Journal of Food Law & Policy

Volume 18 | Number 1 Article 7

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Recommended Citation

Rivera-Aquino, J. A. (2022). Plantain Cultivation in Puerto Rico: Its Inclusion in the National Crop Table of the United States Department of Agriculture's Farm Service Agency, and its Loss Compensation in Disaster Programs. *Journal of Food Law & Policy, 18*(1). Retrieved from https://scholarworks.uark.edu/jflp/vol18/iss1/7

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Journal of FOOD & LAW POLICY

Volume Eighteen Number One

Spring 2022

PLANTAIN CULTIVATION IN PUERTO RICO: ITS INCLUSION IN THE NATIONAL CROP TABLE OF THE UNITED STATES DEPARTMENT OF AGRICULTURE'S FARM SERVICE AGENCY, AND ITS LOSS COMPENSATION IN DISASTER PROGRAMS

Javier A. Rivera-Aquino

A PUBLICATION OF THE UNIVERSITY OF ARKANSAS SCHOOL OF LAW

Plantain Cultivation in Puerto Rico: Its Inclusion in the National Crop Table of the United States Department of Agriculture's Farm Service Agency, and its Loss Compensation in Disaster Programs.

Javier A. Rivera-Aquino, Esq.[*]
April 11th, 2022[**]

Abstract

If justice is to provide each person what they deserve, it seems plantain producers in Puerto Rico did not relish a just compensation for their farm losses after Hurricane Maria in 2017. The main culprit? Stale data. Farm Service Agency's (FSA) Wildfire and Hurricanes Indemnity Program (WHIP) utilized plantain production data under the National Crop Table (NCT) 2017, which seemingly did not reflect up-to-date yield averages of Puerto Rico's plantain farmers at the time of Hurricane Maria. According to the University of Puerto Rico (UPR), one acre of plantains, in the highlands, where no irrigation is utilized, averages a yield of 30,000 fruits. Based on NCT data, the County Expected Yield (CEY) for non-irrigated plantains in 2017, is 19,142 fruits per acre. UPR's averaged yields of 42,075 fruits for the coastal, semi-arid plains of Puerto Rico, where irrigation is more often used, whereas the NCT data, reflects an equivalency of 25,714 fruits. Plantain CEYs have been the same since 2013, for all counties in Puerto Rico, disregarding improvements in higher yielding clonal varieties and plant health protection, as well as plant density. Because the NCT data is used to determine loss compensation under Standing Disaster Assistance Programs like the Noninsured Crop Assistance Program (NAP), and *Ad Hoc* Payments such as WHIP, as less plantain fruits per acre were accounted for in FSA's dataset, plantain farmers received inadequate compensation. To claim higher compensation, plantain farmers will have to prove in administrative appeal, by

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[**] A first draft version was written on February 22nd, 2021; it was written in Spanish, more focused on the economic impact, without entering legal and policy considerations. An English version was written on October 17, 2021.

preponderance of the evidence, that the agency erred applying its own rules. They will have to overcome jurisdictional matters as well as the appealability of rules of general applicability. Funding considerations also apply. The data contained on the NCT will have major impact on FSA decisions in the future. A less than adequate compensation for plantain losses is likely to occur again if the data is not accurately maintained. Puerto Rico is situated in a hurricane alley, and plantains are very susceptible to wind damage. It is in the best interest of plantains farmers to verify that the information contained in the NCT is current and accurate, to avoid less than adequate compensations in the future. The objective of this paper is to raise awareness so that farmers can be better prepared and more involved in FSA decision making, and know their legal options, to ensure better program delivery.

I. Introduction

On September 20th, 2017, Hurricane María struck Puerto Rico as a Category 4 hurricane, borderline Category 5. With sustained winds of over 155 mph and gusts of wind exceeding 180 mph, this event had catastrophic results throughout Puerto Rico, particularly on its agriculture. This was one of many natural disasters experienced in the United States (U.S.) during that year.

It is known that farms are quite susceptible to natural disasters, not only affecting the livelihoods of farmers, but compromising food security as well, and because of it, the Federal Government provided funding to assist farmers overcome the losses inflicted by these natural disasters in the form of crop-loss compensation and recover as soon as possible. These compensations are often based on historical production and sales data provided by farmers to government institutions, or by regional production and sales historic averages kept by these institutions. If data is accurate and up-to-date, compensations will fairly reflect the losses experienced by farmers. Instead, if production and sales data is not properly kept, overpayments or underpayments are likely to occur. When the first occurs, taxpayers' money is expended unjustifiably. If the latter occurs, the purpose of disaster relief programs is defeated as farmers will not fully recover from their losses.

In this article, the second scenario is analyzed from the perspective of a staple crop, plantains, grown mostly by historically underserved farmers in the unincorporated U.S. territory of Puerto Rico. There is data that supports that, production and sales averages kept by the Federal government did not reflect up-to-date averages. This article looks in depth the effect FSA's official data had on the disaster loss compensations to plantain producers, explores the legal

remedies available to these farmers, and proposes a call to action to ensure proper policy execution.

II. Plantain Cultivation in P.R.

It can be argued that, within the U.S., commercially grown plantain mostly occurs in Puerto Rico,[1] as it is a tropical cultivar, widely used in many Puerto Rican dishes. Plantain cultivation was the most important crop in Puerto Rico.[2] According to the 2017 Agricultural Census,[3] there were 2,035 farms dedicated to plantain cultivation, with 10,315 acres (10,624 "cuerdas")[4] in production, with an estimated value of $42,271,955.[5] This figure reflects a significant decrease if compared to the 2012 data: 4,737 plantain farms; 22,060 acres (22,719 "cuerdas"); at a value of $80,505,103.[6] This reduction in production is mainly due to the passage of Hurricane María in 2017.

Plantain (musa spp.) cultivation can be produced throughout all of Puerto Rico. Traditionally its cultivation is divided into two zones: Highlands or Humid areas; and Semiarid, also referred to as Coastal.[7] This crop can be cultivated with irrigation (usually in semiarid or coastal areas) or without irrigation (usually in the highlands, where rainfall is evenly distributed throughout the year). One plant bears a "bunch" or "raceme" with several fruiting "hands."[8]

In Puerto Rico, the following plantain varieties are found: a), Maricongo, which can produce between 32 and 45 fruits per bunch; b) Dwarf (or Common Dwarf) which can average 25 to 40 fruits; (c) Hartón, with an average of 15 to 25 fruits; d) Super Plátano, which

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[1] A quick search of this crop on USDA's National Agricultural Statistics Service only showed results for this cultivar in Puerto Rico.

[2] *See* Mildred Cortés & Manuel Díaz, *Gastos e ingresos proyectados para la producción de una cuerda de plátanos con una densidad de 1,100 plantas en la zona semiárida de Puerto Rico* 2017-2018 [*Projected Expenses and Income for the Production of a 'Cuerda' of plantains with a Density of 1,100 Plants in the Semi-Arid Zone of Puerto Rico* 2017-2018] (n.d.), available at https://www.mercadeoagricolapr.com/wp-content/uploads/2019/11/platano-llano-.pdf.

[3] Prepared by the USDA National Agricultural Statistics Service (NASS), issued in 2020.

[4] One (1) "cuerda" equals 0.971 acres.

[5] NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., AC-17-A-52, 2017 *Census of Agriculture: Puerto Rico (2018): Island and Regional Data 48 (2020)*.

[6] *Id.* at 19 tbl. 15.

[7] *Cortés & Díaz*, *supra* note 4.

[8] OECD (2010), *Safety Assessment of Transgenic Organisms: OECD Consensus Documents*: Volume 4, OECD Publishing.

by pruning inferior fruits, can average 58 to 60 fruits per raceme. [9] Over the past ten (10) years, high-yielding varieties have been selected and cloned, producing a greater number of fruits per plant.[10] According to the University of Puerto Rico (UPR), planting densities can range from 850 Plantain plants per "cuerda" (825 plants per acre) in the Highlands to 1,100 plants per "cuerda" (1,068 plants per acre) in the Coastal plains, and sales should be $9,000.50 with a net income per "cuerda" approximates $5,114.68, and $12,622.50 and a net income should be $8,867.31 respectively.[11]

Plantain is a versatile product; it can be consumed green or ripe, and it is suitable for either fresh consumption, or for processing. The Puerto Rico Department of Agriculture (PRDA) estimates the *per capita* consumption of plantains in Puerto Rico at 50.47 pounds.[12] A phytosanitary ban[13] limits the entry of fresh produce with skin into Puerto Rico, to prevent the entry of pests.[14] The market for processed plantains seems to have taken surge, most products being imported (presumably from South and or Central America), except for plantain chips.[15] Vertical integration (farming-manufacturing or farming-distribution) is limited. Roadside vendors, supermarkets, and restaurants, as well as farmers markets and school cafeterias, are

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[9] Manuel Diaz Rivera, *Manual práctico para el Cultivo Sustentable de Plátanos* [*Practice Manual for the Sustainable Cultivation of Plantains*] 8-9 (1997).

[10] *See* Departamento de Agricultra de Puerto Rico [Department of Agriculture of Puerto Rico], *Orden Administrativa 2010-05* [*Administrative Order 2010-05*]. *See also* Gerardo E. Alvarado León, *Aceleran con technologia el cultivo de plátanos* [*Technology Accelerates Cultivation of Plantains*], PRESS READER (Feb. 2, 2019), https://www.pressreader.com/puerto-rico/el-nuevo-dia/20190202/281492162554032.

[11] Mildred Cortés & Manuel Díaz, *U.P.R., Presupuesto Modelo: Plátano en la Altura (1 cuerda)* [*Model Budget: Plantain in Highlands*] (2022); CORTÉS & DÍAZ, *supra* note 4.

[12] Mildred Cortés, U.P.R., *Empresas Agrícolas de Puerto Rico: Potencial de Desarrllo* [*Agricultural Companies of Puerto Rico: Development Potential*] 19, available at https://www.uprm.edu/tamuk/wp-content/uploads/sites/299/2019/07/Mildred_Cortes_empresas_agricolas_reduced-1.pdf.

[13] Mildred Cortés & Leticia Gayol, *Cambio en las preferncias del consumidor de plátano en Puerto Rico, 2003-2008* [*Change in Consumer Preference for Plantain in Puerto Rico, 2003-2008*], 96 J. AGRIC. U. P.R. 107, 109 (2012).

[14] Ada N. Avlrado Ortiz & Manuel Díaz, *Guía Práctica de Plagas y Enfermedades en Plátano y Guineo* [*Practical Guide to Pests and Diseases in Plantains and Bananas*] AGRIC. Extension Serv., Coll. Of Agric. Scis., U. PR., 13-14, 17-18 (2007), available at https://academic.uprm.edu/aalvarado/HTMLobj-119/PyG-PDF.pdf.

[15] Cortés & Gayol, *supra* note 17, at 110.

the main points of sale of this product.[16] Plantain plantations are very susceptible to hurricanes.[17]

III. Farm Service Agency and the National Table of Crops

The U.S. Department of Agriculture's (USDA) Farm Service Agency (FSA) administers countless programs to assist farmers.[18] Most prominently, FSA handles those programs aimed at providing financing, as lender of last resort, to otherwise underserved farmers, as well as disaster assistance programs. As part of its operation, the Agency adopted the concept of "national crops" in its Non-Insured

Item	Crop name (English)	Crop name (Spanish)	Crop code	Intended use	Practice code	Acreage reporting date	Time to begin harvest	Crop duration in the field	Planting period (See footnote 1)	Harvest period	Planting distance	Plants/ Acre	Expected Yield/Acre	Units	Unharvest factor	Price
43	Nursery, Field	Viveros, Campo	1010 FLD	--	--	5/31/2017	--	--	All year	All year	--	--	--	--	0.75	--
44	Okra	Quimbombó	0286	FH	I	3/31/2019	60-70	--	See Exhibit 1	All year	2.5' x 1'	17,424	20.59	Cwt	0.90	78.58
45	Onion	Cebolla	0142 WHT	FH	N	3/31/2019	110 days	155 days	November-January	December - June	3" x 5" (5)	414,857	154	Cwt	0.90	25.49
46	Onion	Cebolla	0142 WHT	FH	I	3/31/2019	110 days	155 days	November-January	December - June	3" x 5" (6)	414,857	206	Cwt	0.90	25.49
47	Orange, Mandarin	China Mandarina	0023 MND	FH	N	3/31/2019	--	Perennial	--	See Exhibit 1	16' x 16'	170	251	Box (45 lb)	0.70	12.15
48	Orange, Navel	China Nevo	0033 NAV	FH	N	3/31/2019	--	Perennial	--	See Exhibit 1	16' x 16'	170	137	Box (45 lb)	0.70	10.14
49	Orange, Sweet (PR)	China Puerto Rico	0023 SWT	FH	N	3/31/2019	--	Perennial	--	See Exhibit 1	16' x 16'	170	137	Box (45 lb)	0.70	10.14
50	Orange, Valencia	China Valencia	0023 VLN	FH	N	3/31/2019	--	Perennial	--	See Exhibit 1	16' x 16	170	137	Box (45 lb)	0.70	10.14
51	Papaya, Red	Papaya Roja	0181 RED	FH	N	3/31/2019	8 months	2 years	All year	All year	4' x 10'	1,089	206	Cwt	0.80	32.87
52	Papaya, Yellow	Papaya Amarilla	0181 YEL	FH	N	3/31/2019	8 months	2 years	All year	All year	4' x 10'	1,089	185	Cwt	0.80	32.87
53	Passion Fruit	Parcha	0502	FH	N	3/31/2019	--	--	--	June-December	4' x 12'	907	206	Cwt	0.80	40.00
54	Peas-Pigeon	Gandules	0067 PIG	FH	N	3/31/2019	120 days	330 days	--	--	3' x 1'	14,520	10.3	Cwt	0.90	154.64
55	Pepper (GRN)	Pimiento Morrón	0083 GRN	FH	I	3/31/2019	100 days (D) 70 days (T)	155 days (D) 125 days (T)	All year	All year	36" x 12"	14,520	154	Cwt	0.90	92.67
56	Pepper (PIM)	Pimiento	0083 PIM	FH	N	3/31/2019	90 days (D) 60 days (T)	132 days (D) 102 days (T)	All year	All year	36" x 12"	14,520	103	Cwt	0.90	56.93
57	Pepper (PIM)	Pimiento	0083 PIM	FH	I	3/31/2019	90 days (D) 60 days (T)	132 days (D) 102 days (T)	All year	All year	36" x 12"	14,520	154	Cwt	0.90	59.43
58	Pepper, Sweet Cherry	Ají dulce	0083 SWC	FH	N	3/31/2019	90 days	5-8 months	November-February	April-September	36" x 24"	7,260	51	Cwt	0.90	133.53
59	Pepper, Sweet Cherry	Ají dulce	0083 SWC	FH	I	3/31/2019	100 days	5-8 months	All year	All year	36" x 24"	7,260	103	Cwt	0.90	133.53
60	Pineapple	Piña	0185 ABA	FH	N	3/31/2019	--	--	All Year	All year	1.5' x 3.5'	8,297	14.42	Ton	0.73	1060.02
61	Plantain, Common	Plátano Común	0186 COM	FH	N	3/31/2019	See Footnote 7	See Footnote 7	All year	All year	6' x 7'	1,037	134	Cwt	0.92	52.56
62	Plantain, Maricongo	Plátano Maricongo	0186 MAR	FH	N	3/31/2019	See Footnote 7	See Footnote 7	All year	All year	6' x 7'	1,037	134	Cwt	0.92	52.56
63	Plantain, Maricongo	Plátano Maricongo	0186 MAR	FH	I	3/31/2019	See Footnote 7	See Footnote 7	All year	All year	6' x 7'	1,037	180	Cwt	0.92	52.56
64	Pumpkin	Calabaza	0147	FH	N	3/31/2019	120 days (D)	165 days (D)	All year	All year	6' x 6'	1,210	134	Cwt	0.90	20.96

Figure 1: NCT 2018

Crop Disaster Assistance Program (NAP)[19] regulations. This concept refers to types or cultivars that have little price differences, for their most predominant use. The planting area and production for the crop group is summarized in a table called the National Crop Table ("NCT"), like the one seen on Figure 1, which is used to calculate

[16] Based on observations by the author.

[17] Gary L. Miller & Ariel E. Lugo, *Guide to the Ecological Systems of Puerto Rico*, FOREST SERV., U.S. DEP'T OF AGRIC., IITF-GTR-35, 137 (2009).

[18] For statutes authorizing activities performed by FSA, see *Authorizing Statutes*, FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., https://www.fsa.usda.gov/programs-and-services/laws-and-regulations/authorizing-statutes/index (last visited Apr. 29, 2022).

[19] 1-NAP (REV. 2), *Noninsured Crop Disaster Assistance Program for 2015 and Subsequent Years*, ¶200 FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., (2022) [Hereinafter 1-NAP].

losses.[20] This table often collects the following information: planting periods; crop payment code; crop payment code; crop types or varieties (E.g., Maricongo or Common Dwarf plantains); intended use; secondary use; county expected yield ("CEY"); average market price damage factor; unharvested factor (UH); and units of measure; among other.[21]

FSA is required to maintain its county records based on the best available information for yield averages per crop, per land area, and average prices.[22] An Olympic average should be used to set yields and prices. To calculate the yield or price for any given year, data from the five (5) most recent crop years must be obtained, eliminating the highest and lowest values, averaging the remaining three (3).[23] If data is not available, the rules provide alternate methods of calculation that must be carefully followed.[24] County Committees ("CoC") as well as State Committees ("StC") must maintain minutes and documentation to evidence the process used to obtain such averages.[25] This data is used to award compensation under the NAP, and recently, under the Wildfires and Hurricanes Indemnity Program (WHIP).[26]

IV. The Wildfires and Hurricanes Indemnity Program

The Wildfire and Hurricanes Indemnity Program (WHIP) was adopted by the U.S. Congress to compensate farmers for losses suffered due to natural disasters experienced in 2017.[27] FSA was ordered to administer the program. To do so, proper regulation[28] was adopted and the corresponding procedure was implemented under the WHIP Handbook,[29] short references as 1-WHIP. To determine

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[20] For example, see the 2018 NCT published: Javier. Rivera-Aquino, *Dear Farmer, Do You Know How Your Crops Are Valued for Compensation After a Natural Disaster?*, JAVIER A. RIVERA-AQUINO BLOG, app. D, https://javierriveraaquino.com/dear-farmer-do-you-know-how-your-crops-are-valued-for-compensation-after-a-natural-disaster/ (last visited Apr. 29, 2022).

[21] For an example of the data gathered by FSA, see *id.*

[22] 1-NAP, *supra* note 23, ¶ 276(B) (indicates that the expected performance by the county will be based on the best available information provided by any of the following sources: average APH per year, the Department of Agriculture, county committee knowledge, local markets, NASS, NIFA, RMA, Rural Development, as well as other reliable sources such as universities).

[23] *See id.* ¶ 276(C), ¶ 278(D).

[24] *Id.* ¶ 278(D).

[25] *Id.* ¶ 280.

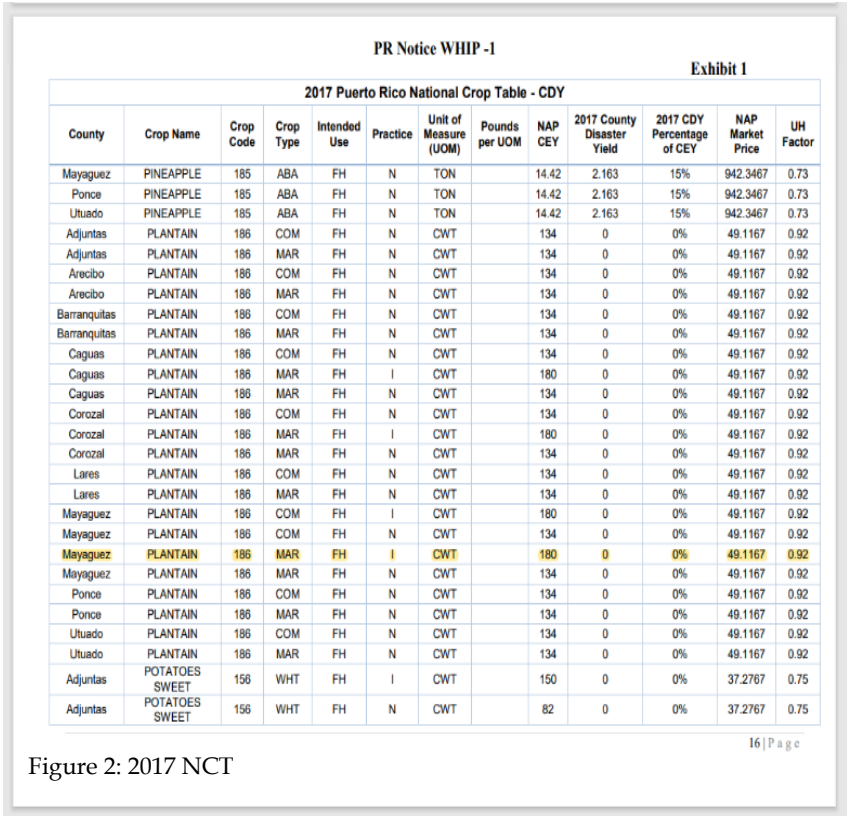
[26] Agricultural Disaster Indemnity Programs, 7 C.F.R. §§ 760.1500—.1517.

[27] 7 C.F.R. § 760.1500.

[28] 2017 Wildfires and Hurricanes Indemnity Program, 83 Fed. Reg. 33,795 (July 18, 2018) (codified at 7 C.F.R. pt. 760).

[29] *See generally* FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., *1-WHIP, Wildfires & Hurricanes Indemnity. Program (2018)* [hereinafter 1-WHIP].

losses, the agency had the responsibility of establishing expected values based on an average price set by the system, times the expected yield for the county per cultivar, times the producers crop acres. A WHIP factor, any harvested portions, and crop insurance payments would be deducted to finally determine a WHIP payment.[30] In jurisdictions of the U.S., loss determinations considered historical yields reported by each farmer. In Puerto Rico, a special provision was adopted for WHIP indicating that FSA could only use the expected yield per crop for each county ("CEY") and average prices found to the 2017 National Crop Table (NCT), seen on Figure 2.[31] This blanket provision was adopted to "ensure disaster assistance" in a "timely and efficient manner."[32]



PR Notice WHIP -1

Exhibit 1

2017 Puerto Rico National Crop Table - CDY

County	Crop Name	Crop Code	Crop Type	Intended Use	Practice	Unit of Measure (UOM)	Pounds per UOM	NAP CEY	2017 County Disaster Yield	2017 CDY Percentage of CEY	NAP Market Price	UH Factor
Mayaguez	PINEAPPLE	185	ABA	FH	N	TON		14.42	2.163	15%	942.3467	0.73
Ponce	PINEAPPLE	185	ABA	FH	N	TON		14.42	2.163	15%	942.3467	0.73
Utuado	PINEAPPLE	185	ABA	FH	N	TON		14.42	2.163	15%	942.3467	0.73
Adjuntas	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Adjuntas	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Arecibo	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Arecibo	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Barranquitas	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Barranquitas	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Caguas	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Caguas	PLANTAIN	186	MAR	FH	I	CWT		180	0	0%	49.1167	0.92
Caguas	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Corozal	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Corozal	PLANTAIN	186	MAR	FH	I	CWT		180	0	0%	49.1167	0.92
Corozal	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Lares	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Lares	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Mayaguez	PLANTAIN	186	COM	FH	I	CWT		180	0	0%	49.1167	0.92
Mayaguez	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Mayaguez	PLANTAIN	186	MAR	FH	I	CWT		180	0	0%	49.1167	0.92
Mayaguez	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Ponce	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Ponce	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Utuado	PLANTAIN	186	COM	FH	N	CWT		134	0	0%	49.1167	0.92
Utuado	PLANTAIN	186	MAR	FH	N	CWT		134	0	0%	49.1167	0.92
Adjuntas	POTATOES SWEET	156	WHT	FH	I	CWT		150	0	0%	37.2767	0.75
Adjuntas	POTATOES SWEET	156	WHT	FH	N	CWT		82	0	0%	37.2767	0.75

16 | Page

Figure 2: 2017 NCT

[30] *See id.* ¶ 210(A-F).

[31] *Id.* ¶ 191(B). The 2017 NCT can be found at Rivera-Aquino, *supra* note 24, app. A, at 16.

[32] 1-WHIP, *supra* note 33, ¶ 191(A).

V. The Effect of the NCT on WHIP's Plantain Compensation in Puerto Rico

Since the data on the NCT was used to compensate the losses caused by Hurricane Maria, a deep dive at its content is needed to understand what was compensated and how. For the purposes of WHIP compensation, only the loss of plantain harvest or yield was considered; plantation was determined not eligible.[33] This contrasts with the payment of farm insurance offered by the Puerto Rico Crop Insurance Corporation (CSA for its Spanish acronym), which only considers compensation for plantation losses.[34]

The NCT used for WHIP payments was adopted through the "*PR Notice WHIP-1*;" plantains are found on page 16.[35] The code for plantains is 186 and only includes the Maricongo (Mar) and Common Dwarf (Com) varieties. Under the "intended use" column, the nomenclature adopted is for fresh use ("FH"). In the "practice" column, there are irrigated ("I") plantains or non-irrigated ("N"). The alleged source of data, the PRDA, does not measure plantain farm output as either irrigated or not irrigated. The UPR, as said before, differentiates plantains between Highlands and Semiarid zones. The unit of measurement used is the "Hundredweight" or "CWT" (in Spanish, "quintales" or "QQ") when typically, in Puerto Rico, the unit used is "per fruit" or "thousands of fruits", almost never in pounds, CWT or kilograms. For example, the PRDA, measures plantains in "thousands of fruits", as it can be seen on the "*Agricultural Gross Income Report*"[36] so, does the National Agricultural Statistics Service.[37] According to the NCT, the expected average plantain production, for all counties in Puerto Rico, has remained unchanged since 2013, at 180 CWT in irrigated plantations and 134 CWT for plantations without irrigation.[38] This crop does not reflect a county disaster yield (CDY). The average price set for 2017 is $49.1167/CWT or $0.4912 per pound.[39] The discount factor for not having incurred in cost of harvesting the crop ("unharvested factor") is 92%.[40] The "WHIP factor" may vary depending on

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[33] *Id.* ¶ 140(B). Notice that in the *PR Notice* WHIP-1, Exhibit 2, found at Rivera-Aquino, *supra* note 24, app. A, enumerates plantations, and plantains is not among them.

[34]For the 2017-2018 Insurance Program for the Puerto Rico Crop Insurance Corporation, see Rivera-Aquino, *supra* note 24, app. G.

[35] *Id.* app. A, at 16.

[36] *Id.* app. B, at 2, 7.

[37]NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. *supra* note 7, at 19 tbl. 15.

[38] *See* Rivera-Aquino, *supra* note 24, at app. B.

[39] *Id*. app. A, at 16. Price per pound was converted CWT dividing by 100.

[40] *Id.*

whether it was insured; as stated before, CSA does not offer crop insurance for plantain harvest, just plantation.

The NCT for 2018 includes additional values (not publicized in the 2017 NCT) that shed light on the considerations taken by FSA for Plantain crops.[41] Among them: the "planting period", which for plantain is the entire year; the "planting distances" considered for this cultivar being six (6) feet by seven (7) feet; and, therefore, the "density of plants" per acre considered, for plantains being 1,037 (1,077 plants per "cuerdas").[42] The average price of plantains in 2018 was set at $52.56/CWT or $0.5256/pound.[43] There is also a column indicating the duration in the field, in the case of plantains with a footnote referencing information provided by the UPR in 1999.[44] At the bottom of the 2018 NCT, it also indicates that its data source is the P.R. Gross Agricultural Income Report provided by the PRDA's Agricultural Statistics Division in fiscal year (FY) 2013/2014.[45] The 2018 NCT was adopted in November 2018. From a request under the Freedom of Information Act (FOIA) made to FSA, pursuant to what conversion factors were utilized for plantains, a "PR Notice CM-2" document was released FSA uses a conversion factor of 1,000 plantains equivalent to seven hundred (700) pounds. [46]

If the data for the NCT comes from the PRDA's Agricultural Statistics Service, why does FSA convert the unit of measuring of plantains instead of utilizing the same unit from their source? Where does the conversion factor come from? How accurate is it? These are all questions that to this date are still without an answer.

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[41] *See id.* app. D.
[42] *Id.* app. D, at 3.
[43] *Id.*
[44] Javier. Rivera-Aquino, *Dear Farmer, Do You Know How Your Crops Are Valued for Compensation After a Natural Disaster?*, JAVIER A. RIVERA-AQUINO BLOG, app. D, at 4 n.7, https://javierriveraaquino.com/dear-farmer-do-you-know-how-your-crops-are-valued-for-compensation-after-a-natural-disaster/ (last visited Apr. 29, 2022).
[45] *Id.* app. D, at 4. According to source referenced in the 2018 NCT, data was obtained from the PR Agricultural Gross Income as of November 29, 2016, the final data for the 2013/2014 and the preliminary 2014/2015 data reported. Per the author's research, the following database reported for the Agricultural Gross Income, containing corrected information for 2013/2014 and preliminary data for 2014/2015 through 2016/2017 was not available until November 4, 2019. *Id.* app. B, at 1-5. Agricultural Gross Income containing preliminary data for 2016/2017 through 2018/2019, was not publicized until April 27, 2021. *Id.* app. B, at 6-10.
[46] On August 12, 2020, the author requested certain information on conversion factors for agricultural crops used by FSA into P.R., under the Freedom of Information Act of 1996 (FOIA). For the conversion factor of plantains, see *id.* app. E, at 10, 23. The document makes no reference to the source from which this conversion factor was obtained.

Seemingly, PRDA and FSA failed to share data between 2014 and 2019. If PRDA fails to report statistical data to FSA, what other sources does FSA has to supplement up-to-date farming production information? Knowing the answer to these questions is of utmost importance, so farmers and authorities can standardize production reports and obtain reliable data. Additional (FOIA) requirements were made to FSA to obtain historical NCT's. The following information for plantains was gathered:

Table 1.1: Average yield (in CWT) per acre and average price for Plantain cultivation according to FSA-NCT.[47]

Plantains	2012	2013	2014	2015	2016	2017	2018
Average Yield	130 N 175 I	134 N 180 I	134 N 180 I	134 N 180 I	134 N 180 I	134 N 180 I	134 N 180 I
Average Price	$38.3667	$42.23	$40.5733	$52.56	$52.56	$49.1167	$52.56

N = non-irrigated, I = irrigated.

Since a reference is made to the PRDA's Gross Agricultural Income Report[48], the Plantain data used in these reports and the averages resulting from such data are summarized below:

Table 1.2: Annual Plantain Production according to the PRDA Gross Agricultural Income Report.[49]

Plantains Average Price	2010	2011	2012	2013	2014	2015	2016	2017
-Thousands of Fruits	$269.12	$295.6	$366.5	$371.4	$367.89	$283.1	$330.6	$309.8
-Per Fruit	$0.2691	$0.2956	$0.3665	$0.3714	$0.3679	$0.2831	$0.3306	$0.3098
Production								

[47] *See* Javier. A. Rivera-Aquino, *Dear Farmer, Do You Know How Your Crops Are Valued for Compensation After a Natural Disaster?*, JAVIER A. RIVERA-AQUINO BLOG, app. C, at 16, 41, 57, 67, 73, 84, 96, https://javierriveraaquino.com/dear-farmer-do-you-know-how-your-crops-are-valued-for-compensation-after-a-natural-disaster/ (last visited Apr. 29, 2022).

[48] To access this report, see *id.* at app. B.

[49] Data compiled from the revised figures for the Agricultural Gross Income reports dated 11/29/2016 and 4/11/2019. See *id.* app. B, at 2, 7.

-Thousands	256,913	154,643	117,700	119,404	209,012	255,818	179,544	245,884
-Acreage	N/A	N/A	N/A	N/A	N/A	8,857.64	7,104	9,125.86
-Average Yield (in Thousands)/ "Cuerda"[50] (Acre)	N/A	N/A	N/A	N/A	N/A	28.81 (27.97)	25.27 (24.53)	26.94 (26.16)

Another source of information on plantains is the Agricultural Census conducted by the USDA's National Agricultural Statistics Service, which is typically conducted every five (5) years, although the most recent was delayed because of Hurricane María. This data was obtained in 2018 and was not released until 2020.

Table 1.3: Average Production Based on Data from the NASS Agricultural Census. [51]

Plantain – Harvested	2007	2012	2017
	9,437,462	11,955,808	6,273,622
Units (fruits)	249,948,000	405,256,000	169,073,000
Average Fruit/Plant[52]	26.48	33.9	26.95
Average Plants/ "Cuerda" (Acre)[53]	916.31 (889)	876.82 (850)	974.49 (946)

Additionally, there is data from the UPR, specifically the model budget for plantains, which estimates average yields and prices for the product.[54]

[50] *Id.* This figure, results from the division of thousands produced between the "cuerdas" in production.

[51] NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., AC-12-A-52, *2012 Census of Agriculture: Puerto Rico: Island and Municipio Data* 133 tbl. 46 (2014); NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. *supra* note 7, at 19 tbl. 15.

[52] Dr. Alexandra Gregory, from the Department of Agricultural Economics of the UPR in Mayagüez, assisted in the computation of these data, particularly in the estimation of the averages of "plants/acre" and "fruits/plant."

[53] *Id.*

[54] *See* Rivera-Aquino, supra note 24, app. F.

Table 1.4: Average Production Based on Data from the UPR Plantain Model Budget. [55]

Plantain – Harvested	Highland/Humid	Coastal/Semiarid	Average
Average Fruits/ "Cuerda" (Acre)	30,000[56] (29,130)	42,075[57] (40,854)	36,037.5 (34,992)
Average Plants/ "Cuerda" (Acre)	850[58] (825)	1,100[59] (1,068)	975
Average Fruit/Plant[60]	35.29	38.25	36.77

From the analysis and associations of these data sets, important assumptions and pieces of information can be obtained. A contrast is here performed, between the "NCT" and other sources of information, to determine whether the compensation was fair and how in future instances it can improve. Three areas will be subject of review: 1) Plant Density; 2) Average Yields; and 3) Average Price.

A. Acreage Density

This element is of vital relevance since FSA must reflect accurately the data average per county. According to the UPR, farmers in counties that are predominantly coastal or semiarid areas, are likely to use irrigation, and have greater plant density than those in the highlands, likely not to use irrigation.[61] For example, a farmer from the highlands who, plants ten (10) "cuerdas" (9.71 acres) of plantains at the rate of 850 plants per "cuerdas," following UPR's recommendation, will have a total of 8,500 plants in total. However, if the farmer reports total plants, FSA will divide that number, 8,500, by the density by 1037 plants per "acre," as stated on the NCT, for the acreage determination, which will result in 8.21 acres: one and one half (1.5) acres less to which the WHIP Payment will not be applied.

[55] *See id.*
[56] *Id.* Note "venta de plátanos" or sale of plantains, "millar" or thousands, in the quantity of 30.
[57] *Id.* Note "venta de plátanos" or sale of plantains, in the quantity of 42,075.
[58] *Id.*
[59] *Id.*
[60] Divide Average fruits per acre by average plants per acre to obtain average fruits per plant.
[61] *See* CORTÉS & DÍAZ, *supra* note 14, at 2 n.1; *Mildred Cortés & Manuel Díaz, Presupuesto Modelo: Plátano en lo Llano* (1 CUERDA) [*Model Budget: Plantain in Plains*] n.1 (2022), U. P.R., available at https://www.mercadeoagricolapr.com/herramientas/presupuestos-modelo/.

Table 2.1.1: Planting densities for Plantain cultivation according to various sources (UPR/FSA).[62]

Plants per Acre	UPR	FSA	Difference
Highland	825[63]	1037	212
Semiarid or Coastal	1068[64]	1037	-31

According to the 2017 NCT, one non-irrigated acre, as typically occurs in the highlands, produces 134 CWT at a price of $49.1167, for a value of $6,581.6378 per acre.[65] If 1.5 acres of plantains are not considered, $9,872.46 will not be part of the computation for compensation under WHIP under this scenario. The UPR, is the only source that distinguishes between two different practices in plantain cultivation, clearly stating that the Semiarid areas utilize irrigation whereas such recommendation is not made to farmers in the Humid areas.[66]

Since the data of the 2017 Agricultural Census was not collected until 2018 and was not published until 2020, the Census information available to FSA in 2017 was the 2012 Agricultural Census. NASS data makes no distinction between plantain "cuerdas" with irrigation or without irrigation, nor between highland or coastal areas. Therefore, it is unlikely that this data is being used by FSA. Still, for the sake of dataset comparison, the average density obtained from NASS when compared with the NCT shows a difference of 187 plants per acre.

[62] *See* Rivera Aquino, *supra* note 7, app A. Comparison between data from Table 1.4 and the 2017 NCT.

[63] 850 plants per "cuerda" are planted in the highlands. CORTÉS & DÍAZ, *supra* note 14, 2 n.1. If multiplied by the equivalence of "cuerdas" to acres, 0.971, results in 825 (825) plants.

[64] Around 1,100 plants are planted per "cuerda" in the semiarid zone. CORTÉS & DÍAZ, *supra* note 65, at n.1. If multiplied by the equivalence of "cuerdas" to acre, 0.971, results in 1068.

[65] Rivera-Aquino, *supra* note 24, app. A, at 16.

[66] CORTÉS & DÍAZ, *supra* note 14; CORTÉS & MANUEL *supra* note 4. Irrigation is a cost for the Semiarid, Coastal plains, whereas it is not recommended for the Highland, Humid regions.

Table 2.1.2: Planting densities for Plantain cultivation according to various sources (NASS/FSA).[67]

Plants per Acre	NASS 2012	FSA	Difference
Highland	850[68]	1037	187
Semiarid or Coastal		1037	187

Unfortunately, there is not enough data from the PRDA to determine the average density of plants per acre. So, where exactly does the NCT plant density comes from? How the dataset is built is not fully understood, but it seems to mix and match (or mismatch) several sources at once.

B. Acreage Yield

In the case of Puerto Rico, instead of taking the individual data from each farmer,[69] the yield averages of each county or region (CEY) from the NCT were utilized. [70] The weight of this factor in the calculation of compensations under programs such as the "NAP" or the WHIP is substantial.

As stated before, data from both PRDA and from NASS measure Plantain production in "thousands of fruits," while FSA uses CWT as a unit of measurement, based on a conversion factor that indicates that, for every 1,000 Plantain fruits, a weight of seven hundred (700) pounds will be presumed.[71] In other words, each Plantain must weigh 0.7 lbs. or 11.2 ounces.[72]

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[67] Rivera-Aquino, *supra* note 7, app. A, at 16. A comparison between data from Table 1.3 and Appendix A.

[68] According to USDA/NASS reflects 876 plants per "cuerda", which adjusted to acres ("x 0.971") result in eight hundred and fifty (850) plants. NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. *supra* note 7, at 105.

[69] FSA encourages farmers to yearly file _, Report of Acreage, to maintain historical records of production. *See* FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., FSA-578, REPORT OF ACREAGE (2003), available at https://forms.sc.egov.usda.gov/efcommon/eFileServices/eFormsAdmin/FSA0578MANUAL_031015V01.pdf.

[70] According to the Noninsured Crop Disaster Assistance Program Handbook, CEY should reflect the average production potential in the county by practice and intended use. 1-NAP, *supra* note 23, ¶ 276.

[71] This information was obtained through a FOIA, and appears published Rivera-Aquino, *supra* note 24, app. E, at 10.

[72] The average weight per Plantain fruit with sigatoka treatment was 320.8 grams, which equals to 11.28 ounces. Note that the average fruit per bunch (therefore, per plant) of Plantain variety with treatment for Sigatoka was forty-seven (47) fruits. In

A second element that must be carefully analyzed, is that since 2013, the average yields per acre have been the same, without considering variations in rainfall, pest effects, etc., which tend to influence crop yields. If the source of data has been the PRDA, as claimed by FSA, productions between 2010 and 2014 should reflect variations.

i. Pounds per Plant (Cluster)

By performing a conversion from Hundredweight to pounds, the dividing the pounds by the total number of plants the NCT says exist in an acre, the weight per plant can be determined.

Table 2.2.1: Equivalence of Plantain Weight per Plant (Bunch).[73]

NCT	Irrigated Acre	No Irrigated Acre
Plants	1,037	1,037
Hundredweight	180	134
Pounds	18,000	13,400
Pounds per plant	17.35	12.92

ii. Plantains per Acre according to "NCT"

If the average production considered by FSA is taken into consideration, against its own conversion factor, an important piece of data can be obtained on the average fruits per acre.

Table 2.2.2: Plantain Fruit Equivalency per Acre.[74]

	Acre (Irrigated)	Acre (Not Irrigated)
Pounds	18,000	13,400
Divided by conversion factor[75]	0.7	0.7

the case of untreated plants, the average weight per fruit is 229 grams or eight (8) ounces, with thirty-seven (37) fruits per raceme. It is not known whether this is the source of information for establishing the conversion factor, but the coincidence is remarkable. *See* Agenol González-Vélez, *Behavior of Plantain Clones Maricongo and FHIA -21 Under the Presence of the Black Sigatoka at the Humid Uplands of Puerto Rico*, 98 J. AGRIC. U. P.R. 21, 25 (2014).

[73] Using data on the 2017 NCT, converting hundredweight to pounds, then dividing pounds per plant. *See* Rivera-Aquino, *supra* note 7, app. A.

[74] *Id.* (according to FSA data found on the 2017 NCT).

[75] Per FSA's PR Notice CM-2, 1,000 Plantains equals seven hundred (700) pounds, therefore, one plantain equals 0.7 lbs. or 11.2 oz. *See* González-Vélez, *supra* note 76, at 25.

Fruits per acre	25,714.3	19,142.8

iii. Plantains per Acre according to UPR, PRDA and NASS compared to "NCT"

The following differences in plantain production per acre between FSA and UPR data, can be inferred considering that in the semiarid or coastal zones, plantain is cultivated with irrigation, and that, in the Highlands, being humid, plantain is cultivated without irrigation.

Table 2.2.3: Contrast between to FSA and UPR Plantain Fruit Production/Sales per acre.[76]

Production per Acre	With irrigation	No irrigation
Fruits per Acre based on FSA Data	25,714.3	19,142.8
Fruits per Acre based on UPR Data	42,075	30,000
Difference	-16,360.7	-10,857.20
x conversion factor	0.7	0.7
Difference in pounds	-11,452.49	-7,600.04
Difference in CWT	-114.52	-76.00
x NCT average price	$49.1167/QQ	$49.1167/QQ
Not Considered for Compensation	-$5,625.08/Acre	-$3,732.88/Acre

In the case of Semiarid zone with irrigation, there are 11,452 pounds that are not being considered by FSA, when compared with the UPR data; in the case of Highlands without irrigation, 7,600 pounds, not considered, after applying the Agency's conversion factor.[77] This difference results in a drastic reduction in compensation. If the pounds are converted to hundredweight, and

[76] Comparison between the 2017 NCT (Rivera-Aquino, *supra* note 24, app. A, at 16) and *Presupuesto Modelo para el Cultivo de Plátano en Zona de Altura de Puerto Rico* (Mildred Cortés & Manuel Díaz, *Gastos e ingresos proyectados para la producción de una cuerda de plátanos con una densidad de 1,000 plantas en la zona de altura húmeda de Puerto Rico* [*Projected Expenses Revenues for the Production of a "cuerda" of Plantains with a Density of 1,000 Plants in the Humid Altitude Zone of Puerto Rico*] (n.d.), available at https://www.mercadeoagricolapr.com/wp-content/uploads/2019/11/Copy-of-pl%C3%A1tano-altura.pdf), and, *Presupuesto Modelo para el Cultivo de Plátanos en la Zona Semiárida de Puerto Rico* (CORTÉS & DÍAZ, *supra* note 4).

[77] In other words, if multiplied by 0.7 for each of the production differences. *See* Rivera-Aquino, *supra* note 24, app. E.

multiplied by $49.1167/CWT, the difference reflects $8,035 in the Semiarid zone with irrigation, or $3,732.88 in the Highlands, not being compensated.

It is important to bear in mind that in 2018, there were 1,363 plantain farms in Puerto Rico, with 10,624 "cuerdas" (10,315 acres), right after Hurricane Maria.[78] Although it is difficult to predict how much was not compensated, imagine the impact in dollars if the amounts not considered were compensated. If the least amount on Table 2.2.3 is taken, $3,732.88 per acre, $38,504,657.20 were not considered for plantains, assuming the NCT average price is accurate. This amount will be utilized later to estimate WHIP payments not considered.

Since FSA indicates that prior to the hurricane, it only had PRDA data available until 2014, and since then, PRDA's data was not captured, it is questionable how FSA calculates its Olympic averages, beyond that date. For illustrative purposes, of the years in which the PRDA did reflect acreage data, the year 2017 is chosen to show the differences in fruits per acre.

Table 2.2.4: Contrast between Plantain Fruit Production per acre according to FSA and PRDA 2016 data.[79]

Production per Acre	Semi-arid zone/with irrigation	Highlands/no irrigation
Fruits Based on FSA Data	25,714.3	19,142.8
Fruits Based on PRDA Data	26,160	
Difference	445.7	-7,017.20

Table 2.2.5: Contrast between Plantain Fruit Production per acre according To FSA and NASS 2012 data.[80]

Production per Acre	Semiarid/irrigated zone	Highland/no irrigation
Fruits Based on FSA Data	25,714.3	19,142.8
Fruits according to NASS	29,724[81]	

[78] NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. *supra* note 7, at 19 tbl. 15.
[79] *See supra*, Table 1.2 & Table 2.2.2.
[80] *See supra.* Table 1.3 & Table 2.2.2.
[81] It is calculated by multiplying 876.82 "plants" per acre, estimated according to data from the NASS 2012 for Plantains on Table 1.3, by 33.9 fruits per plant. NASS

Difference	-4,009.9	-10,581.2

Considering the data through NASS, marked differences in production are reflected. About 4,010 fruits per "cuerdas" in zones semiarid with irrigation; 10,581 fruits difference in the Highlands without irrigation. Again, the effect of this difference shows a trend towards reduced disaster loss compensation.[82]

iv. Plantains per Plant (Raceme) according to FSA

Since data is collected per "thousand units", meaning "thousand fruits", by both PRDA and NASS,[83] it is important to understand what the average amount of fruits per plant looks like. In the case of FSA, the average number of fruits per plant or raceme using irrigation is just 24.79; without irrigation, the average is 18.46.[84]

Table 2.2.6: Average Fruits per Bunch according to "NCT"[85]

Acre	Irrigated	Not Irrigated
Fruits	25,714.3	19,142.8
÷ Plants/acre[86]	1,037	1,037
Fruits/Plant	24.79	18.46

data does not distinguish between zones or practices. NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., *supra* note 55, at 10.

[82] If the pounds are converted to quintals, and multiplied by $49.1167/QQ, the difference reflects about $1,969.08 in the semi-arid zone with irrigation or $5,197.13 in the highlands, which seemingly were not part of the FSA compensation calculation. Rivera-Aquino, *supra* note 24, app. E.

[83] Bear in mind that data is collected on the field by PRDA, on a yearly basis, and NASS every five (5) years. There is no known set of data independently gathered by FSA.

[84] This data was calculated by using Table 2.2.2 and then dividing by the number of plants according to the source (the 2017 Puerto Rico National Crop Table published Rivera-Aquino, *supra* note 24, app. A, at 16) which is 1,037.

[85] Rivera-Aquino, *supra* note 24, app. A, at 16.

[86] According to FSA, one acre has a density of 1,037 plants.

FSA's own PR Notice CM-2[87], states that one (1) "cuerda" (0.971 acres), has between 800 to 1,000 plants and that there are 40 plantains per bunch (thus per plant) for a total 25,000 plantains per cuerda. The arithmetic in this document is erroneous. If each plantain plant has one (1) bunch (or raceme), and each bunch has 40 plantains (fruits), the yield per "cuerda" is between 32,000 (if 800 plants/ "cuerda"), to 40,000 (if 1,000 plants per cuerda). Thus, the average weight according to the conversion factor on p. 8 (1,000 plantains = 700 pounds), should yield 224 CWT to 280 CWT per "cuerda", or 217.5 CWT and 271.9 CWT per acre, instead of 134 CWT or 180 CWT per acre which appear on the 2017 NCT's County Expected Yield (CEY). [88] There is a difference of 110 to 100 CWT less in the 2017 NCT if compared to the yield information seen on the Puerto Rico Notice CM-2. According to the 2017 NCT, the price for plantain was $49.1167/CWT. This difference amounts $4,911.67 not considered for compensation, per acre, in the 2017 NCT. This information will later be used to approximate non-compensated portions to plantain farmers under WHIP.

v. Plantains per Plant (Raceme) according to NASS compared to FSA

Even within the USDA, the difference in fruits per raceme seems to be at odds. Data from the 2012 NASS is here used, as it was the one available in 2017.

Table 2.2.8: Contrast between Plantain Fruit Production per raceme or plant according to FSA and NASS data.[89]

Fruits per Plant/Maricongo	FSA	NASS 2012	Difference
Highland/Not Irrigated	18.46	33.9	-15.44
Semiarid/ Irrigated	24.79		-9.11

vi. Plantains per Plant (Raceme) according to UPR and compared to FSA

In their field studies, the UPR has averaged fruit production per raceme. This is another perspective where the NCT reflects diminished yields.

[87] Copy of this Notice can be found at Rivera-Aquino, *supra* note 24, app. E, at 5-7.
[88] *See Id*.; Rivera-Aquino, *supra* note 24 app. A, at 16.
[89] *See supra*, Table 1.3 & Table 2.2.6.

Table 2.2.7: Contrast between Plantain Fruit Production per raceme or plant according to FSA and UPR data.[90]

Fruits per Plant/Maricongo	FSA	UPR	Difference
Highlands/Not Irrigated	18.46	35.29[91]	-16.83
Semi-arid/ Irrigated	24.79	38.25[92]	-13.46

C. Price

Another determining factor in compensation setting is price. Not estimating correctly, the average price of plantains at the farm gate will have an adverse effect on the calculation for compensation under programs such as the NAP or the WHIP. An Olympic average must be used. According to FSA data, 1.42 plantains are equivalent to one pound.[93]

i. Price per Pound and Per Fruit according to NCT

First, a conversion using simple arithmetic from CWT to pounds must be performed. To obtain the average price per fruit, the equivalence of fruits necessary to reach one pound is applied.

Table 2.3.1: Equivalence of Plantain Price per Pound and per Fruit according to data in NCT.[94]

Plantains	2012	2013	2014	2015	2016	2017	2018
Price/CWT	$38.3667	$42.23	$40.5733	$52.56	$52.56	$49.1167	$52.56
Price/Lb.	$0.3837	$0.4223	$0.4057	$0.5256	$0.5256	$0.4912	$0.5256

[90] *See supra*, Table 1.4 & Table 2.2.8.

[91] According to the Model Budget for Plantains in the Highlands, an estimated 30,000 fruits are estimated on a "cuerda" with a density of 850 plants. To convert to acre, the production must be multiplied by 0.971. *See* Cortés & Díaz, *supra* note 80, at 1 n.1.

[92] According to the Model Budget for Plantains in the Semi-Arid Zone, an estimated 42,000 fruits are estimated on a "cuerda" with a density of 1,100 plants. To convert to acre, the production must be multiplied by 0.971. *See* Cortés & Díaz, *supra* note 4, at 2 n.1.

[93] By dividing seven hundred (700) pounds by 1,000 Plantains based on FSA conversion factor. *See* Rivera-Aquino, *supra* note 24, app. E, at 10, 23.

[94] Obtained from the compilation of NCTs 20212-2018, through a FOIA query, published Rivera-Aquino, *supra* note 24, app. C, at 16, 41, 57, 67, 73, 84, 96; dividing CWT by 100 to obtain pounds.

Price/Fruit [95]	$0.2702	$0.2973	$0.2857	**$0.3701**	**$0.3701**	$0.3459	**$0.3701**

Do notice that between 2012 and 2016, and upward movement in prices was reflected. Also notice that the prices in 2015, 2016 and 2018, are the same. Yet the year Hurricane María was experienced, 2017, the price fell by three (3) cents below 2015, 2016, and 2018.

ii. Price per Unit (Fruit) according to the PRDA, the UPR and NASS

If the average production considered by FSA is taken into consideration, against its own conversion factor, an important piece of information can be obtained on the average fruits per acre.

Table 2.3.2: Price equivalence for each Plantain Fruit according to the PRDA Gross Agricultural Income Report.[96]

Plantains Average Price	2010	2011	2012	2013	2014	2015	2016	2017
-Thousand Fruits	$269.12	$295.6	$366.5	$371.4	$367.89	$283.1	$330.6	$309.8
-Per Fruit	$0.2691	$0.2956	$0.3665	$0.3714	$0.3679	$0.2831	$0.3306	$0.3098

PRDA average prices show increasing numbers that peaked in 2013, and from there decreased by as much as six (6) cents in 2017.Figures from NASS Agricultural Census for 2012, estimate the total value of plantains as $80,505,103.00, with an estimated production of 405,256,000 plantains.[97] This averages a price per fruit of $0.19, below all FSA estimates. Average price used by the UPR's model budget for plantain is $0.30.[98]

[95] To calculate price per fruit, the price per pound is divided by the number of fruits that make up one pound according to FSA, in this case, 1.42.
[96] This price equivalency is obtained from data on Rivera-Aquino, *supra* note 24, app. B, at 1-10.
[97] *See* NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. *supra* note 55, at 15 tbl. 12.
[98] CORTÉS & DÍAZ, *supra* note 4.

iii. Average Olympic Price using PRDA's Gross Agricultural Income Report

According to FSA rules, to obtain the Olympic average, you must have the 5 years immediately consecutive, prior to the year for which you want to perform the calculation, remembering to discount the highest and lowest value, averaging between the remaining three values. According to the NCT of 2018, the last set of data available to FSA in 2017 was 2013/2014, so, in 2015, they should have to their avail the required 5 years, between 2009/2010 and 2013/2014. There are exceptions when data is not available. What exactly has been the source of information FSA used when PRDA did not deliver its statistical report is yet to be determined.

Table 2.3.3: 2015 Olympic Average according to data from the PRDA's Gross Agricultural Income Report.[99]

Plantain	2010	2011	2012	2013	2014	Average 5 yrs.	Olympic Avg.
Price	$0.2691	$0.2956	$0.3665	$0.3714	$0.3679	$0.3341	$0.3321

The average Olympic price for plantains (per fruit) obtained from the PRDA data for 2015, does not coincide with the data of the "NCT" for the same year.

Table 2.3.4: Olympic Average Prices for 2017 and 2018 according to data from the NCT itself.[100]

Plantain	2012	2013	2014	2015	2016	Average 5 years	Olympic Average 2017
Price/ Fruit	$0.2702	$0.2973	$0.2857	$0.3701	$ 0.3701	$0.3187	$0.3177
Plantain	2013	2014	2015	2016	2017	Average 5 years	Olympic Average 2018
Price/ Fruit	$0.2973	$0.2857	$0.3701	$0.3701	$ 0.3459	$0.2646	$0.3378

As seen on table 2.3.4, the NCT equivalent price per fruit for 2017 is $0.3459 and for 2018 is $0.3701. Therefore, it must be ruled out that data from the NCT itself was utilized to produce the average prices in the respective years above discussed.

[99] Based on data found on published Rivera-Aquino, *supra* note 24, app. B, at 2.
[100] Using input from Rivera-Aquino, *supra* note 24, app. C, at 16, 41, 57, 67, 73, 84 and 96.

D. Compensation under WHIP

According to 1-WHIP, eligible acres includes acreage of initial crops and subsequent crops in multiple planting periods.[101] Yield data used for WHIP for all Puerto Rico producers, must be the County Expected Yield (CEY).[102] Payment calculations in WHIP "will be calculated on a crop-by-crop basis, for all acreage of the crop within the unit (not just acreage affected by a hurricane or wildfire)."[103] There is also a "WHIP Factor" to be applied, which for this case of an uninsured crop is sixty five percent (65%).[104] Payments received (such as RMA indemnities, NAP payments, secondary use, or salvage value payments) are to be subtracted. An "Unharvest Factor" (UH) must be applied as well.[105] It also states that payment factors will be applied to WHIP payments "when significant and variable harvesting expenses are not incurred because the crop acreage was either prevented from being planted or planted but not harvested."[106] Also, "WHIP production includes all harvested production, unharvested appraised production."[107] When "[c]rops with multiple planting periods within the same crop year [they] are identified as a separate WHIP pay grouping"[108] while "[c]rops with the same planting period will be grouped together unless they have different pay crop and payment type codes."[109]

For the sake of illustrating the extent of the effect of the 2017 NCT, two examples of farmers are adopted: a Coastal Plantain Farmer who utilizes irrigation; and a Highland Farmer who does not utilizes irrigation. To maintain the exercise simple enough, ten "cuerdas" (9.71 acres) dedicated to cultivating plantains are assigned

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[101] *See* 1-WHIP, *supra* note 33, ¶90(C).
[102] *See id.* ¶ 191.
[103] *See id.* at ¶ 210.
[104] *See id.*
[105] *Id.*
[106] *Id.*
[107] *Id.* ¶ 110 (B): Appraised production is production determined by FSA, or an insurance provider approved by FCIC, that was unharvested, but was determined to reflect the crop's yield potential at the time of appraisal. It is important to note that when a producer certifies that acceptable record of harvested production is not available from any other source, an assigned yield based on CDY provision applies. Harvested production means the total amount of harvested production for the unit supported by an acceptable record and/or certification by the producer. The production of any eligible crop harvested more than once in a crop year will include the total harvested production from all harvests.
[108] *Id.* ¶ 63 (D).
[109] *Id.*

to each.[110] Because CSA only covers plantation,[111] and WHIP only considers crop losses, no indemnities for crop insurance are deducted in these examples, and the lowest WHIP factor is applied.

i. Coastal Plantain Farmer

Based on the information derived from the previous discussion, the following can be said about this farmer: a) Plantain plant density per acre is 1,100 according; b) if FSA converts this plant density unto acres, it results in 10.6 acres; c) NCT's CEY is 180 CWT per acre for irrigated plantains; d) CEY utilizing UPR's data, after being converted from units to weight, is 286 CWT; e) CEY based on PRDA's data is 171 CWT/acre; f) 2017 prices according to the NCT were $49.12/CWT; g) Assuming that UPR's estimated prices are for the same period, once converted into price per weight, it results in $42.86/CWT; h) PRDA's price conversion results in $44.26/CWT.

Following 1-WHIP, once acreage is determined, production value is calculated. After this value is calculated, and the WHIP Factor, Unharvested Factor, and Indemnities[112] are all subtracted the following compensations result:

Table 2.4.1: Coastal Farmer WHIP Compensation vs Expected Compensation using UPR and PRDA Data.[113]

WHIP Using	Plantain Acres	Production (CWT)	Value	Expected Compensation	Difference (NCT-Others)
NCT	10.6	1,909	$93,781	$56,081	0
UPR	9.71	2,776	$119,010	$71,186	-$15,086

[110] The arithmetic for each example can be found at Rivera-Aquino, *supra* note 24, app. F.
[111] *Id.* app. G, at 7.
[112] Since WHIP compensation is only for harvest (or production) and not for the plant, as stated on 1-WHIP, *supra* note 33, ¶140, no compensation is deducted, because the CSA only covers plantation losses. Rivera-Aquino, *supra* note 24, app. G, at 4.
[113] For an in-depth detail on the calculations, see Rivera-Aquino, *supra* note 24, app. F.

PRDA	9.71	1,667	$73,811	$44,139	$11,941

For a Coastal Plantain Farmer, if the data from the UPR had been adopted by the NCT, $15,086.00 more would have been compensated for 10 "cuerdas" or 11,000 plants. On the other hand, if the data used had been that from the PRDA, $11,941.00 less should have been paid. If data from the UPR had been used, this Coastal farmer would have received $15,086 more in WHIP payment. If data from the PRDA had been used, the same farmer would have been overpaid $11,941. Of course, the PRDA data does not reflect the effect of irrigation in plantain production, nor the higher density of plants in Coastal plains.

ii. Highland Plantain Farmer

Based on the information derived from the previous discussion, the following can be said about this farmer: a) Plantain plant density per acre is 850; b) if FSA converts this plant density into acres, it results in 8.19 acres; c) NCT's CEY is 134 CWT per acre; d) CEY utilizing UPR's data, after being converted from units to weight, is 204 CWT; e) CEY based on PRDA's data is 171 CWT/acre; f) 2017 price according to the NCT was $49.12/CWT; g) Assuming that UPR's estimated prices are for the same period, once converted into price per weight, it results in $42.86/CWT; h) PRDA's price conversion results in $44.26/CWT.

Following 1-WHIP, once acreage is determined, production value is calculated. After this value is calculated, and the WHIP Factor, Unharvested Factor, and Indemnities[114] are all subtracted the following compensations result:

Table 2.4.2: Highland Farmer WHIP Compensation vs Expected Compensation using UPR and PRDA Data.[115]

WHIP Using	Plantain Acres	Production (CWT)	Value	Expected Compensation	Difference (NCT-Others)
NCT	8.19	1,421	$69,814	$41,749	0

[114] *See supra* note 116 and accompanying text.
[115] Rivera-Aquino, *supra* note 24, app. F.

UPR	9.71	1,979	$84,855	$50,743	-$8,994
PRDA	9.71	1,667	$73,811	$44,139	-$2,390

For a Highland Plantain Farmer, if the data from the UPR had been adopted by the NCT, $8,994.00 more would have been compensated for 10 "cuerdas" or 8,500 plants. On the other hand, if the data used had been that from the PRDA, $2,390.00 more would have been paid. Again, it is important to keep in mind that PRDA data neglects irrigation practices and plant density. In this case, this Highland plantain farmer could have received between $2,390 to $8,994 more in WHIP payments had data from the PRDA or the UPR been used, respectively.

Earlier it was stated that in 2018, there were 1,363 plantain farms in Puerto Rico, with 10,624 "cuerdas" (10,315 acres).[116] If the least amount on Table 2.2.3 is taken, $3,732.88 per acre, and multiplied by the total acres accounted tight after Hurricane Maria, $38,504,657.20 were not considered as part of the value for plantains. Assuming the NCT average price is accurate and applying the WHIP factor (0.65) and the Unharvest factor (0.92) to the approximation before made, $38,504,657.20 in plantain value not considered at all under WHIP, it yields to $23,025,785 that could have been additionally compensated to plantain farmers if the NCT had considered the values of the UPR.[117] This amount is likely to increase as irrigated plantain acres enter the equation.

Additionally, while comparing the 2017 NCT[118] with the Puerto Rico Notice CM-2[119], it was found that $4,911.67 were not considered for compensation under WHIP. This value multiplied times the acreage reported by NASS in 2018, 10,315, results in $50,663,876 not considered as part of the value of plantains. Again, if the 2017 NCT average price is accurate, applying the WHIP factor (0.65) and the Unharvest factor (0.92), it is likely that $30,296,997.90 in compensations did not reach Puerto Rico plantain farmers under WHIP.[120]

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[116] NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., *supra* note 7, at 19 tbl. 15.
[117] *Id.* Multiply the value per acre, $3,732.88, times total plantain acreage reported in 2018, times WHIP and UH factors.
[118] Rivera-Aquino, *supra* note 24, app. A, at 16.
[119] *Id.*; *see also* Rivera-Aquino, *supra* note 24, app. E, at 23.
[120] Multiply the value per acre, $4,911.67, times total plantain acreage reported in 2018, times WHIP and UH factors.

In most scenarios, there is a clear tendency: plantain farmers seem to have been under-compensated by WHIP. Since FSA's NCTs is also used for NAP and is likely to be used in future ad hoc emergency programs, if the data is not modified to correctly reflect the reality of the field, plantain farmers are likely to continue to be under-compensated, thus being adversely affected. Indirectly this has a broader effect in rural Puerto Rico, where plantain farms operate.

V. Legal Remedies Available to Plantain Farmers

FSA defines a "participant" as "any individual or entity who has applied for, or who's right to participate in or receive, a payment, loan, loan guarantee, or other benefit in accordance with any program of FSA to which the regulations in this part apply is affected by a decision of FSA."[121] An "adverse decision" is defined by the Agency as any denial of program participation, benefits, written agreements, or eligibility that results in a participant receiving fewer funds than the participant believes should have been paid, or not receiving a program benefit to which the participant believes the participant was entitled.[122] Both issuance of payments or other program benefits to a participant in a program and errors in documentation and calculations necessary to determine program eligibility are numbered as applicable for appeals.[123]

FSA offers various mechanisms to appeal, most prominently requesting mediation and reconsideration to their CoC's or StC. FSA's Appeal regulations are governed by 7 C.F.R. 780. Additionally, there is also the opportunity to raise the issue to USDA's National Appeals Division (NAD). The procedures within NAD are governed by 7 C.F.R. 11. In both forums, the farmer has the burden of proof and must demonstrate, by preponderance of the evidence, that the adverse decision made by the agency was in error.[124] Additionally, matters on time limitations and general applicability determination will come into play. Finally, there is a matter of funding availability.

A. Time Limitations

For reconsideration procedures, both at NAD and at FSA (CoC or StC), there is a time limitation in place. The federal code

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[121] 7 C.F.R. § 780.2 (2022). The term does not include individuals or entities whose claim arise under the programs excluded in the definition of participant published at 7 CFR 11.1 (2022).
[122] 7 C.F.R. § 780.2 (2022).
[123] FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., 1-APP (REV. 2), *Program Appeals, Mediation, and Ligtigation* ¶ 9 (2016) [Hereinafter 1-APP].
[124] 7 C.F.R. § 11.8(e) (2022).

prescribes time limitations for farmers who seek reconsideration within FSA. Reconsideration or appeal petitions must not exceed thirty (30) days from the date a participant receives written notice of the adverse decision;[125] written notice is usually considered to have been received seven (7) days after it was made.[126] As far as NAD goes, based on case interpretations, there is indicia that it applies a thirty-calendar-day jurisdictional limitation from the time the participant receives the adverse decision.[127] This thirty-day period applies to instances when the agency fails to act. [128] Failure to act is by itself an adverse decision.[129] The language utilized states that the clock begins to count "from the moment the participant knew" or "should have reasonably known" that the agency had not acted.[130] There are no clear references of what a "reasonable" timeframe would be.[131] This time limitation is there to bring finality to agency decisions.[132] Generally, to minimize confusion on the part of participants, FSA does not issue letters notifying participants of the opportunity to challenge, seek reconsideration, or appeal, favorable decisions.[133]

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[125] 7 C.F.R. § 780.15(c) (2022) ("A participant requesting reconsideration, mediation or appeal must submit a written request as instructed in the notice of decision that is received no later than 30 calendar days from the date a participant receives written notice of the decision. A participant that receives a determination made under part 1400 of this title will be deemed to have consented to an extension of the time limitation for a final determination as provided in part 1400 of this title if the participant requests mediation.").

[126] 7 C.F.R. § 780.15(e)(2) (2022) ("The date when an adverse decision or other notice pursuant to these rules is deemed received is the earlier of physical delivery by hand, by facsimile with electronic confirmation of receipt, actual stamped record of receipt on a transmitted document, or 7 calendar days following deposit for delivery by regular mail.").

[127] Karen R. Krub, *USDA's National Appeals Division Procedures and Practice*, NAT'L AGRIC. L. CTR., 21 (rev. 2019).

[128] 7 C.F.R. § 11.6(b) (2022) ("To obtain a hearing under § 11.8, a participant personally must request such hearing not later than 30 days after the date on which the participant first received notice of the adverse decision or after the date on which the participant receives notice of the Director's determination that a decision is appealable. In the case of the failure of an agency to act on the request or right of a recipient, a participant personally must request such hearing not later than 30 days after the participant knew or reasonably should have known that the agency had not acted within the timeframes specified by agency program regulations, or, where such regulations specify no timeframes, not later than 30 days after the participant reasonably should have known of the agency's failure to act."). (Emphasis Ours)

[129] 7 C.F.R. § 11.1 (2022) (defining adverse decision).

[130] 7 C.F.R. § 11.6(b) (2022).

[131] KRUB, *supra* note 132, at 10.

[132] National Appeals Division Rules of Procedure, 64 Fed. Reg. 33367-01, 33371 (June 23, 1999).

[133] 1-APP, *supra* note 127, ¶ 12. According to FSA, "[d]ecision letters should contain as much information as possible summarizing all pertinent information and program

So, what about a plantain farmer who received a payment, without knowing that an error was made by the agency? Most plantain farmers in Puerto Rico received their payments in 2019. Farmers that received some sort of compensation from FSA and did not learn of an error from just reading their payment statement or Agency Record calculations, if available, should be able to request a reconsideration or appeal, thirty (30) days from the moment they learned about the error in their payment calculation, even if several months, or years have elapsed since the payment determination. Pieces of information for this article were obtained only after a FOIA request was issued, thus, key information to assess errors in payment calculations was not readily available to plantain farmers when they received some form of payments. There is no indication that they should have known that errors in payment calculations when they received their payments.

B. Matters of General Applicability

Another jurisdictional matter arises on whether issues of general applicability are appealable. FSA regulation states that "[a]ny general program provision or program policy or any statutory or regulatory requirement that is applicable to similarly situated participants" or "[m]athematical formulas established under a statute or program regulation and decisions based solely on the application of those formulas," among other, are decisions that are not appealable.[134] NAD's Director has the authority to determine whether the issue presented is one of "general applicability" and thus not appealable.[135] Price setting and CEY adoption are often regarded by FSA as of "general applicability."[136] FSA has argued that, if an error occurs in the application of a matter of general applicability, that error affects all farmers and not just a particular farmer.

In relations to FSA's plantain NCT record over the years, many incongruencies arise: 1) having the same CEY between 2013

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provisions that could be relevant to the determination. A good decision letter: is a letter that adequately summarizes and explains everything that matters about a case[;] should require little additional information to explain what is really at issue in a case[; t]he decision letter is the starting point for the next administrative review authority." *Id.*

[134] 7 C.F.R. § 780.5(a)(1)-(2) (2022).

[135] Christopher R. Kelley, *The USDA National Appeals Division: An Outline of the Rules of Procedures*, NAT'L AGRIC. L. CTR., 4 (2003).

[136] *See* 1-APP, *supra* note 127, ¶ 9. Issues that do not result in individual determinations, but which may or may not impact individual applications, such as definitions of eligible crops, prices, average yields, factors, signup dates or deadlines, or other generally applicable matters not decided in response to any specific application, applicant, or participant.

and 2018; 2) the claimed source of information, PRDA, does not differentiate between yields based on irrigation practices; 3) the claimed source of information, PRDA, uses a different unit of measure pertaining production; 4) the trends of historic prices in the NCT do not resemble those from the claimed source of information, PRDA; 5) utilizing a conversion factor without reference to a scientific source to determine its accuracy; 6) sound data from the UPR show higher yields of plantain fruits per plant than the data from FSA; 7) references to UPR data from 1999 is still cited in the 2018 NCT, leading to believe that outdated sources are still being used; 8) yields for plantains from the P.R. Notice CM-2, p. 23 and the P.R. Notice WHIP-1, p.16, differ greatly; etc. FSA may claim that the PRDA has not been consistent in providing their Agricultural Gross Income report, seemingly after 2015. There is a major difference between the "best data," and the "best available data." Now, FSA has the responsibility of properly maintaining NCT data, not the PRDA, including documenting how decisions are made.[137]

Whether these incongruencies are sufficient to prove that FSA erred, by preponderance of the evidence, must consider the level of deference NAD may yield FSA. In NAD case number 2008E000455, under National Director review, it was determined that aspects such as "average market prices and the unharvested factors are appealable," contrary to what the Hearing Officer had previously determined,[138] as it "directly affects the amount of the payments Appellant is eligible to receive." Nonetheless, minor deviations and use of different sources of data do not amount to error.[139]

Recently, an NAD Case[140] considered the issue of "agency deference." On it, a reference to a "Kisor" test, adopted by the Supreme Court in 2019, is made. In the referred "Kisor" case, it is summarized that the "deference doctrine" is applied in interpretative

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[137] 1-NAP, *supra* note 23, ¶ 276(C).

[138] Director Review Determination, NAD Case No. 2008E000455 (U.S. Dep't of Agric. Oct. 22, 2008). The case goes on to say "FSA erred in calculating the average market price and the payment factors under its regulations that it then generally applied. Resolution of the issues Appellant raises in this case, i.e., the proper price and unharvested factors of his 2007 NAP crops, directly affects the amount of payments Appellant is eligible to receive." *Id.*

[139] Director Review Determination, NAD Case No. 2016W000294 (U.S. Dep't of Agric. July 7, 2017) ("Each year, FSA conducts a nationwide review to ascertain the basis of stark payment differences between counties... FSA also corrects mathematical errors, adjusts state committee established yields when RMA data becomes available, and adjusts RMA yields when NASS data becomes available.").

[140] Director Review Determination, NAD Case No. 2021S000076 (U.S. Dep't of Agric. Jan. 25, 2022).

questions related to an agency's own ambiguous rules.[141] "The subject matter of a rule 'may be so specialized and varying in nature as to be impossible'—or at any rate, impracticable—to capture in its every detail."[142] In these cases, courts limit themselves and allow agencies to construct "its own regulation."[143] But such deference should not be afforded to agencies "unless the regulation is genuinely ambiguous,"[144] and the agencies reading must be reasonable[145] if the "agency interpretation entitles it to its own weight"[146] and "implicate its substantive expertise."[147] Finally, an "agency's reading must reflect a fair and considered judgement" to receive deference.[148]

To FSA, it may seem clear that plantain price setting and plantain CEY adoption, being applied in general to all plantain producers, even if in error, are not subject to appeal. Yet some ambiguity has been raised, once the issue of general applicability seemingly in error, is applied to a payment of a participant. It seems that this ambiguity, at least by NAD's standards, is not the sort that usher's deference. From the "Kisor" test, FSA's interpretation seems to fail both at the reasonableness and fairness elements as it would be unjust to allow an error generally applied, that affects an individual participant, not to be appealed.[149] To pinpoint errors in price setting and plantain CEY adoption, it may be necessary to issue a subpoena requiring the production of evidence and the attendance of witnesses, following 7 C.F.R. 11.8, to reverse engineer the confection of the plantain 2017 NCT.

C. Funding Availability

Lack of funding is another element to be considered outside the scope of the informal appeals process.[150] Most of the time, agencies need not to spend their funding by the end of the fiscal year, but rather obligate its use; actual spending, in most cases, must be spent under the "five-year" rule. This rule states that funds obligated

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[141] Kisor v. Wilkie, 139 S. Ct. 2400, 2408 (2019).
[142] *Id.* at 2408.
[143] *Id.* at 2411.
[144] *Id.* at 2415.
[145] *Id.*
[146] *Id.* at 2416.
[147] *Id.* at 2417.
[148] *Id.*
[149] See generally, Director Review Determination, NAD Case No. 2004W000899 (U.S. Dep't of Agric. Jan. 13, 2005).
[150] 1-APP, *supra* note 127, ¶ 9.

by the end of a fiscal year must be expended within five fiscal years from the last day it could have been obligated.[151]

Whether the funding for WHIP has been depleted, is outside the scope of this analysis. But this could well be an argument presented by FSA that may limit reconsiderations or appeals. Nonetheless, an OIG report on WHIP performed in 2020, studied the breadth of improper payments and in the cases underpaid producers, the OIG recommends that a payment be issued.[152] Still, OIG's report on WHIP did not cover Puerto Rico; it only covered Gorgia and Florida.

VI. Conclusions and Recommendations

FSA will utilize the best data available to them. If the Agency, nor the plantain farmers, do not make their best effort to have the most suitable sources of information on plantain production possible on a yearly basis, the best data available could well be obsolete data. CoC and StC members need to get more involved with NCT determinations, and periodically enter in communications with the UPR and the PRDA to request updated information. The information shared here shows the possibility that several sources of information were utilized and extrapolated to build NCT values, that do not reflect the reality of plantain farms today. There are references in the 2018 NCT dating back to 1999. The county expected yields are founded on values that do not resemble UPR data. A much deeper look is needed to figure out how exactly the NCT values for plantain have come into being over the years in FSA-Puerto Rico. This in-depth look may well occur in an appeals process. Had FSA used more current crop values in 2017 and the preceding years for plantain, such as the ones used by the UPR to prepare its plantain model budget, the NCT's average yield and average prices would have been higher and an additional $8,035/acre in the semiarid zone with irrigation, or $3,732.88/acre in the Highlands without irrigation should have been part of the values considered in the compensation calculation for these farmers. If the values within the NCT are not corrected, in future events that may affect plantain producers, they are likely to receive, once again, a reduced compensation.

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[151] The term "five-year rule" is borrowed from the course, Farm Policy, and the Federal Budget, at the LLM Program of the University of Arkansas. As reference material, see U.S. GOV'T ACCOUNTABILITY OFF., GAO-16-464SP, PRINCIPLES OF FEDERAL APPROPRIATIONS LAW 2-29 (4th ed. 2016).

[152] OFF. OF INSPECTOR GEN., U.S. DEP'T OF AGRIC., AUDIT REPORT NO. 03702-0002-31, WILDFIRES AND HURRICANES INDEMNITY PROGRAMS 8 (2020).

Here are some recommendations for farmer organizations, the Agency and other agricultural support structures such as the UPR and the PRDA, to prevent reduced compensation in future climatic events that may affect plantain producers in Puerto Rico:

First – Adjust planting densities for the counties that predominantly cover the Highland or Coastal zones in such a way that they fairly represent the reality of the practices carried out by farmers, who often adopt UPR's recommendations. Knowing that the FSA is divided into Field Offices (counties) that can reasonably be representative of Highlands or Coastal zones, it would be more than reasonable to modify expected yields as such instead of having a blanket yield across all counties.

Second – Propose to FSA, PRDA and NASS methods that estimate more accurately the number of plantains produced per plant and per acre. This is particularly critical for farmers in the semiarid zones, who use irrigation, and undoubtedly obtain higher volumes of production if compared to humid zones.

Third – Request the Division of Agricultural Statistics of the Puerto Rico Department of Agriculture (PRDA), to officially publish, with logo and signature of the person in charge, the reports of Gross Agricultural Income at a certain and known date, every year. This way, accurate data will be available to make just compensations in the event of future events. If this piece of information is ever to be introduced as evidence in any administrative procedure, it will be recognized as an officially publicized document. In addition, they must publish data on land use, with irrigation and without irrigation, by product, to estimate more precisely the average production by type of practice.

Fourth - Request FSA to use the same units to estimate production and product yields as captured by PRDA and NASS. For example, in the case of plantains it is recommended to use thousands of fruits, as it is the commonly accepted unit of measure, instead of using hundredweight.

Fifth - Request FSA to publish annually the minutes of the meetings in which the data to contained in the "NCT" for plantains is adopted, to verify correctness.

Sixth – Request that FSA and CSA share data, to ensure that any deductions on insurance payments are for the appropriate item, be it plantation (plants) or harvest (yield).

Seventh – Congregate UPR, FSA and PRDA to work together to achieve more uniform statistical analysis and recordkeeping pertaining plantains, considering the information required by the NCT.

Eighth – Recommend Congress that in future *Ad Hoc* disaster loss compensation programs, Puerto Rico farmers be allowed to use their historic records when submitted, as in the rest of the U.S.

Ninth – Petition PRDA and NASS to dissect their plantain data based on irrigation practices.

Tenth – Strengthen farmer participation in County Committees (CoC) and State Committees, allowing them to truly become an independent voice from FSA's administrative structure, to better serve their farming communities, through knowledge on procedures and agronomic data. Delegation of CoC functions to FSA's employees must be limited and CoC meetings must be held frequently.

When Federal or State governments issue agricultural disaster assistance programs, the goal is to help speed the recovery of American farmers who satisfy the nutritional security of the American people. This is also a way to revamp the rural economy where most farms operate. To achieve the goals intended, suitable procedure must be followed adequately. The objective of this paper is to raise awareness within FSA and other agricultural related agencies on the importance of maintaining an adequate data bases; farmers need to get more involved in the decision making within FSA. It is likely that climatic events will affect plantain farmers in the future. Unlike playing dice, which gives different results by doing the same action, if changes are not made to the NCT plantain data in Puerto Rico, the same result will occur over and over: less than fair compensation for losses experienced after natural disasters, perpetuating the condition of being socially disadvantaged farmers.