solely depended on rainfall or floodwaters in the cultivation of their crops. It later evolve and the importance of irrigation development to the production of food crops started, first, with the building of the rice terraces. During the Spanish rule, irrigation systems were first built on Friar lands around Manila or in the provinces of Bataan, Bulacan, Rizal Cavite and Laguna and thirty (30) irrigation projects servicing 27,681 hectares, costing around 6.13 million pesos were constructed. Cavite has the most number of irrigation system built. 18 irrigation systems servicing 18,000 hectares or 60% of the total irrigation systems and 65% of the aggregate irrigated area (27,681 has).

The Prenza irrigation system (prinza-means dam) built in Marilao,Bulacan in 1875, service 830 hectares of riceland in the areass still operational and part of the integrated Angat-Maasim River Irrigation System. To show that there were already an irrigation systems existing in during the Spanish Regime (1875), the following is tabulated:

Irrigation Systems Constructed in Friar Lands

PROVINCE	ESTATE	No. of Irrigation System	Area Irrigated (Has)
Laguna	Binan	3	1,370
	Calamba	3	880
	Sta Rosa	2	2,000
Cavite	Imus	8	7,500
	Naic	3	4,000
	Samn Francisco deMalabon	4	6,000
	Sta Crus de Malabon	3	3,500
Bataan	Orion	1	521
Bulacan	Lolomboy-Sta Maria de Pandi	2	1,850
Rizal	Muntinglupa	1	60
TOTAL-5 Provinces	10 Municipalities	30-Irrigation Systems	27,861 Hectares

It is very ironic that the development of irrigation system that started some 142 years ago, but until now we only have developed and irrigated 1,855,982.17 million hectares of rice lands. That's about a measly 12,875.36 hectares a year! *(1,855,982.17 -27,681=1,828,301.17 divided by 142 years=12,875.36 has per year).* The government's major expansion of the nation's irrigation system happened sometime in mid-1960 when the area under irrigation grew from under 500,000 hectares to 1.5 million hectares in 2009, almost half of the potentially irrigable land inventoried..(3,128,631 million hectares) At the peak of irrigation development in the 1970s, the National Irrigation Administration (NIA) was able to build new irrigation facilities at the rate averaging 25,000 hectares per year.

The area under irrigation grew from under 500,000 hectares in the mid-1960s to 1.5 million hectares in 2009. The Philippines has about 10.3 million ha agricultural lands. Out of this, around 3.1 million hectares are considered irrigable, with up to 3 percent slope, and primarily devoted to rice. In 2016, NIA reported that the areas irrigated are now 1,855,982.17 or to round it off, around 1.86 million hectares. A study by the World Bank, however, identified more than 6.1 M hectares as irrigable, including areas that are relatively more difficult to irrigate and up to 8 percent slope. Estimated Total Irrigation Area (ETIA) is based on the 3% slope criteria.–(Source: NIA 2017- Status of Irrigation Development)

The increase in irrigation water comes from four (4) sources or four categories of irrigation systems, namely; National Irrigation System, Communal Irrigation System, Private Irrigation System and Other Govt. Agency Assisted Projects.

National irrigation systems (NIS) are large and medium schemes. These are basically operated and maintained by NIA where beneficiaries are charged irrigation service fee for the services rendered in the delivery of water. In the 1980s, joint management of portions of national systems with irrigators associations (IA) was effected.

Yearly Increase in the National Irrigation System (NIS) Irrigated Areas

YEAR Covered	TOTAL Irrigated Area	National Irrigation System	Yearly Increase in Hectares	Yearly % Increase	%Contribution to the Total Irrigated Area.
2016	1,855,982.17	848,617.31	93,951.73	12.45%	45.72%
2015	1,731,128.29	754,665.58	4,496.84	0.60%	43.59%
2014	1,708,063.35	750,168.74	9,955	1.34%	43.92%
2013	1,678,595.36	740,213.74	17,630.59	2.44%	44.10%
2012	1,626,530.35	722,583.15	9,793.15	1.37%	44.42%
2011		712,790			

Source: NIA
Formula: Subtract the 2016 contribution of NIA (848,617.31) to the previous contribution (2015-754,665.58), the difference is the increase in the area irrigated. To get the percentage, divide the increase area to the to the previous total NIS contribution. Ex. 93,951.73 divided by 754,665.58=12.449. The area irrigated in 2016 increased by 12.449% from the previous year (2015) total area irrigated bt NIS

Noticeable is the increase in 2016 of the irrigation water contribution coming from the National Irrigation System (NIS) which is under the administration, rehabilitation and development by the National Irrigation Administration. All the other contributors has also shown a marked increase in the number of hectares that their respective system has supplied and distributed that formed part of the Total Irrigated Area (TIA)

Communal irrigation systems (CIS) are small-scale schemes and constructed with the participation of farmer-beneficiaries thru their Irrigation Associations. The operation and maintenance (O&M) of CIS is turned over to IAs upon project completion subject to a cost recovery arrangement. Farmers amortize the chargeable cost for a period not exceeding 50 years at 0 percent interest. The repayment scheme is pre-arranged and acceptable to both NIA and the IA.

Private irrigation systems are those constructed, operated and maintained by private individuals or groups with or without technical assistance by NIA or other government agencies.

Other Govt. Agency Assisted Projects- these are projects that are being implemented by other government agencies like DAR, DA, BSWM and others that aimed to help farmers in their water needs for plant irrigation, like building of small water impounding areaor water catchment areas, providing

farmers with shallow tube wells and mechanized water pumps to augment and continuously supply the water for plant growth.

2016 Contributions of Four (4) Irrigation Systems			
Irriogation Contributors	2016 Total Contribution	Percentage of Contribution	
National Irrigation System	848,617.31	45.72%	
Communal Irriation System	648,416.64	34.94%	
Private Irrigation System	185,128.55	9.97%	
Other Govt. Agency Assisted	173,819.68	9.36%	
Total Irrigated Area	1,855,982.17		

NIA STATUS OF IRRIGATION DEVELOPMENT BASED ON INVENTORY
(In Hectares)

Year	Estimated Irrigable Area	Firmed Up Service Area								
		National Irrigation System	Communal Irrigation System	Private Irrigation System	Other Govt. Agency Assisted	TOTAL Irrigated Area	Converted & permanently Non-Restorable	Total Service Area Developd	% Irrigated	Remaining Area to be Developed
2016	*3,128,631.0	848,617.31	648,416.64	185,128.55	173,819.68	1,855,982.17	?	1,855,982.17	59.32	1,272,648.83
2015	3,019,609.00	754,665.58	615,797.39	187,766.78	172,898.54	1,731,128.29	?	1,731,128.29	57.33	1,315,792.01*
2014	3,019,609.00	750,168.74	595,653.15	194,841.25	167,400.22	1,708,063.35	?	1,708,063.35	56.57	1,311,545.64
2013	3,019,608.99	740,213.74	576,419.15	194,620.25	167,342.22	1,678,595.36	?	1,678,595.36	55.59	1,341,013.63
2012	3,126,340.00	722,583.15	534,402.74	200,037.50	169,506.97	1,626,530.35	107,115.15	1,733,645.50	55.45	1,392,694.50
2011	3,126,340	712,790	496,442	193,814	167,880	1,570,926	104,810	1,675,739	53.60	1,450,601

Source: National Irrigation Administration (Status of Irrigation Development)
(For year 2015, the ETIA was 3,019,609.00 minus the total Irrigated (developed) Area of 1,731,128.29. would give a difference of 1,288,480.71 as the remaining area to be developed. But what was indicated in the tabulated report of NIA as the Remaining Area to be developed was 1,315,792.01. The difference of -27,311.3 hectares as reflected in the NIA Table came from CAR, Reg. 3, 6, 7, 10 & ARMM. Does it mean that the ETIA is increasing?)
*If the 27,311.3 hectares increase from the 7 Regions will be added to the 2015 ETIA the succeeding ETIA for 2016 should be 3,046,920.3 hectares. But what was indicated in the 2016 ETIA was 3,128,631.00 hectares. Again there is a difference of 109,022, instead of the 27,311.3 hectares only. Where did the additional ETIA of 81710.7 come from?
The increase in the estimated irrigated and irrigable areas would change entirely the areas that should be non negotiable for conversion and the Bill must include a proviso "that all other lands that are later found to be irrigable, but not included in the initial inventory of lands use in the production of rice shall also be subject to non negotiability clause for conversion.

As of 2016 there are about 1,272,648.83 hectares of irrigable lands that has yet to be developed. If ten percent (10%) of these lands will be irrigated or 127,264.88 hectares, there will be an additional rice production. Per hectare yield of irrigated land (Jan to June or dry season) is 4.40 mt or about 88 cavans of palay The additional irrigable area of 127,264 thousand hectares if irrigated, will produce a yield of 559,965.47 mt. (127,264.88 has x 4.40mt = 559,965.47 mt of palay) x (0.65=363,977mt of rice). The Philippines feeds 20 people per hectare of harvested area and rice consumption is at 122.58 kilos, per person annually. The additional 363,977mt of rice can feed 2,969,285 Filipinos. That's almost 3 million Filipinos yearly who can eat rice from the newly irrigated lands.

Year Covered	Total Irrigable area as of 2016	10% Yearly increase in Irrigation	Yield per hectare	Additional Increase in Yearly Production	% to Annual Rice Production	Annual Contribution to Palay Production
2017	1,272,648.83	127,264.88 hectares	4.40mt	559,965.47 MT of Palay=363,977MT of rice	0.032 %	(2016-17,627.200Mmt + 559,965.MT 18,187,165MT

Yearly Increase in Irrigation Areas and Corresponding Percentage Increase

Years Covered	TOTAL Irrigated Area	% Increase of Total Irrigated Area	Yearly Increase in Irrigated Area (in Has)	Yearly % Increase in irrigation	Remaining Area to be Developed	% of Area To Be Developed
2016	1,855,982.17	59.32%	124,853.88has	07.212 %	1,272,648.83	40.68%
2015	1,731,128.29	57.33%	23,064.94	01.351 %	1,315,792.01	43.57%
2014	1,708,063.35	56.57%	29,467.99	01.756 %	1,311,545.64	43.43%
2013	1,678,595.36	55.59%	52,065.01	03.001 %	1,341,013.63	44.41%
2012	1,626,530.35	55.45%	55,604.35	03.540 %	1,392,694.50	44.54%
2011	1,570,926	53.60%		xxx	1,450,601	xxx
			285,056.17 Has			

Formula to get the yearly % increase in irrigation (2016) 1,855,982.17-
(2016) 1,855,982.17- Total Irrigated Area
Minus -
(2015) 1,731,128.29 Total Irrigated Area
124,853.88 has. Increase in irrigated area from 2015 to 2016
To get the percentage increase per year: Divide the additional area irrigated (124,853.88has) to the previous Remaining Area to be Developed (1,731,128.29) the result would be the percentage increase of area irrigated. To check whether the percentage is correct, multiply the percentage (7.2122%) to the Total Irrigated Area irrigated from the previous year (2015-1,731,128.29), then the result will be the additional area irrigated for succeeding year (124,853.88has).

From the onset of 2012 to 2016, or for a period of 5 years, the total increase in irrigated hectarage was 285,056.17 hectares. From 2011 to 2015, the average increase or the total percentage growth was not so significant. But in 2016, the growth in irrigation development was quite remarkable at 7.212%! The maximum annual increase was 124,853.88 hectares. It only proves that if the government is really bent on increasing the yield or production of rice and sufficient funding is provided, the irrigation development can be optimized. If the trend continues, and irrigation of the remaining areas to be developed will increase, it will absolutely have an attendant effect in rice production. Irrigable areas are like rainfed areas that have only one cropping season (wet season). If irrigable lands will be irrigated, then it will have two cropping season (wet and dry) which will surely affect the total yield per hectare, thereby increasing the country's total rice production.

If the increase yearly (2012-2016) of the area irrigated and the corresponding percentages will be analyzed, it would show clearly that the government has not really done enough to increase the irrigation water supply from 2012 t0 2015. It was only in 2016 that an honest to goodness measures were implemented that's why the result posted in was a bit remarkable. Was the funding given to NIA from the National Budget in 2016 enough that they were able to build infrastructure needed to ensure the good flow of irrigation water?

With a very low percentage increase in irrigation development and very dismal increase in the irrigated area being added to the system, questions like, how much does NIA needs to at least increase the area being developed yearly by at least 10 percent? How much is the cost per hectare to be irrigated? Where does the yearly budget of NIA being spent. Is the poor performance of the NIA their reason for being? The primary consideration to increase the production of rice of the remaining irrigable areas and partly maybe of the lowland rainfed areas must take precedence in the budget allocation for NIA. If these will not be achieved, then the Philippines will really be reduced to become the biggest importer of rice since its production cannot sustain and feed the hungry mouth of its ever increasing populace.

For the year 2018, NIA got Php40.8 billion budget, higher by 6 percent than the P38.3 billion allotted for the irrigation in 2017. Bulk of the approved budget, or the Php26.8 billion, will be for the restoration, repair, and rehabilitation of existing irrigation facilities and construction and development of new irrigation systems. The agency is also eyeing to establish pump and special irrigation projects. NIA Chief Gen. Ricardo Visaya previously said that the increased budget will be used to accelerate and

complete ongoing projects and quickly develop and increase new irrigation areas. *"We want to increase the budget to fund the construction of our dams. We still have about 40.68 percent to be developed and we would like to fast track the development to help achieve rice self-sufficiency".* NIA, as of December 2016, has developed 1.85 million hectares of agricultural lands equivalent to 59.32 percent of irrigation development, BUT there is still remaining 40.67% or 1,272,648.83 hectares to be developed which has been determined and considered as irrigable areas having less than three (3) percent slope. But how many of the rice lands classified as rainfed areas totaling to about 1,427,369.00 hectares, with an elevation of more than 3 percent slope may be finally irrigated thereby increasing its yield or making it productive for two cropping season. Innovations in the system of irrigation may be developed in the next ten years and these rainfed areas can contribute largely to feed the increasing hungry Filipinos.

2016 Total Irrigated Area by Region

REGIONS	Total Land Area	Estimated Irrigable Area	Total Irrigated Area	% Developed	Remaining Area to be Developed	% Undeveloped
LUZON						
NCR	63,600	-	-	-	-	-
CAR	1,942,203	111,295.65	96,227.54	86.46%	15,068.11	0.1354%
Reg. 1-Ilocos	1,301,260	264,491.00	188,519.32	71.28	75,971.68	0.2872
Reg. 2-Cagayan	2,822,883	457,246.76	293,004.21	64.08	164,242.55	0.3592
Reg. 3-C. Luzon	2,201,463	483,830.18	314,193.28	64.94	169,636.90	0.3506
Reg. 4A CALABARZON	1,687,331	85,929.00	60,903.00	70.88	25,026.00	0.2912
Reg. 4B-MIMAROPA	2,962,087	143,558.95	91,344.52	63.63	52,214.43	0.3637
Reg. 5- Bicol	1,815,582	239,440.00	138,723.49	57.94	100,716.51	0.4206
Sub Total 14,732,809	12,856,148	1,785,791.54			602,876.18	
VISAYAS						
Reg. 6- W Visayas	2,079,418	191,253.17	121,953.32	63.77	69,299.85	0.3623
Reg. 7- C Visayas	1,588,597	53,674.35	48,710.00	90.75	4,964.35	0.0923
Reg. 8- E Visayas	2,325,110	91,982.90	71,924.65	78.19	20,058.25	0.2181
Sub Total	5,993,125	336,910.42			94,322.45	
MINDANAO						
Reg. 9-Zamboanga Pen.	1,682,291	93,706.00	50,639.54	54.04	43,066.46	0.4596
Reg. 10- N. Mindanao	2,049,602	121,122.69	70,565.66	58.26	50,557.03	0.4174
Reg, 11- Davao Reg	2,035,742	177,546.92	69,803	39.32	107,743.39	0.6068
Reg. 12- SOCCSK SARGEN	2,233,730	293,226.24	122,196.43	41.65	171,029.81	0.5833
Reg. 13- Caraga Reg	2,147,835	160,176.75	69,112.70	43.15	91,064.05	0.5685
ARMM	3,351,142	160,150.45	48,160.99	30.07	111,989.46	0.6993
Sub Total	13,500,342	1,005,929.05			575,450.20	
GRAND TOTAL	32,349,615	3,128,631.01	1,855,982.17	59.32%	1,272,648.83	0.4068%

Irrigation development should be distributed to the Regions who has the land capacity to improve its yield if irrigation water will flow in its rice fields. Reg. 2-Cagayan Region and Central Luzon has a remaining area to be developed at 0.3592 and 0.3506, respectively, but despite the absence of irrigation system on its 35% irrigable areas, the two Regions came out to be the highest rice producer at 2,332,078.56 million metric ton and 3,342,117.12, in 2016 and has the biggest surplus (1,092,777.222 and 797,251.993) after the rice consumption of its populace has been deducted. These surplus, with most probability went to the National Capital Region (NCR) composed 7 cities and municipalities with a total land area of 63,600 hectares and a population of 12,877,253. The NCR does not produce a single grain of rice and is totally dependent on the production of other regions to sustain the 1,578,493.673 million metric tons of rice consumption annually of its constituents. If worse comes to worst and the supply of rice is not sufficient to feed the entire nation, the first to suffer are the very poor and marginalized in the National Capital Region. The inhabitants of NCR may feel the pinch because of the price increase, but still, they can purchase their rice consumption because they have the money. But what about those who are mired in poverty. If they are hungry, they will steal, kill and do just about anything, so they can buy rice for their starving family. That's how important rice is. Not only to the economy but to the general wellbeing of a country, its people and the overall political and social stability.

Regions	Land Area	Area Used for Rice Production (ETIA)	% of Production Land vs. Land area	Annual Rice Production	Total Population	Total Rice Consumption
LUZON						
NCR	63,600				12,877,253-(12.75%)	1,578,493.673
CAR	1,942.220	111,295.65	0.0573	248,631.66	1,722,006- (1.71%)	211,083.954
Reg. 1-Ilocos	1,301,260	264,491.00	0.02032	1,173,266.43	5,026,128-(4.98%)	616,102.770
Reg. 2-Cagayan	2,822,883	457,246.76	0.01620	1,515,851.06	3,451,410- (3.42%)	423,073.838
Reg. 3-C. Luzon	2,201,463	483,830.18	0.02198	2,172,376.13	11,218,177-(11.11%)	1,375,124.137
Reg. 4A-CALABARZON	1,687,331	85,929.00	0.00509	264,672.41	14,414,774-(14.27%)	1,766,962.997
Reg. 4B-MIMAROPA	2,962,087	143,558.95	0.00484	702,355.78	2,963,360-(2.93%)	363,248.668
Reg. 5- Bicol	1,815,582	239,440.00	0.01318	829,536.03	5,796,989-(5.74%)	710,594.911
Sub Total	12,856,148	1,785,791.54		6,906,689.50	57,470,097	7,044,684.95
VISAYAS						
Reg. 6- Western Visayas	2,079,418	191,253.17	0.00920	938,383.992	4,477,247	548,820.937
Reg. 7- Cental Visayas	1,588,597	53,674.35	0.00338	114,576.8	6,041,903	740,616.469
Reg. 8- Eastern Visayas	2,325,110	91,982.90	0.00396	621,006.256	4,440,150	544,273.587
Negros Island		336,910.42		329,981.184	4,414,131	539,759.938
Sub Total	5,993,125			2,003,948.23	19,373,431	2,373,470.93
MINDANAO						
Reg. 9-Zamboanga Pen.	1,682,291	93,706.00		370,392.165	3,629,783	444,938.800
Reg. 10- Northrn Mindanao	2,049,602	121,122.69		462,890.272	4,689,302	574,814.639
Reg, 11- Davao Reg	2,035,742	177,546.92		271,547.324	4,893,318	599,822.920
Reg. 12 SOCSK SARGEN	2,233,730	293,226.24		780,179.478	4,545,276	557,159.932

Reg. 13- Caraga Reg	2,147,835	160,176.75		300,191.216	2,596,709	318,304.589
ARMM	3,351,142	160,150.45		446,849.52	3,781,387	463,522.418
Sub Total	13,500,342	1,005,929.05		2,632,049.98	24,135,775	2,958,563.30
GRAND TOTAL	32,349,615	3,128,631.01		11,542,687.71	100,979,303	12,376,719.18

CONCLUSION:

There are a lot of factors to be able to achieve food security/sufficiency in our staple, but the government and the people must work hand in hand to attain these through the following:

1. By preserving the rice producing lands by enacting an enabling law for its perpetual protection and conservation. It must be strictly non-negotiable to conversion to other uses. (Residential, commercial, industrial and nonagricultural uses and crop conversion. And in this score the following must be done:
   a. Totally STOP the conversion of irrigated, irrigable and rainfed areas planted to rice and certify as urgent HB No. 5501, sponsored by Speaker Pantaloons Alvarez, entitled, (An Act Prohibiting the Acceptance, Processing and Approval of Application for Land Use Conversion of Agricultural Lands, Irrigated Lands, Irrigable Lands to Non Agricultural Purposes).
   b. Certify as urgent the National Land Use Act Bill. The important provision pertains to the preservation in perpetuity and protection of irrigated, irrigable and rainfed areas under the Protection Land Use.
   c. Certify as urgent House Bill No. 1795, entitled, AN ACT FOR THE PROTECTION, CONSERVATION AND REHABILITATION OF WATERSHEDS SUPPORTING THE NATIONAL IRRIGATION SYSTEMS(NIS) TO ENSURE CONTINUOUS SUPPLY OF WATER FOR AGRICULTURAL PRODUCTION AND SELF-SUFFICIENCY IN FOOD AND PROVIDING FUNDS FOR THE PURPOSE, introduced by Cong. Luis Raymundo F. Villafuerte Jr.
   d. Oppose the total lifting of Quantitative Restriction QRs and Rice Tarrification .

2. By increasing the number of harvest areas across regions by providing sufficient water supply and government interventions in the provision of high yielding varieties of seeds and fertilizer support during the cropping period
3. By increasing the yield potential of rice in irrigated systems, reducing the crop maturity period to close the gaps in the rainfed systems;
4. By achieving yield stability by developing resistance against major insects and diseases in the modern high yielding varieties
5. By reducing farmer's dependence on harmful agrochemicals;
6. By increasing efficiency in the use of water, land, labor, and fertilizers.
7. And most importantly, the political will to control and manage the annual population growth as exemplified by Thailand during the 1970's up to the current times.

The land areas that must be protected, conserve in perpetuity as provided in the National Land Use Act Bill, are just a very small portion of the 34,289,876 million hectares that comprises the Philippine Islands. 4.56 million hectares used for the production of our staple is only 13.2983% of the total land area of the Philippines and there is a dire need to pass an enabling law that will ensure its perpetual protection. These land feeds the Filipinos and if conversion of these lands to non- agricultural uses cannot be abated, the next generation will suffer the consequences of malnutrition, hunger and starvation.

We have to act now and conserve and perpetually protect the remaining areas for production of our staple. At least, as a simple act of concern that would be our legacy to our children and the next generation.