Policy Brief
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National Land Use Policy: Protecting Prime Agricultural Lands

With only less than 10 million hectares of agricultural land that is threatened by a rapidly urbanizing economy, how would the Philippines be able to meet its growing demand for food, and continue providing rural employment to further reduce poverty? A national land use policy of protecting prime agricultural lands may be the answer.

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1. Introduction

Prime agricultural lands basically refer to the best agricultural lands. They are highly productive farm lands, very fertile and highly suitable for growing the country's major food crops and various agricultural products. These lands, however, tend to have the same characteristics that would also make them prime lands for urban development (Azadi et al. 2008, 3; Verzandvoort et al. 2009, 5). Because agriculture is almost always the least favored option when compared economically with major land developments, prime agricultural lands are very much prone to agricultural land use conversion.

To address this issue, the proposed National Land Use Act (NaLUA)[1] intends to protect all prime agricultural lands. The term "prime agricultural lands" for purposes of protection, however, has to be properly defined. This is to be consistent with NaLUA's overall framework of allocating scarce land resources to meet the requirements of a growing population not just for food, but also for housing, employment, and the need to protect the environment.

To better appreciate the policy deliberations on NaLUA's provisions on protecting prime agricultural lands, this paper will: (1) revisit the reasons for protecting agricultural lands in general, and prime agricultural lands in particular; (2) analyze the problems or implications of coming up with an appropriate and practical definition of prime agricultural lands; and (3) suggest some policy decision or criteria considerations in defining and identifying prime agricultural lands for purposes of protection. To provide the spatial dimension in discussing these aspects of the proposed national land use policy, this paper will refer to particular agricultural statistics per region mostly pertaining to information on land area, or inferring to economic location.

[1] Unless specified, this paper will refer to the proposed NaLUA or just NaLUA as any of the following: (1) priority bills filed in the 16th Congress, specifically Senate Bills (SB) 7, 63, 150 and House Bill (HB) 4382; (2) substitute bills filed in the 15th Congress, i.e., SB 3091 and HB 6545; and (3) Executive Branch's version of the NaLUA prepared by the NEDA Board - National Land Use Committee in 2010.

Table 1. Area of Farms by Land Use: 2002 (in hectares)

REGION	All Classes	Planted to Temporary Crops	Planted to Permanent Crops
Philippines	9,670,793	4,815,938	4,225,393
NCR	71,632	34,371	29,600
CAR	177,839	109,150	31,592
I	270,664	222,412	22,337
II	540,812	437,006	55,898
III	552,104	410,973	100,194
IV-A	588,516	149,648	408,947
IV-B	542,218	220,263	287,706
V	891,955	237,939	573,531
VI	666,917	497,446	128,140
VII	522,433	346,719	132,942
VIII	723,048	235,089	455,134
IX	785,294	339,145	420,408
X	746,901	382,993	303,599
XI	758,335	222,292	506,051
XII	775,309	497,812	221,400
CARAGA	523,407	189,994	312,152
ARMM	533,410	282,687	235,761

Source: CAF 2002, In Philippine Statistics Authority-Bureau of Agricultural Statistics (PSA-BAS) CountrySTAT.
Note: All other farm lands are either planted to permanent meadows/ pastures, covered with forest growth, lying idle, or not reported.

Table 2. GVA in Agriculture

REGION	Constant Prices (million PhP)		2013 % Share
	2012	2013	
Philippines	698,967	706,619	100
NCR	6,321	6,009	0.85
CAR	13,291	13,468	1.91
I	50,294	51,371	7.27
II	46,598	46,645	6.60
III	97,862	103,125	14.59
IV-A	69,444	72,094	10.20
IV-B	27,640	26,818	3.80
V	30,362	31,740	4.49
VI	65,798	63,637	9.01
VII	28,781	28,865	4.09
VIII	32,607	30,457	4.31
IX	29,697	29,916	4.23
X	59,469	61,376	8.69
XI	43,470	39,977	5.66
XII	51,452	53,262	7.54
CARAGA	16,136	17,382	2.46
ARMM	29,745	30,476	4.31

Source: PSA-NSCB (2013) Regional Accounts

2. Reasons for Protecting Agricultural Lands

The concept that agricultural land should be protected is not new. Many countries have actually tried to preserve agricultural lands from being converted to other uses.[2] The more developed countries have been more successful in protecting agricultural lands by making it a public policy, that is, by recognizing that land resources and its uses are too important to be left to the "whims of free-market forces". Faced with increasing population growth and rapid economic development, these countries were thus able to minimize or control unnecessary agricultural land use conversion, maximize land utilization, and properly manage overall urbanization development.

Some of the several reasons cited for protecting agricultural lands in general, and prime agricultural lands in particular, include the need to: (1) protect agriculture as a very important local industry, and enhance the potential of agriculture and agriculture-based industries to generate more jobs and further reduce poverty; (2) promote food self-sufficiency and maintain local food supplies; (3) ensure orderly urban development; and (4) enhance environmental amenities associated with open space (Hite and Dillman 1981, 45-46).

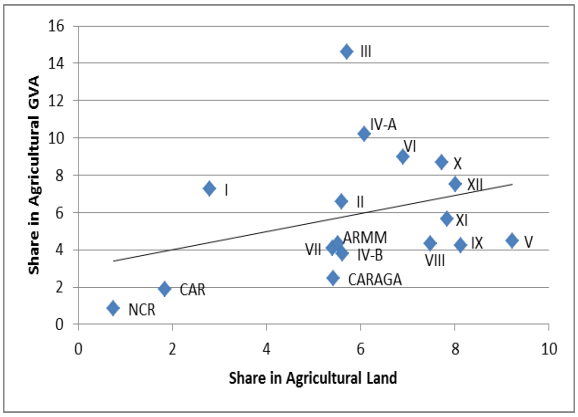
2.1. Protecting local agricultural industry

One of the major issues in development and physical planning is on the importance of agriculture and agribusiness to the economy, especially for rural areas. The local economic and social benefits that are derived from a viable agricultural industry thus form part of the basis for protecting agricultural land in a particular locality (Pasour 1982, 741).

Though agriculture in the Philippines contributed an average of only 10.75 percent to gross domestic product in 2012 to 2013, it drives agribusiness and various economic activities in other sectors. This raises the share that may be attributed to the agriculture industry by as much as 40 percent (see JICA 2012, 19; Habito 2010, 35); hence the enduring importance of agriculture. Such importance however varies vis-à-vis the country's national, regional, and/or local economic growth and development. Agriculture in Central Luzon and CALABARZON, for example, ranks very high in terms of national significance because of its large contribution to the national gross value added (GVA) in agriculture (Table 2). Agriculture in Bicol and Zamboanga

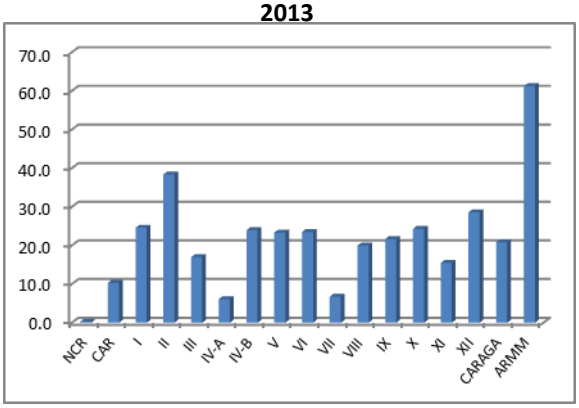
[2] Countries such as the United States (Hite and Dillman 1981), Canada (FEC 1977), Australia (Read 1988), countries in Asia like China and Japan (Azadi et al. 2010), and countries in Europe and Sub-Saharan Africa (Verzandvoort et al. 2009), to name a few.

Figure 1. Regional Share to Agricultural GVA (2013) and Share to Total Agricultural Land



Source: PSA-NSCB, BAS. Updated from NEDA (2013, 53)

Figure 2. Percent Share of Agriculture to GRDP in 2013



Source of Data: PSA-National Statistical Coordination Board

Table 3. Employment in Agriculture and Poverty Incidence

REGION	Employment ('000 persons)		2012 Poverty Incidence (%)
	2012	2013	
Philippines	12,093	11,835	19.7
NCR	31	29	2.6
CAR	351	348	17.5
I	698	649	14.0
II	844	846	17.0
III	820	846	10.1
IV-A	721	669	8.3
IV-B	626	598	23.6
V	887	866	32.3
VI	1,140	1,107	22.8
VII	874	880	25.7
VIII	788	807	37.4
IX	661	659	33.7
X	846	773	32.8
XI	716	690	25.0
XII	843	837	37.1
CARAGA	386	391	31.9
ARMM	861	840	48.7

Source: PSA-BAS CountrySTAT

pales in comparison despite the relatively large share in agricultural land of these regions (Figure 1). Agriculture however has less importance to Central Luzon and CALABARZON's respective economies compared to Bicol, Zamboanga, and most of the regions (Figure 2).

Another equally important point to consider is that agriculture continues to be the primary source of livelihood of about 11.84 million persons (Table 3) or 31 percent of the total labor force (2013). Most of these workers are consistently among the poorest of the poor, and situated among the most economically deprived regions in the country. The Autonomous Region in Muslim Mindanao (ARMM), for example, has consistently been among the regions with one of the highest poverty incidences (48.7% in 2012). Unsurprisingly, it is also the region with the largest percent share of agriculture industry to its regional economy with 61.28 percent (Figure 2).

2.2. Promoting food self-sufficiency and maintaining local food supply

It is widely held that agricultural lands must be protected to: (1) ensure the ability of a country to produce sufficient food, particularly staple food crops, to meet the requirements of a growing national population; and (2) ensure the continuation of agricultural production in particular geographical regions (Pasour 1982, 740). However, it is also argued that food self-sufficiency is neither necessary nor desirable because a country can rely on imports to meet the national demand for staples, especially if that country does not have the comparative advantage in producing such food crops (DA 2012, 8; Tiongco and Francisco 2011, 2).

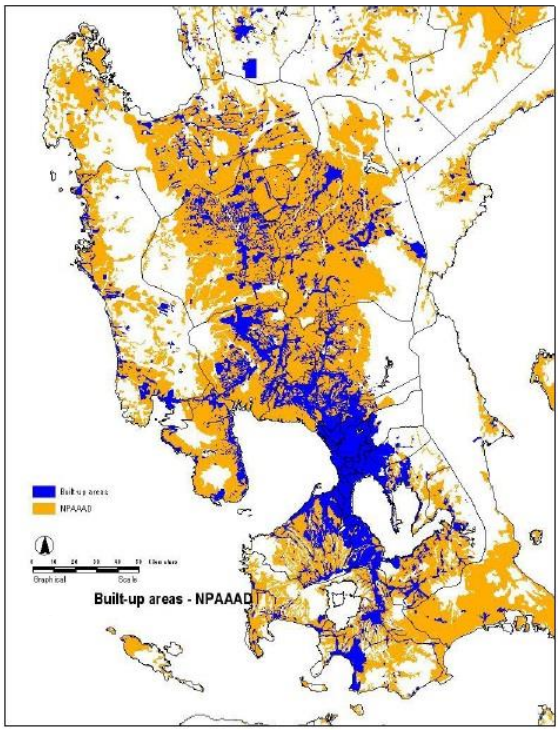
Despite the costs and inefficiencies associated with producing rice as the most important food crop in the Philippines (see Dawe 2012; and Clarete 2012), the government has pursued a rice self-sufficiency policy in consideration of certain realities of world trade (DA 2012, 8). Rice therefore continues to be produced extensively in the agricultural lands of Luzon, the Western Visayas, and Southern and Central Mindanao. Rice production covers more than 4 million hectares or approximately one-third of the country's total land area harvested for crops of 13 million hectares (Piadozo 2012, 1). Central Luzon, in particular, has the biggest area devoted to rice production and accounts for about 19.52 percent of the national irrigated palay output. Its farm productivity or yield per hectare has been consistently above national average. The province of Nueva Ecija contributes nearly half (49%) of the region's palay output (RDC III 2011, 63; PSA-BAS 2014). Table 4 shows the self-sufficiency ratio of rice and other important agricultural commodities.

Table 4. Self-Sufficiency Ratio by Commodity and Year (in percent)

Commodity	2009	2010	2011
Rice	85.83	81.27	93.91
Corn	95.88	98.64	99.06
Coconut	100.01	100.02	100.05
Sugarcane	100	100	100
Coffee	52.5	54.74	54.9
Calamansi	100.02	100.02	100.02
Papaya	101.32	101.9	101.9
Tomato	100	99.54	99.54
Garlic	23.89	35.4	53.65
Onion	97.43	97.9	107.7
Cabbage	100	100	100
Eggplant	100	100	100
Peanut	30.17	30.1	32.94
Mongo	47.55	47.1	57.96
Cassava	100.05	98.89	99.48
Sweet Potato	100	100	100
Potato	98.55	95.21	93.65

Source: PSA-BAS CountrySTAT

Figure 3. Built-up Areas and NPAAAD Map



Source: Corpuz (2013, 40)

2.3. Ensuring orderly urban development

Protecting agricultural land is also deemed necessary to ensure more orderly urban development. One way to increase the efficient use of land is through agricultural zoning (Pasour 1982, 741). Not only would this protect farming operations against piecemeal residential development or spot zoning (Ballesteros 2000, 30), but it would also discourage urban sprawl or the proliferation of low-density housing development, which consumes much more land and simply does not maximize the use and productivity of a very scarce resource (SEPO 2013, 5). Figure 3 shows the encroachment of settlements in prime agricultural lands of Central Luzon and parts of CALABARZON.

A public policy of protecting agricultural lands would force the government and the private sector to develop a higher density housing and urban development strategy in the Philippines. Such strategy is needed to effectively address the current housing deficit and provide better access to employment without compromising national food security and environmental integrity. Overall, protecting agricultural lands is complementary to promoting the necessary pro-urban strategies that recognize the role of a city as a prime generator of wealth and acknowledge the fact that a city can more efficiently function as such through the concentration of people, capital, infrastructure and other resources (Ramos 2000, 6). This would contain urban development patterns from encroaching into protected open spaces.

2.4. Enhancing environmental amenities of open space

Agricultural lands, similar to public parks, forest or nature preserves, historic and cultural landscapes, or any unbuilt-up areas, are open spaces. In an urban development perspective, these open spaces may seem idle, unutilized, or underutilized. There are however beneficial spillover effects or environmental amenities associated with open spaces. Open space, for example, possesses natural system values such as those that provide: (1) water storage, e.g., watersheds or catchment basins; (2) climate moderation, e.g., tropical forests; (3) flood control, e.g., river buffer zones; (4) storm damage prevention, e.g., mangroves areas; and (5) water and air pollution reduction, e.g., urban green belt (Fausold and Lilieholm 1999, 311).

These benefits, however, are generally not well understood and are often undervalued in economic and investment decisions. Thus, it is held that unrestricted land markets will not preserve enough land for open space uses, including agricultural land use (Pasour 1982, 741). The open space value of land must therefore

be separated from its development value (Fausold and Lilieholm 1999, 308). In the Philippines, there is still a need to study the overall or aggregate value of protected open spaces. Building off from valuation studies in other countries, value estimates may be derived by using standard economic analysis techniques (see GreenSpace Alliance 2011, 7; McConnell and Walls 2005).

3. Defining Prime Agricultural Lands: Problems and Implications

Not all agricultural lands warrant protection. The reasons or arguments that agricultural lands should be protected beyond the level dictated by free-market forces are often considered with reference to prime agricultural lands (Pasour 1982, 741; Wood 1976, 910). These lands are generally or agronomically understood to be very fertile and highly suitable for growing the country's major food crops. Prime agricultural lands for reasons of protection, however, cannot be defined and identified solely on the basis of soil or agronomic attributes. This is because physical characteristics alone may also render agricultural lands as prime lands for urban development. Other factors such as environmental, non-physical, and socio-economic elements must also be considered (Wood 1976, 913; Read 1988, 6).

In the Philippines, the most contentious issue in the national land use policy debate may very well be on the definition of prime agricultural lands, mainly because it sets the parameters for agricultural land protection or non-conversion. To the advocates of agriculture and rural development, the current definition will secure the primary source of livelihood of small and landless farmers, farm workers, fisherfolks, and indigenous people, all of whom are consistently among the poorest sectors in the country. On the other hand, for advocates of housing and urban development, the implementing prohibitions on agricultural land use conversion will affect the expansion of urban areas where majority of the population live, and where most jobs are generated. If not defined properly, the provisions on prime agricultural lands may render the NaLUA as anti-urban or anti-metropolitan, that is, nothing will be left for residential, commercial, institutional and other non-agricultural development.

This section will analyze the problems or implications in coming up with an appropriate and practical definition of prime agricultural lands. Specifically, it will discuss the concept of prime agricultural lands in the context of: (1) the definition and identification of the Network of Protected Areas for Agricultural and Agro-Industrial Development (NPAAAD), which served as the basis for defining the proposed NaLUA's prime agricultural lands; (2) the concept and criteria of the Strategic Agricultural and Fisheries Development Zones, which was not considered in drafting the NaLUA bill; (3) the prioritization and coverage of irrigated and irrigable lands, which is the most favored and recognizable type of protected agricultural lands; and (4) the protection and inclusion of agrarian reform lands in NaLUA's priority areas for agricultural development.

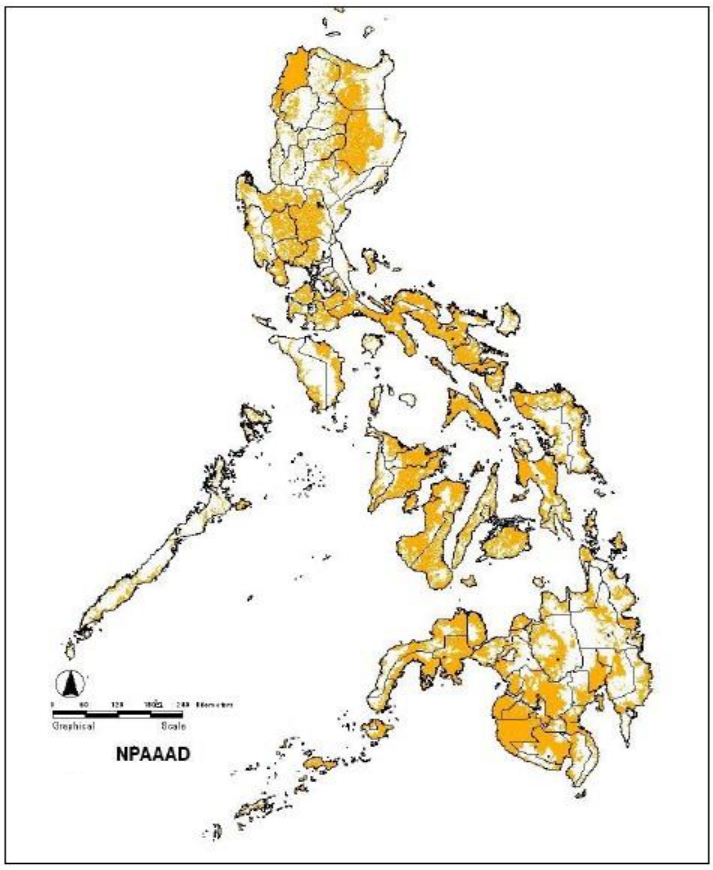
3.1. Network of Protected Areas for Agricultural and Agro-Industrial Development

Republic Act (RA) 8435 or the Agriculture and Fisheries Modernization Act (AFMA) of 1997 mandated the identification of areas for agricultural and agro-industrial development. Collectively referred to as the NPAAAD, these areas were envisioned to promote efficient utilization of land for agriculture and agro-industrial development and promote sustainable agricultural growth. More specifically, the NPAAAD covers: (1) all irrigated areas and all irrigable lands; (2) all alluvial flood plain lands; (3) agro-industrial croplands; (4) highland or areas located at an elevation of 500 meters or above and have the potential for growing semi-temperate and high value crops; (5) all ecologically fragile agricultural lands; and (6) mangrove areas and fish sanctuaries (see AFMA Section 4 or AFMA IRR Rule 6.1 for detailed enumeration).

To bridge the land use policy gaps (SEPO 2013, 8), particularly on food security and rice self-sufficiency, the proposed NaLUA intends to expand agricultural land protection by prohibiting the conversion and reclassification of, not just irrigated

and irrigable agricultural lands but, all prime agricultural lands. However, without an existing legal definition of prime agricultural lands, the proposed NaLUA unsystematically defined these as those lands basically covered under the NPAAAD.[3] A closer analysis of using AFMA's NPAAAD as basis for the definition of NaLUA's prime agricultural lands would present some inherent and interrelated problems or implications.

Figure 4. NPAAAD Map



Source: Corpuz (2013, 55)

First, is on term usage. While the term "prime agricultural lands" is commonly used in scientific or academic papers, there is actually no clear, legal definition of prime agricultural lands in the Philippines. It was never defined in the AFMA, CARL, and CARPER Law.[4] Presidential Administrative Order (AO) 363-97[5] vaguely defined it as "lands that can be used for various or specific agricultural activities and can provide optimum and sustainable yield with a minimum of inputs and development cost as determined by the Department of Agriculture (DA)". On the other hand, DA AO 025-12[6] only refers to related terms such as: (1) *areas non-negotiable for conversion*, which are basically irrigated and irrigable lands; and (2) *areas highly restricted from conversion*, which are basically areas under NPAAAD. With the ongoing onerous policy debate on land use, it is clear that a legal definition of the term "prime agricultural lands" that warrants absolute prohibition from conversion and reclassification has yet to be established.

Second, is on scope or coverage. One of the major constraints that has been identified in implementing AFMA is the very broad definition, and hence scope, of NPAAAD itself. David (2008, 120) has pointed out that most areas of the country can actually be included in the definition of NPAAAD because the necessary criteria needed to properly identify and delineate such areas are either lacking or loosely defined. Efforts to develop and use these criteria or guidelines resulted in a delineated NPAAAD that basically covered the whole country (consider Figure 4). Even with a proper delineation process, it is clear that the concept of NPAAAD or prime agricultural lands should only refer to selected agricultural lands, and should not entirely cover all agricultural lands.

Third, is on the prohibitions on agricultural land use conversion. By adopting the definition of AFMA's NPAAAD, the proposed NaLUA essentially imposes these prohibitions to all NPAAAD areas, which technically are areas that are still negotiable for conversion. It should be noted that even if a large portion of agricultural lands was properly

[3] There are, of course, some variations: SB 63 included, for example, all lands classified by the Bureau of Soils and Water Management (BSWM) under its land capability classification system as Class A, Class B, and Class C lands. HB 4382 refers to contiguous irrigated areas, and alluvial plains that have been identified to satisfy the country's needs for food self-sufficiency and security.

[4] RA 6657 or the Comprehensive Agrarian Reform Law (CARL) of 1988, and RA 9700 or the Comprehensive Agrarian Reform Program Extension with Reform (CARPER) Law of 2009.

[5] PAO 363 Series of 1997: Prescribing Guidelines for the Protection of Areas Non-Negotiable for Conversion and Monitoring in Compliance with Section 20 of the Local Government Code.

[6] DA AO 025 Series of 2012: Guidelines for the Issuance by the DA of Certificate of Eligibility/Non-Eligibility for the Reclassification of Agricultural Lands.

Table 5. Summary of SAFDZ

Zone Category/ Mapping Symbol	Area (in hectares)	(%)
SAFDZ area		
1 Crop	8,679,774	27.1
2 Livestock	870,857	2.7
3 Fisheries	570,733	1.8
4 Crop/Livestock	430,315	1.3
5 Crop/Fisheries	41,473	0.1
6 Crop/Livestock	29,486	0.1
7 Fisheries/Livestock	15,459	0
Subtotal	**10,638,096**	**33.2**
(%)	33.16	
8 Remaining NPAAAD	2,818,228	8.8
(%)	8.78	
Non-SAFDZ areas		
9 Agro-forestry	2,895,008	9
10 Watershed/Forestry	14,329,281	44.7
11 Built-up areas	1,185,011	3.7
Riverwash/Lahar	105,990	0.3
Economic Zones	6,801	0.2
Military Reservation	97,539	0.3
SD Sand Dunes/beach area	6,258	0.01
Subtotal	**18,625,888**	**58.1**
(%)	58.06	
Grand Total	**32,082,212**	**100**

Source: DA, October 2002, based on the recommended areas by about 91% of all local government units; In David 2008, 112

identified and delineated as NPAAAD areas, AFMA never intended to prohibit the conversion and reclassification of all these areas. The AFMA and related executive issuances (e.g., DA AO 025-12) actually have provisions or guidelines on the conversion of agricultural lands within the NPAAAD, hence the term "areas highly restricted from conversion", as opposed to "areas non-negotiable for conversion".

Lastly, and more importantly, by defining prime agricultural lands as those covered under NPAAAD, the proposed NaLUA inadvertently disregards a very important concept and a central component of AFMA—the Strategic Agricultural and Fisheries Development Zones (SAFDZs).

3.2. Strategic Agricultural and Fisheries Development Zones

Within the NPAAAD, the AFMA mandated the identification and delineation of the SAFDZs, mainly to focus the resources of government into areas where these can have the greatest economic impact in terms of enhanced agricultural productivity and poverty reduction. With the SAFDZ, the AFMA in effect: (1) directs the market for agricultural development to concentrate in particular pre-identified areas; and (2) redirects the market for urban development away from these areas.

Unlike the all-encompassing definition of the NPAAAD, the SAFDZ is the more appropriate and practical concept area that may be considered as prime agricultural lands because it is more specific, and because it considers other environmental, non-physical, and economic factors. These factors are reflected in its mandated criteria on: (1) agro-climatic and environmental conditions; (2) strategic location of the area for agricultural infrastructure, industrial complexes, and market development, among others; and (3) dominant presence of agrarian reform communities (see AFMA Section 6).

Like the SAFDZ criteria, the concept of prime agricultural lands recognizes that agricultural land is considered prime relative to: (1) some defined population; (2) different sets of commodities; and (3) a given spatial context (Wood 1976, 910-911; Read 1988, 6). Prime agricultural lands, for example, from the perspective of Nueva Ecija, which is the country's rice granary, may be considerably different from the perspective of Zamboanga Sibugay, which ranks first in the production of rubber. From the standpoint of the national government in achieving rice self-sufficiency, most if not all farms in Nueva Ecija, and similar productive rice-producing provinces, may already be considered as prime agricultural lands. In contrast, having a rubber industry as an important part of its local and neighboring economies,

Table 6. Irrigated and Irrigable Lands by Region (in hectares)

REGION	Estimated Total Irrigable Area	Total Irrigated Area	
		as of 2012	as of 2013
Philippines	3,126,340	1,626,510	1,678,595
CAR	99,650	86,431	88,783
I	277,180	168,822	168,592
II	472,640	267,980	272,611
III	498,860	281,757	290,450
IV	246,960	115,737	116,448
V	239,660	124,127	130,093
VI	197,250	108,909	112,397
VII	50,740	38,914	40,991
VIII	84,380	64,062	67,397
IX	76,080	39,099	43,801
X	120,700	59,835	60,869
XI	149,610	62,228	63,119
XII	293,610	107,286	112,112
CARAGA	162,300	60,920	65,626
ARMM	156,720	40,402	45,306

Source: PSA-BAS CountrySTAT

Table 7. Palay and Corn: Area Harvested by Region: 2013 (in hectares)

REGION	Irrigated Palay	Palay	Corn
Philippines	3,236,336	4,746,082	2,563,635
CAR	94,352	119,919	61,639
I	279,749	406,813	84,106
II	510,337	585,285	416,740
III	631,664	710,817	44,151
IV-A	81,415	115,518	33,906
IV-B	188,471	282,956	28,022
V	222,226	343,199	109,582
VI	288,187	616,273	123,946
VII	60,505	106,191	197,941
VIII	129,310	282,153	61,722
IX	94,776	161,721	125,949
X	138,670	158,338	372,565
XI	88,939	103,294	159,378
XII	270,123	350,346	430,007
CARAGA	99,786	176,559	38,017
ARMM	57,826	226,700	275,964

Source: PSA-BAS CountrySTAT

Zamboanga Sibugay may comprehensively include its 71,180 hectares of rubber plantation in what it would designate as prime agricultural lands.

The experience of implementing AFMA in terms of identifying the SAFDZs (David 2008, 104-115) would thus provide notable lessons (i.e., need for adequate and accurate information, and the selection of strategic location) in redefining and identifying prime agricultural lands under the proposed NaLUA. It has been pointed out, for example, that the total SAFDZ area of 10.64 million hectares delineated mainly by local government units is "too big for all intents and purposes".

3.3. Irrigated and Irrigable Agricultural Lands

Within the SAFDZs, the AFMA provided for the "full" protection or non-conversion of specific agricultural lands. These lands only include: (1) irrigated or irrigable agricultural lands,[7] primarily because these represent areas planted to traditional, staple food crops (Table 6 and 7); and (2) lands with existing or having the potential for growing high-value crops (Tables 8 and 9), primarily because of the huge profits such crops earn in the export market.

In policy debates however, prime agricultural lands were mostly associated with irrigated or irrigable lands because of the apparent need to protect huge investments in the most expensive agricultural intervention—irrigation—to produce the country's most important staple—rice. Because of its very nature, irrigated and irrigable lands would also be the most recognizable type of prime agricultural lands, that is, they are contiguous areas serviced by natural irrigation or irrigation systems managed by agencies like the National Irrigation Administration (NIA).

Data of the NIA from 1990 to 2012 shows that around 3.13 million hectares of agricultural lands (primarily devoted to rice and corn) are considered irrigable.[8] However, it has been pointed out that these estimated potential irrigable areas are rough NIA approximations. They consist of all contiguous areas of 100 hectares or more with slopes not exceeding 3.0 percent (see David 1990, 17). A study by the World Bank, in contrast, identified more than 6.1 million hectares of agricultural land as irrigable, including areas that are relatively more difficult to irrigate and up to 8.0 percent slope. As of December 2013, about 1.68 million hectares or 53.69 percent of the 3.13 million hectares have been developed for irrigation (Table 6).

[7] Specifically referring to all irrigated lands, and irrigable lands already covered by irrigation projects with firm funding commitments.
[8] The 2013 estimates are 3.02 million hectares, deducting converted areas and permanently non-restorable areas.

Table 8. Other Crops: Area Harvested by Region: 2013 (in hectares)

REGION	Coconut	Sugarcane	Banana
Philippines	3,550,491	437,068	445,935
CAR	332	339	5,149
I	12,182	451	7,615
II	14,236	12,203	25,422
III	24,037	18,976	6,228
IV-A	440,640	29,607	29,879
IV-B	199,966	..	22,245
V	452,967	5,533	18,824
VI	127,245	221,230	34,964
VII	128,666	44,988	21,616
VIII	419,640	6,512	30,543
IX	380,919	90	20,142
X	302,433	70,871	51,857
XI	348,483	9,607	83,628
XII	184,961	15,128	32,075
CARAGA	191,107	3	23,020
ARMM	322,677	1,531	32,728

Source: PSA-BAS CountrySTAT

Table 9. Other Crops: Area Harvested by Region: 2013 (in hectares)

REGION	Mango	Pineapple	Peanut
Philippines	187,838	60,750	25,600
CAR	779	111	250
I	22,118	26	7,421
II	10,308	1,242	3,506
III	34,360	157	1,283
IV-A	14,185	3,840	543
IV-B	3,829	75	1,155
V	2,851	3,083	1,276
VI	9,869	845	3,377
VII	12,586	474	1,349
VIII	910	584	807
IX	16,862	327	718
X	8,722	23,108	1,843
XI	17,439	1,978	515
XII	17,423	24,580	536
CARAGA	2,633	230	119
ARMM	12,965	91	903

Source: PSA-BAS CountrySTAT

Though the apparent need to protect irrigated lands is highly recognized, the notion that all irrigable lands are also prime remains to be highly controversial. Under AFMA, irrigable lands outside the SAFDZs, technically, may be converted upon compliance to existing land use conversion laws.[9] In the proposed NaLUA, all irrigable lands are considered as prime agricultural lands and therefore protected from agricultural land use conversion. At first glance, it would seem that these represent the low estimate of 3.13 million hectares or the high estimate of 6.1 million hectares, minus the total irrigated land of 1.68 million hectares. There were concerns that the estimates may be higher if more advanced irrigation technologies are made available and become more affordable. Others have even argued that, from an irrigation engineering perspective, all agricultural lands are irrigable because even deserts can be turned into productive farmlands with the application of modern irrigation technologies.

However, irrigable lands in the proposed NaLUA only refer to those already covered by irrigation projects with firm funding commitments and thus would only comprise a relatively small land area, i.e., 1.68 million hectares plus the annual increment on irrigated land. Still, given the slow pace of irrigation development, such definitional criteria would practically leave to the market the decision of which irrigable lands are available for conversion. Given the land market failures in the Philippines (Ballesteros 2002, 2-3), a public policy of protecting prime agricultural lands, properly pre-identified beyond the medium term, will support the basic government function of redistributing wealth especially to the most marginalized sectors of the country.

3.4. Agrarian Reform Lands

Like in irrigated and irrigable lands, government has invested much in agrarian reform lands, specifically through land acquisition and distribution under the Comprehensive Agrarian Reform Program (CARP). Currently, around 90 percent of the balance for land acquisition and distribution consists of private agricultural lands, 42 percent of which are large private agricultural lands of more than 24 hectares. As of January 1, 2013, the remaining land to be acquired and distributed by the Department of Agrarian Reform (DAR) is at 879,526 hectares.

Under the proposed NaLUA, all lands subject to CARP including those lands covered under the notice of compulsory acquisition/voluntary offer to sell are protected from conversion

[9] Section 9 of AFMA pointed out that specific types of agricultural lands that are "delineated and included within the SAFDZ" shall be protected from conversion. In addition, Rule 9.6 of the AFMA Implementing Rules and Regulations (IRR) states that agricultural lands outside the SAFDZs may be converted. This view is reinforced in DA AO 025-12, which identifies particular irrigable lands as areas highly restricted from conversion.

Table 10. Land Distribution Accomplishment by Region: 1972 - June 2012

REGION	Scope (in hectares)	Total Net Area Distributed (in hectares)	No. of Agrarian Reform Beneficiaries
Philippines	5,373,060	4,415,404	2,574,792
CAR	106,908	99,539	78,404
I	143,692	141,555	117,298
II	415,733	351,786	202,734
III	436,719	413,408	267,820
IV-A	213,563	174,537	112,532
IV-B	193,460	173,927	124,255
V	447,039	308,683	184,854
VI	557,943	382,076	268,854
VII	202,259	175,828	138,440
VIII	501,964	428,942	192,720
IX	248,197	221,130	126,025
X	364,357	302,643	173,156
XI	269,519	239,056	170,919
XII	670,602	553,009	232,003
CARAGA	279,775	239,234	118,703
ARMM	321,330	210,051	66,075

Source: DAR in http://enrsis.denr.gov.ph/
Notes: This is preliminary and subject to validation. DAR's revised scope is derived by adding the validated balance of 961,974 hectares as of December 2011 and DAR's LAD accomplishment as of end of December 2011 of 4,441,086 hectares.

pending the distribution and installation of the farmer beneficiaries. Subsequently, the proposed NaLUA refers to the conditions of the CARPER Law that allows land use conversion after the lapse of five years from its award when: (1) land ceases to be economically feasible for agriculture; or (2) the locality has become urbanized and the land will have a greater economic value for other purposes. It was emphasized however that these conditions on conversion are not applicable to prime agricultural lands. Nonetheless, the protection of agrarian reform lands, though temporary, may be all-encompassing. This is because, under the CARPER Law, all public and private agricultural lands, except for those five hectares and below, are subject to CARP.

By its very nature, agrarian reform lands are prime relative to agrarian reform beneficiaries. It may be the more productive farmers in Nueva Ecija or the poor agricultural workers in ARMM. Given the huge public expenditure in land acquisition and distribution, a huge portion of agrarian reform lands, especially the more productive and large private agricultural lands, may very well be considered as prime agricultural lands. With this view, there would be a "shift from private ownership to social or political control of land use" (Pasour 1982, 739). With such a concept, farmer beneficiaries, for example, who no longer want to farm should not have the privilege of selling or converting these prime agricultural lands, i.e., they can own or lease the land but it should not be subjected to conversion.

4. Policy Decision and Criteria Considerations

With the ongoing onerous policy debate on enacting a national land use policy, it is clear that a socially acceptable definition of the term "prime agricultural lands" that warrants absolute prohibition from conversion and reclassification has yet to be established. The basic problem is that actors and institutions in the policy process fail to recognize that the concept of protecting prime agricultural lands is a policy decision of pre-identifying and maintaining a socially acceptable minimum agricultural land requirement, that is, the necessary agricultural land to maintain some form of agricultural industry in the country, at a given point in time. Policy actors and institutions must be able and willing to separate the scientific classification function and the policy-decision function of defining and identifying prime agricultural lands for purposes of protection (Wood 1976, 909).

Since implementing prohibitions on agricultural land use conversion will affect the expansion of urban areas where majority of the population live, and where most jobs are generated, a stringent set of criteria on identifying prime agricultural lands must be developed. This set of technical criteria

may comprise or include factors that are generally similar to the SAFDZ criteria. However, for the proper identification of prime agricultural lands, Read (1988, 7-10) has pointed out the consideration of not only the agronomic, environmental, and non-physical factors, but more importantly, the socioeconomic factors.

4.1. Agronomic factors

The agronomic factors in the evaluation process would comprise of soil characteristics and agricultural production management attributes that are significant determinants of agricultural growth. The 1976 Framework for Land Evaluation by the Food and Agriculture Organization (FAO) of the United Nations provides a detailed list of agronomic factors. The DA-BSWM, in particular, may easily provide the necessary agronomic data in the identification of prime agricultural lands.

In Amongo et al. (2011, 3), the different soil characteristics in the regions of the Philippines have been summarized as follows: (1) well-drained, high fertility soil: Region IVA-B; (2) well-drained, generally acidic, high fertility volcanic soils: parts of Region IVA-B; (3) well-drained, deep, low fertility soils: most of Regions CAR, I-V, VIII-ARMM; (4) poorly-drained, flood prone soils: parts of Regions II-IVB, VI, X-XII; (5) poorly-drained, high to moderate fertility soils: parts of Regions III, V, VI, XI, XII; (6) heavy textured soil with shrink-swell potential: parts of Regions I-IVB, VI, XI, XII; (7) droughty, low fertility sandy soils: parts of Regions III and VI.

4.2. Environmental factors

Agronomic factors are significant at a scale that affects individual farm land-use decisions. While closely related, environmental factors have managerial significance at a larger scale. Some of the environmental factors are: (1) climate; (2) water quality; (3) land degradation hazard; (4) flood hazard; (5) susceptibility to drought; and (6) air quality.

Climate scenarios, for example, projected by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) for 2020 and 2050 indicate rising mean annual temperatures causing drier dry seasons and wetter wets seasons in the future. The PAGASA estimates that the Visayas and Mindanao islands, e.g., Camarines Norte, Albay, Cebu, and Western Mindanao will be most affected. Such scenarios are important because crop performance in general is very low during the wet season, while prolonged dry months would also be a problem in some areas because these restrict cropping only during the wet months.

4.3. Non-physical factors

Among the determining factors of agricultural growth and sustainability are those that are associated with market, industry, or community requirements. The more significant of these non-physical factors are listed as follows: (1) continuity of food supply, particularly those that are very perishable; (2) size and location of markets; (3) area of production required to maintain the viability of existing or proposed process industries; (4) area serviced by major public utilities that are specific to the industry, e.g., irrigation facilities; (5) size of existing landholdings and the potential to subdivide; and (6) significance of agriculture to the concept of open space.

4.4. Socioeconomic factors

Raup (1976 In Read 1988, 9) has pointed out that the concept of prime agricultural land rests in the final analysis on economic criteria, not on physical characteristics of the land. “While economic (or socioeconomic) factors are more complex to encompass within a useful definition, they are probably of overriding importance and cannot be ignored.” Considering socioeconomic factors in the identification of prime agricultural lands for protection is another reason why the overall land use and physical planning function of implementing the proposed NaLUA is properly lodged under the National Economic and Development Authority (NEDA) Board (SEPO 2013, 11). The more significant socioeconomic factors that may be considered by the NEDA Board are: (1) opportunity cost evaluation; (2) substitution of

resources; (3) flexibility of use; and (4) externalities.

Opportunity cost evaluation. Opportunity cost is usually defined as the benefit foregone from using a good or resource in its best alternative use or simply the cost of the foregone alternative. For example, the opportunity costs of protecting prime agricultural lands to society would include higher cost of private housing subdivisions partly due to higher site-preparation construction costs associated with building on steeply sloping, poorly drained, or possibly heavily wooded sites (Hite and Dillman 1981, 48). In the same respect, the opportunity cost of agricultural land use conversion would include the loss of rural on-farm employment and food production capacity, among others. Imagine, for example, the opportunity cost, or social and economic impact of converting 34,395 hectares of prime agricultural land to accommodate a total housing need of 5.7 million, if these were designed as detached private housing units (SEPO 2013, 5), as opposed to publicly providing higher-density residential buildings which requires far more less land.

Substitution of resources. Agricultural crops that have a narrow range of land requirements will be dependent upon limited areas of production. Coconut palm for example is grown on a wide range of soil types. It thrives on sandy soils and highly tolerant of salinity. It prefers areas with abundant sunlight and regular rainfall. Land suitable for coconut production is not limiting and the loss of relatively small areas by urban expansion is unlikely to seriously affect the coconut industry in the foreseeable future. In contrast, wetland rice only grows well in clayey and less permeable soil with a slope of less than one percent to maintain a flooded condition in the paddy. Velasco and Cabanilla (2003, 17) has indicated that only about 2.33 million hectares can be classified as highly and moderately suitable for wetland rice production. The biggest contiguous depositional areas identified for wetland rice are in: (1) Regions I, II and III in Luzon with a combined land area of 1.5 million hectares (44% classified as highly and moderately suitable); and (2) Regions X, XI and XII in Mindanao with a combined land area of 0.98 million hectares (65% classified as highly and moderately suitable).

Flexibility of use. Land that is suitable to a wide range of agricultural uses is of value to a wide range of economic levels, i.e., farm, local and national level. When prices are depressed for one commodity, another may be produced. The United States Department of Agriculture (USDA) has a land capability classification system wherein lands are classified in terms of its potential for use in specified ways and with specified management practices. Class I is treated as the "best" land, being suited to most types of use, while successively higher-numbered classes have more limitations and less flexibility of use. The DA-BSWM also has a similar classification system.

Externalities. The benefits and costs to society that cannot be measured adequately by monetary values should still be considered for agricultural land protection. These include: (1) environmental quality; (2) public open space; (3) national heritage value of rural landscapes, e.g., Banaue rice terraces; (4) the capacity for choice of land use in the future; and (5) security to society in the visible existence of the resources that are most capable of producing food and fibre.

5. Conclusion

Free-market forces may make economic sense for the use of capital but do not provide community requirements for open space, nor prevent land degradation by the transfer of land use priorities to less suitable areas. When compared economically with major land developments, agriculture is almost always the least favored option. Where land has value for purposes other than the immediate investment value, then protection is required (Read 1988, 5).

Many would advocate that the free market provides the most efficient way of allocating valuable land resources. Market failure however exists. The land market, influenced as it is by related public policies, may not be capable of producing socially acceptable outcomes in allocating land between agricultural and non-agricultural uses. This is clearly demonstrated by the recurring land use issues and conflicts in the Philippines, like in any other relatively unrestricted economies.

While AFMA and the CARPER Law provided the non-conversion of irrigated and irrigable lands already covered by irrigation projects with firm funding commitments, a national land use policy should be enacted to specifically provide for the full protection of ALL prime agricultural lands from conversion.

The term “prime agricultural lands” however has to be properly defined. Prime agricultural lands for purposes of protection should represent a socially acceptable minimum agricultural land requirement that would maintain a certain level of agricultural industry in a given economic or spatial context at a given point in time. This definition should point out that not all agricultural lands are strategic; not all are prime; not all warrant protection. In the same respect, this should also point out that not all rural localities will become urbanized; not all municipalities will become cities; and not all agricultural lands even within a city’s jurisdiction can be converted.

The concept of prime agricultural lands for protection, however, should be precise. The policy decision of defining and pre-identifying such lands is both sector-specific and location-specific and therefore should be addressed by the national government, particularly through the NEDA Board, and local government units through an iterative process of a combined bottom-up and top-down approach in planning. This proposed public policy, with the accompanying long-term physical and land-use planning for its successful implementation, basically challenges the allocative efficiency usually associated with free-market forces.

Since implementing prohibitions on agricultural land use conversion will affect the expansion of urban areas where majority of the population live, and where most jobs are generated, a stringent set of technical criteria on identifying prime agricultural lands must be developed. These criteria may consider the following: (1) agronomic factors, e.g., soil characteristics; (2) environmental factors, e.g., climate, water quality and availability, land degradation hazard, drought susceptibility; (3) non-physical factors, e.g., market or industry

requirements; and (4) socioeconomic factors, e.g., opportunity cost evaluation.

The conversion and reclassification of all prime agricultural lands should be prohibited to: (1) protect agriculture as a very important local industry, and enhance the potential of agriculture and agriculture-based industries to generate more jobs and further reduce poverty; (2) promote national food self-sufficiency and maintain local food supplies; (3) ensure orderly urban development; and (4) enhance environmental amenities associated with open space.

Pending the enactment of a national land use policy that will rationalize the optimal allocation of land among competing uses, both the national and local governments need to protect the country's highest quality agricultural lands and ensure that investments in irrigation, land acquisition and distribution, among others, are not wasted, and that rural on-farm as well as off-farm employment of the marginalized are not compromised because of unwarranted land conversion.

Though agricultural land use conversion is a threat to agriculture, it is still a logical result of population growth and economic development and eventually an unavoidable consequence in the urban development process. Thus, to truly protect irreplaceable prime agricultural lands from conversion, a national land use policy should also be able to promote an urban concentration strategy as the primary means to address issues on urban expansion, efficiency, and capacity. This will be discussed in the next iteration of a national land use policy brief.

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