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PHILIPPINES

Is the fun drying up? Implications of intensifying El Niño conditions for drought risk and food security

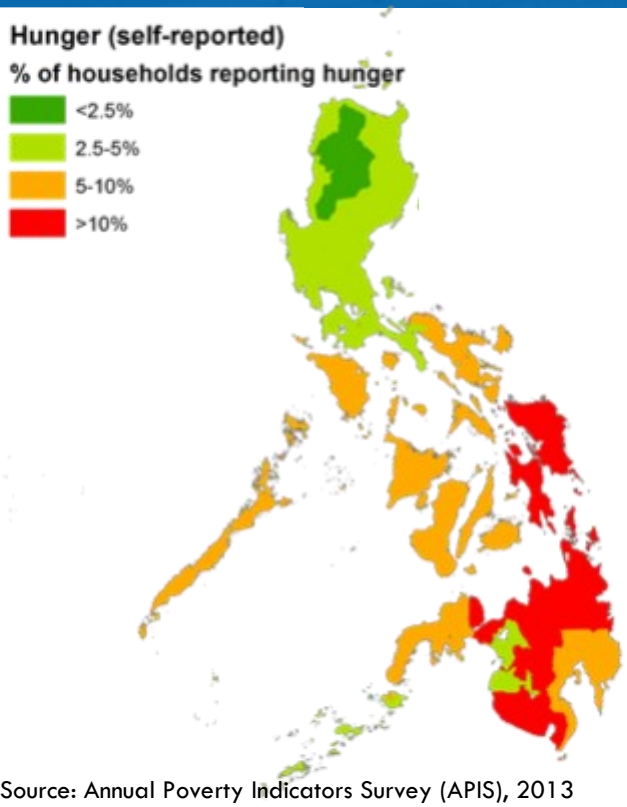
2016

CONTENTS

KEY MESSAGES

- The Philippines is highly vulnerable to climate risks including typhoons, floods and drought. Addressing and adapting to these risks is essential for achieving zero hunger.
- The Philippines is traditionally associated with typhoon impact. However, the El Niño phenomenon can be equally destructive: the climate cycle is associated with lower rainfall between December and February which can have severe effects on the second cropping cycle and can deplete water resources for the main cropping cycle.
- Between 2015 and 2016, the strongest El Niño event ever recorded formed, affecting several countries in Asia—including the Philippines.
- As of early 2016, over 85 percent of the territory was considered to be affected by the dry conditions brought about by El Niño, with Mindanao being the most affected.
- An emergency food security assessment carried out in March 2016 indicated that, in some of the most affected provinces of Mindanao, over 70 percent of farmers have reported negative impact on crops, with resulting food security consequences, and over 60 percent of households have resorted to extreme forms of coping such as selling productive assets.
- Addressing the recurring risks associated with El Niño will require investments in early warning and preparedness, adaptation strategies and risk management techniques ensuring support to the most vulnerable.

2016 Food & Nutrition Security Profile



Source: Annual Poverty Indicators Survey (APIS), 2013

Overall, 6.3 percent of households report to experience hunger, but this number is much higher in the regions of the Eastern Visayas (16.2 percent), Davao (13 percent), Soccsksargen (11.7 percent), and Zamboanga (10.1 percent).

Experiencing hunger is more common in adults than children and can lead to skipping meals and not eating for a whole day. At least half of all households reduce the quantity of meals once a year, with 43 percent of adults reporting that they have gone several days without eating.

Key trends

- In the past decade, impressive gains have been made in poverty reduction; however since 2009, poverty incidence has declined only moderately between 2009 and 2012 (from 26.3 to 25.2 percent), but the magnitude of poverty has increased in the same period (from 3.81 million people to 4.21 million people).
- Employment is unstable. In 2013, around 2.8 million people were unemployed and 10.8 million underemployed. Over 28 million Filipinos are informally employed and have little or no protection from job losses.
- Remittances remain significant, contributing US$27 billion to the Philippine economy (approximately 10 percent of the gross domestic product).
- Nutrition concerns are still largely unaddressed. Since 2005, nutrition indicators for children under the age of 5 have shown marginal improvement or even deterioration: prevalence of underweight has increased from 20. percent (2005) to 21.5 percent (21.15) stunting rates have increased from 32.9 percent to 33.4 percent in the same period.
- Wasting has increased between 2005 and 2015 from 5.8 to 7.1 percent. The highest wasting rates are found in parts of the MIMAROPA, Eastern Visayas and ARMM.

Availability

The Government of the Philippines aims for rice self-sufficiency. Currently, the country does not produce sufficient food to satisfy caloric demands. The Government has imported millions of metric tons of rice (between 200,000 and 660,000 in average years, and up to 2.5 million metric tons in years with particularly low production). The average Filipino consumes 1,957 kcal—below the international recommendation of 2,200kcal (for women) and 2,600kcal (for men).

Access

Access to sufficient and nutritious food is limited by poverty and income levels. This is particularly the case in the Eastern and Southern parts of the archipelago.

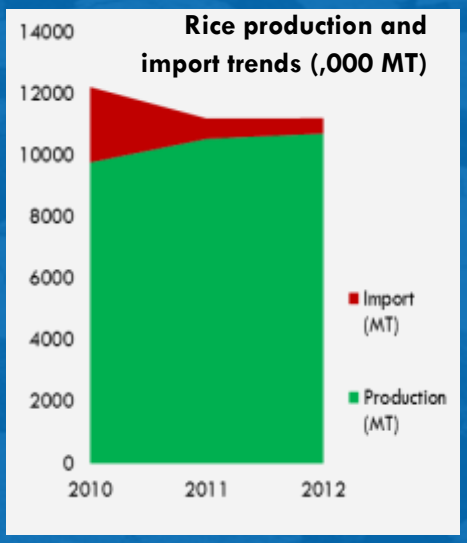
Low incomes can also result in households spending more of their income on food. Households that spend over 65 percent of their income on food can be considered to be highly vulnerable to price shocks. Overall, ARMM has the highest proportion of families spending >65 percent of their income on food, followed by Zamboanga, Caraga, Bicol, Soccsksargen and Eastern Visayas.

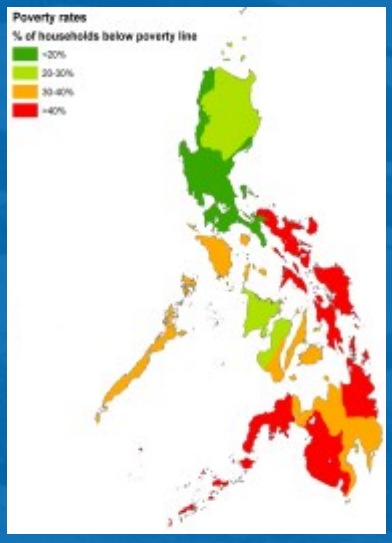
Utilization

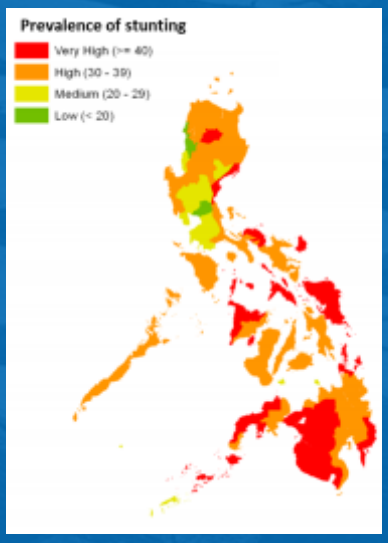
Nutrition continues to be challenge across most of the country, especially on undernutrition (wasting and stunting).

The magnitude and severity of underweight prevalence were found to be very high in 9 of the 17 regions: primarily in the MIMAROPA, Eastern Visayas, Bicol, Western Visayas and Soccsksargen.

Chronic malnutrition (stunting) is considered to be very high in the ARMM, Eastern Visayas, Mimaropa, Bicol and Soccsksargen at 40% and above. Acute malnutrition (wasting) is also highest in Mimaropa, Eastern Visayas, ARMM, Bicol and Caraga regions.







Vulnerability: Emerging Issues

El Niño

The latter half of 2015, the warmest year on record, has been marked by a strong El Niño cycle. The phenomenon has been linked with lower rainfall in several regions of the world, including reductions of 20-30 percent in Indonesia and 15 percent in India. The Philippines has also been affected with several provinces receiving below-average rainfall until April 2016.

01 El Niño and Historical Drought Risk

Rainfall is influenced by El Niño Southern Oscillation (ENSO)—one of the key climate drivers in the region with a recurrence cycle of two to seven years. Years with a strong El Niño cycle are associated with lower rainfall overall especially between December and February, while years with a strong La Niña signal are associated with large increases in rainfall between October and December in the central eastern parts of the country.

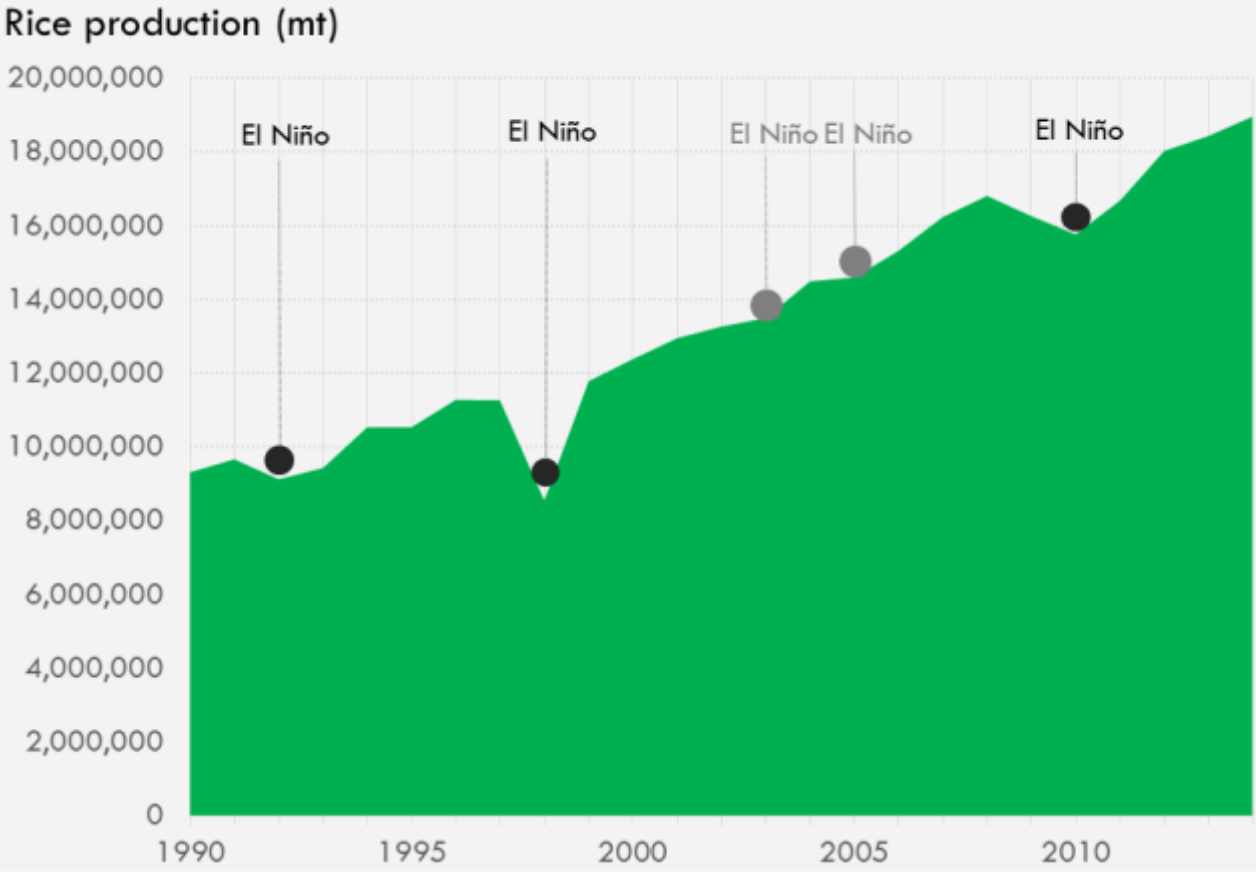
Over the 20th century, the Philippines has experienced a number of serious droughts linked to the El Niño that have had major implications for food security. Historically, El Niño-induced droughts have resulted in severe agricultural losses of over 6 percent with key crops such as rice and coconut being particularly affected. Under climate change, increased warming and more erratic rainfall patterns could exacerbate drought risk, particularly if combined with a delay in the onset of rains.

Historically droughts have had severe economic consequences on the economy of the Philippines, with the rural sector – which accounts for 11 percent of GDP – being particularly vulnerable. The El Niño droughts of 1997/1998 resulted in losses of up to 5 billion PHP from farm production and a 6.4 percent contraction in agriculture was the main reason why gross domestic product shrank that year. In the absence of enhanced drought risk management measures there is concern that El Niño would continue to affect agricultural production and gross domestic product.

Despite impressive technological improvements in the agricultural sector, agriculture remains highly climate sensitive. Through rice production has been increasing steadily since the 1990s years with either moderate or strong El Niño events have been associated with major crop losses resulting from lower availability of water. The most severe impacts occurred in 1997/1998 when the strongest El Niño episode on record formed. Another El Niño episode in 2009/2010 contributed to a major decline in rice production. The El Niño cycle has therefore been closely interlinked with rice production trends, and in the absence of sufficient risk management a strong El Niño episode in 2015/2016 can therefore have severe implications for food security.

In years with dry conditions, losses in rice production are buffered through increases in production of other drought-tolerant crops such as vegetables but lack of familiarity with some of these crops results in lower yields.

EL NIÑO: CONSEQUENCES FOR RICE PRODUCTION



Source: Philippine Statistics Authority

Historically moderate and strong El Niño events have been linked to significant decreases in agricultural production (1982/1983, 1986/1987, 1996/1997, 2002/2003 and 2004/2005) with concerns that a continuation of dry conditions may affect rice production in the 2015/2016 harvests. However, harvests until December 2015 have surpassed production in 2014 due to good rains in the June to October monsoon. Whether the effects of the El Niño cycle will affect production in 2016 is a key issue.

02 Drought Forecast for 2016

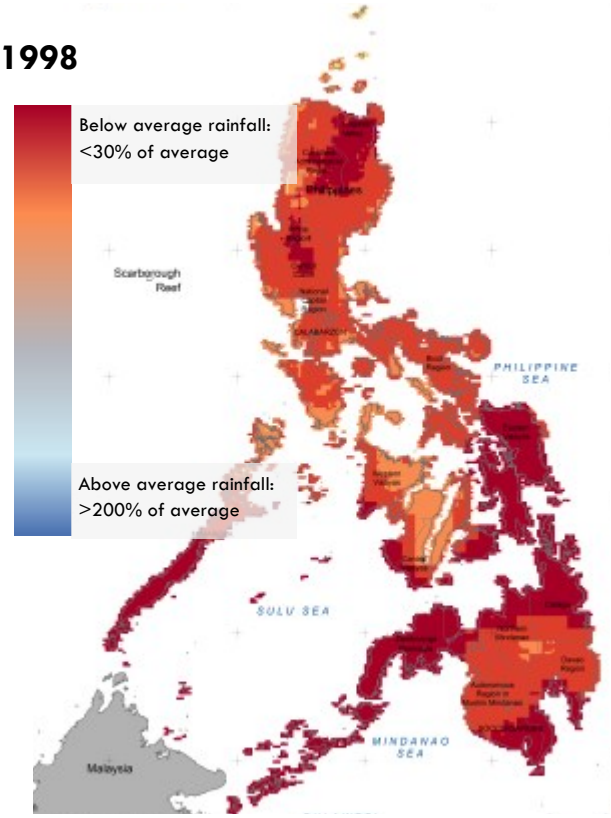
Drought is defined by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) as three consecutive months of 60 percent reduction in rainfall, while a dry spell is defined as three consecutive months of 21- 60 percent reduction in rainfall.

El Niño conditions have been forming since April 2015 as sea surface temperatures increased in the Pacific Ocean. Forecasts suggest that these conditions will likely continue until the first half of 2016, weakening thereafter. Scientists have warned that the 2015/2016 episode is likely to be the most intense on record.

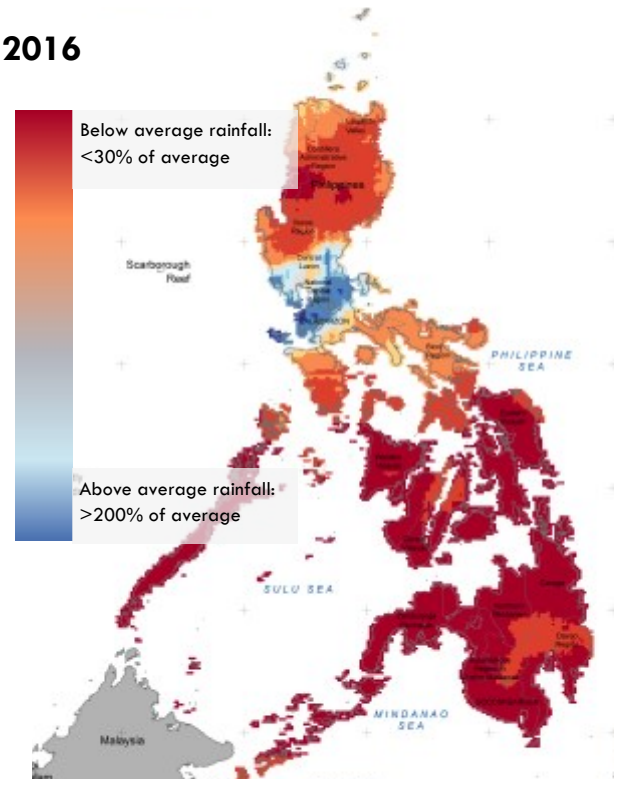
At the end of 2015, forty-five provinces (60 percent of the country's territory) were declared to be heavily affected by dry spell or drought. By February 2016 up to 85 percent of the country was considered to be affected. For comparative purposes, the 1997/1998 episode, the strongest to date, affected over 70 percent of the territory.

Of key concern is the potential impact of dry conditions on the second rice crop, which is usually sown in October and harvested between January and April. Dry conditions in the initial stages of sowing affect soil quality and availability of water, while a continuation of dryness during the growing stages seriously affects overall production. This is especially significant in Mindanao and northern Luzon where the second season rice crop is an important contributor to food security.

1998

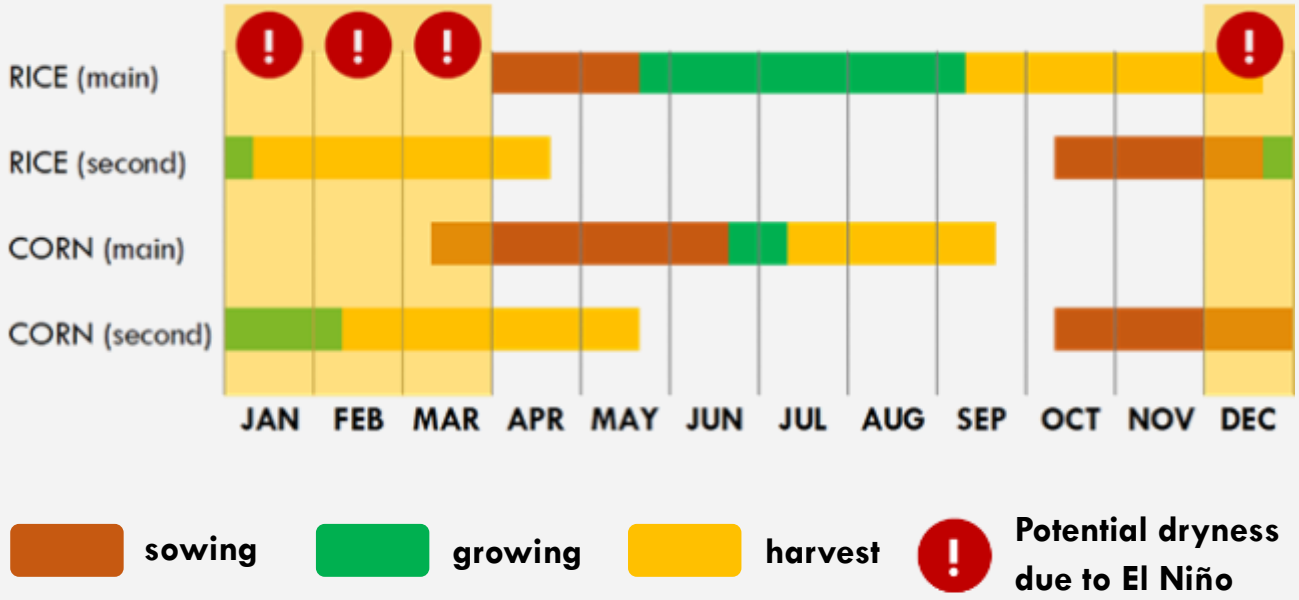


2016



Comparison of rainfall anomalies in 1998 and 2016, two of the strongest El Nino episodes recorded.

CROP CALENDAR | PHILIPPINES



Source: FAO (crop calendar) and NOAA (drought risk months)

As a result of below-average rainfall conditions throughout the Philippines, some areas have experienced severe water shortages which would affect agricultural production. Projections indicate an improvement of rainfall conditions with a return to normal rainfall towards the second half of 2016.

However, a perturbation of the hydrological cycle during the monsoon could exacerbate the risk of drought or dry spells in the rainy season (June to October). This is significant as, for rainfed rice farming it is the timing of rains, rather than the overall rainfall, which determines production.

The main rice harvest occurs following the rainy season which contributes water to both rainfed and irrigated rice systems. A second harvest occurs in some areas between January and April/May. The most direct impact of dry conditions associated with El Niño would have be on the second crop. A continuation of these conditions until the rainy season would severely compromise rice and corn production for the main harvest in 2016 through impacts on soil quality, and availability of ground and surface water.

03 Potential Impacts

An evaluation of the impacts of the 1997/1998 El Niño event can shed light on the potential effects of the current weather episode. Rice has an extremely high water requirement and is extremely sensitive to changes in water conditions; anomalously dry conditions can reduce yields. Following the 1997/1998 drought, over 5 billion PHP of agricultural production was lost. Rice and maize, the main crops, were especially affected with a production reduction of over 30 percent (rainfed rice), 20 percent (irrigated rice), and 10 percent (maize and coconut) compared to the same season in the previous year. Impacts associated with the El Niño Southern Oscillation cycle are summarised below.

Actual impacts are impossible to forecast as no two El Niño events are the same. Impacts depend on a number of factors including how temperatures change over the December-February timeframe and the preparedness measures taken by communities. Adoption of drought-resistant crop varieties, for instance, can help reduce losses.

Several adaptation measures have already been taken by the Government of the Philippines and communities to reduce the potential effects of the drought including introduction of water harvesting technologies and vegetables instead of rice. However, some losses are still likely.

EL NIÑO

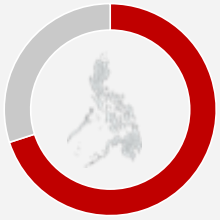
climatic conditions	**higher temperature**	lower temperature	higher rainfall	**lower rainfall**
extreme weather	**drought risk**	flood risk	typhoon risk	
food security impact	drought-like conditions in key crop growth periods leads to **lower production** and **lower stocks**			

LA NIÑA

climatic conditions	higher temperature	**lower temperature**	**higher rainfall**	lower rainfall
extreme weather	drought risk	**flood risk**	**typhoon risk**	
food security impact	more extreme weather events in the latter half of the year can result in **disruption to livelihood activities**; damage to key infrastructure (roads) may also affect **market access**			

IMPACTS OF THE 1997/98 EL NIÑO-INDUCED DROUGHT

PROPORTION OF LAND AFFECTED



70% of the country was affected

ECONOMIC LOSSES
(compared to previous year)

rice and corn production losses
equivalent to **3 billion pesos**

TOTAL AGRICULTURAL LOSSES
(compared to previous year)

6.4% of agricultural production contracted

RAINFED RICE LOSSES
(compared to previous year)

32.4% of agricultural production contracted

IRRIGATED RICE LOSSES
(compared to previous year)

21.2% of agricultural production contracted

CORN LOSSES
(compared to previous year)

11.7% of agricultural production contracted

COCONUT LOSSES
(compared to previous year)

11.9% of agricultural production contracted

Source: PSA

To better understand the potential implications of an intense El Nino cycle and the potential drought in 2015/2016 it is useful to evaluate losses incurred in 1997/1998 when a similar event took place. Agricultural losses were significant, with over 620,000 metric tonnes of rice and 565,000 metric tonnes of corn lost compared to production in 1996/1997. The reduced availability of key staples had severe implications for food security, especially among the poorest populations who depend on rainfed agriculture for their food and livelihoods.

04 Drought under Climate Change

Under El Niño conditions, there are significant reductions in rainfall in large parts of country, particularly in the southern and western parts of the country: Mindanao, the Central Visayas, and Palawan.

A key concern under a climate change scenario is that warmer sea surface temperatures may result in more frequent and stronger El Niño periods. More powerful episodes could result in longer and more intense reductions in rainfall. This trend, together with potentially more intense typhoons could have devastating consequences for agricultural production and food security in general.

In addition to El Niño, two key trends under climate change, the Philippines will likely interact with each other and exacerbate drought risk:

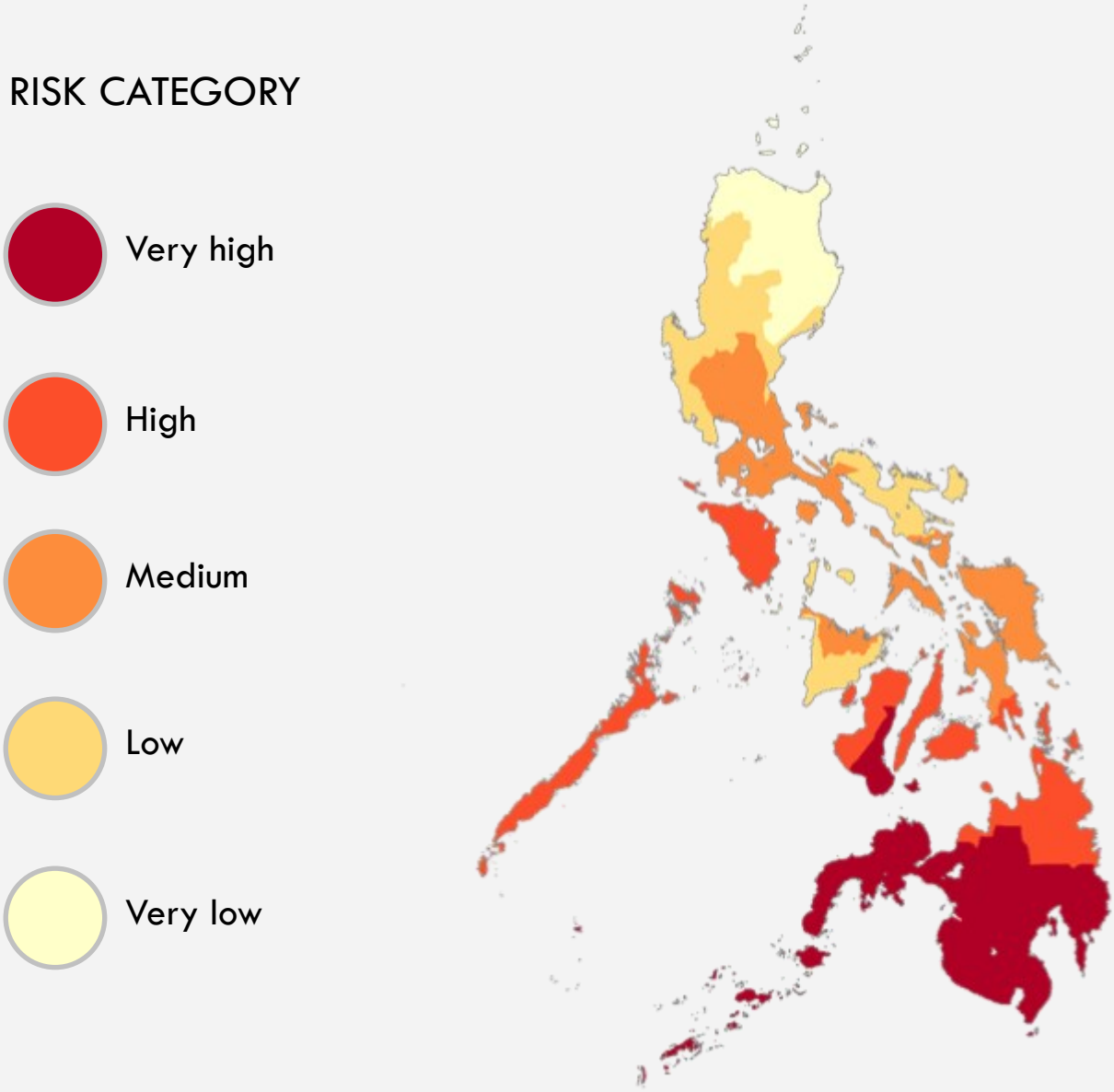
- **Warmer temperatures**, especially in the summer months, exacerbating the risk of drought in the months leading to the monsoon rains. The highest temperatures are projected in the southern parts of the country.
- **Increasingly variable rainfall**, with lower rainfall in the dry period (March-May) and higher rainfall in the wet seasons (June – August and September-November). This scenario would lead to higher drought risk in the dry period, and higher flood risk in the wet season.

The combination of higher temperatures and variable rainfall patterns, especially in the southern parts of the country can have serious effects on food security. According to the index of agriculture and fishery statistics, these regions are predominantly agricultural, producing a significant amount of staple and cash crops, including rice, bananas, coconuts and pineapple. Drought conditions could reduce productivity of these crops with widespread economic losses and food security consequences.

Addressing these challenges will require better early warning and preparedness measures combined with effective adaptation that supports the poorest and most vulnerable communities as well as mechanisms to manage unavoidable losses and damage.

The Food Security Climate Resilience (FoodSECuRE) Facility is a multilateral, multi-year, replenishable fund being developed by WFP to financially and programmatically support community-centred action to reinforce and build climate resilience. This ground breaking instrument specifically links climate and hazard forecasting with flexible multi-year financing, providing governments the means to quickly unlock funding to scale-up food and nutrition responses as well as disaster risk reduction activities before climate disasters occur. FoodSECuRE will: i) trigger action based on climate forecasts, to reinforce community resilience **before shocks occur;** ii) complement **early response** , and iii) provide multi-year financing to deliver **resilience-building** activities during **post-disaster recovery** operations. The Philippines is one of the pilot countries for this initiative.

AREAS AT RISK OF RAINFALL REDUCTIONS DUE TO EL NIÑO



Source: IPCC, Philippine Observatory

At least three quarters of the territory of the Philippines is considered to be at medium or higher risk of reduced rainfall under El Niño conditions. The highest risks are in Mindanao, followed by the Central Visayas and Palawan. These are areas where peak rice harvesting occurs between December and February; here yields may be affected by high temperatures and lower rainfall during the end of the growing season. Under climate change, the southern and western parts of the country are also expected to experience some of the highest increases in temperature thereby increasing crop water requirements and exacerbating drought risk even further.

05 Food Security Impact

The causal links between drought risk and food security are complex and are linked to a number of phenomena: water scarcity, salinization of agricultural lands, destruction of crops, and increased incidence of pests and diseases.

The most direct impact of drought is through reduced agricultural output as a result of lower water availability. A range of crops are likely to be affected by a drought event. Rice, which has high water requirements, would be severely affected in the absence of mitigation measures. Other key crops such as maize, tobacco and high value commercial crops may also be affected. The reduced availability of corn may also affect the prices of animal feeds – of which corn is a key component.

An emergency food security assessment conducted in March 2016 in Lanao del Sur and Maguindanao – some of the most affected provinces – revealed high food security impact. In these areas, the majority of households depend on maize or paddy farming for their livelihoods. Production of these two key staple crops was severely disrupted by the limited rains and erratic rainfall during the November – April season with the average household losses reported to be 1,600MT compared to the production last year.

However, this is only part of the story: impacts on incomes and affordability of food, livelihoods, as well as on nutrition and dietary diversity are equally severe – especially for the poorest and most vulnerable communities.

The cost of crop damage is significant at the national level. But for the most vulnerable communities who rely almost exclusively on rainfed agriculture for their income the economic loss represents a significant reduction of income to purchase other food items, and further burdens their limited purchasing power. The loss of livelihoods resulting from drought can also have long-lasting consequences.

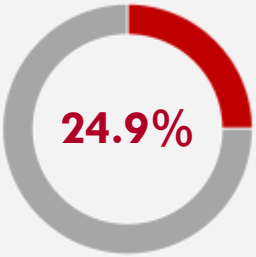
Drought diminishes dietary diversity and reduces overall food consumption. According to the WFP emergency food security assessment, the paddy and maize production deficit has translated into food shortages. Approximately one quarter of households reported poor food consumption, with food consumption being particularly poor among households who depend on agricultural daily labour or paddy farming.

Households have resorted to coping mechanisms such as eating cheaper and less preferred food items, limiting meal portions, and reducing the number of meals. Almost half of all households reported adoption of more severe forms of livelihood coping including selling productive livestock, which may have severe consequences for income and livelihood stability.

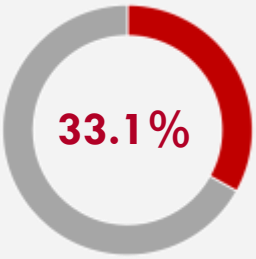
A survey conducted in March 2016 found severe impacts on food security in Mindanao

Approximately one quarter of households report inadequate food consumption as a result o the drought conditions in parts of Mindanao

PERCENT OF HOUSEHOLDS WITH INADEQUATE FOOD CONSUMPTION



PERCENT OF HOUSEHOLDS EATING FEWER THAN 3 MEALS PER DAY



WHO ARE THE MOST AFFECTED?

The majority of households depend on maize (43 percent) or paddy (28 percent) farming, which is mostly rainfed.

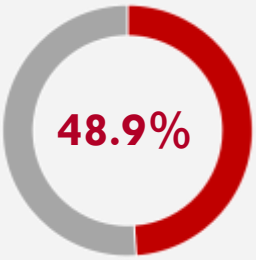
Paddy farmers were more severely affected by the drought. Paddy has higher water requirements.

As a result of the drought, households report losses of around 1,647 MT compared to the same period last year which will severely affect income levels and overall production for own consumption.

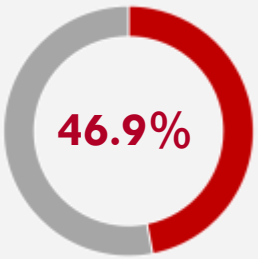
Over 60 percent of paddy farming households reported using emergency coping strategies to address drought impact.

Food consumption is lower among paddy farming households compared to other livelihood groups due to crop and income losses incurred. Women and children are nutritionally at risk.

PERCENT OF HOUSEHOLDS ADOPTING EMERGENCY COPING STRATEGIES



PERCENT OF HOUSEHOLDS SPENDING >75% OF INCOME ON FOOD



Source: WFP Emergency Food Security Assessment (2016)

Philippines: Major droughts, 1968-2000

Historically, a major drought has affected the Philippines every three to five years with the worst impacts linked to strong El Niño cycles. Impact on agricultural production and consequently on food security has been significant.

YEAR	AREAS AFFECTED	AGRICULTURAL DAMAGES
1968-1969	Most of the country, Bicol region especially affected	500,000 mt of rice and corn lost
1972-1973*	Central Luzon, Palawan, Visayas, and Mindanao	630,000 mt of rice and corn lost
1977-1978	Mindanao	750,000 mt of rice and corn lost
1982-1983*	Luzon, Northern Visayas, Bohol, and Western Mindanao	640,0000 mt of rice and corn lost
1986-1987	Bicol, Negros, Central Visayas, Western Mindanao	Agricultural damages of 47 million PHP
1989-1990	Cagayan, Panay, Guimaras, Palawan, Southern Mindanao	500,000 mt of rice and corn lost
1991-1992	Manila, Central and Western Visayas, Cagayan	460,000 ha of agricultural land affected; 4 billion PHP of agricultural damage
1997-1998*	About 70% of the country experienced severe drought	300,000 ha of rice and corn severely damaged; 620,000 mt of rice lost and 560,000 mt of corn lost; economic losses estimated at 3 billion PHP

Source: PSA. Years with a strong or very strong El Niño episode are highlighted with an asterisk (*)

Background image: Greenpeace Philippines

DROUGHT RISK MANAGEMENT

Recommended actions

Drought risk is a key challenge toward achieving zero hunger. To address this growing problem, the following actions are recommended:

Support the most vulnerable

Vulnerable communities who depend exclusively on rainfed agriculture are among those that will be most affected by drought. Introduction of risk management approaches such as integrated water management systems or irrigation infrastructure can help reduce the impact of drought on the most vulnerable.

Invest in early warning and preparedness

The Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) provides monthly outlooks with warnings of potential drought and dryspell risk through the country. These efforts should be promoted and enhanced as new technologies become available. Besides the disaster management community in the Philippines should mainstream the use of these bulletins to guide preparedness efforts. Moreover, adequate resources should be committed to develop community-level early warning systems and to strengthen the information preparedness for neighborhoods at the frontline of natural disasters.

Invest in adaptation

Early warning and preparedness are only one part of the solution. Drought risk management and adaptation efforts based on comprehensive climate analysis need to be integrated into agricultural and development strategies to support the poorest and most vulnerable communities—which are also the most affected by drought risk. Such measures may include livelihood diversification, introduction of drought-tolerant crops, and enhancing irrigation systems. A strong community ownership of adaptation measures is the key solution to address the challenge sustainably.

Invest in risk management and risk transfer

In some cases, preparedness and adaptation will not be sufficient because adaptation measures are either too expensive or unfeasible. In these cases, it will be important to scale up capacity to respond to disasters, support early recovery, and transfer risks through disaster risk financing and insurance. To design and implement programs and initiatives that align with the strategic plans and policy framework of national government will help enhance the effectiveness and robustness of risk transfer mechanisms.

STATISTICAL PROFILE

A Profile of Food Security

			Food consumption		
			1	2	3
			Food energy available	Diet quality	Hunger
			Energy consumed per capita (kcal)	Share of energy derived from staples (%)	Percent of households who experienced hunger (self-rated)
	1	Philippines	1957	62	6.3
	2	Rural	1828		
	3	Urban	2086		
Geography	4	National Capital Region	2160		2.7
	5	Cordillera Administrative Region	1701		0.3
	6	Region I- Ilocos Region	1849		2.8
	7	Region II - Cagayan Valley	1723		3.5
	8	Region III - Central Luzon	1953		4.2
	9	Region IVA - Calabarzon	2228		3.8
	10	Region IVB - Mimaropa	1808		5.8
	11	Region V - Bicol	1861		9.5
	12	Region VI - Western Visayas	1887		6.6
	13	Region VII - Central Visayas	1813		8.1
	14	Region VIII - Eastern Visayas	1804		16.2
	15	Region IX - Zamboanga Peninsula	1984		9.3
	16	Region X - Northern Mindanao	1885		10.1
	17	Region XI - Davao	1909		6.4
	18	Region XII - Soccsksargen	1942		13
	19	Region XIII - Caraga	1895		11.7
	20	Autonomous Region in Muslim Mindanao	1879		4.9
Gender	21	Male headed households	1944		
	22	Female headed households	2014		

Source: Department of Social Welfare (2015) ;

Food and Nutrition Research Institute (2013)

Economic vulnerability					Nutrition		
4			5		6	7	8
Poverty (2012)	Share of total poor population (%)	Share of expenditure on food (%)	Number of 4Ps households	Share of 4Ps households (%)	Stunting rates	Wasting rates	Underweight
22.3	100.0	42.8	3,938,964	100.0	30.3	7.9	19.9
		47 (2009 est.)					
		55 (2009 est.)					
3.8	1.9	36.5	212,309	5.4	22.4	6.4	12.9
22.6	1.6	40.8	61,482	1.6	32.4	5.9	16.5
16.7	3.7	45.3	189,677	4.8	27.4	9.8	21.4
19.8	3.7	49.4	96,242	2.4	26.9	7.9	20.6
12.2	5.6	43.7	262,117	6.7	23.1	8.3	17.7
11.2	6.0	40.6	292,975	7.4	25.3	8.7	18.1
28.4	3.7	46.4	174,795	4.4	35.6	9.8	27.5
34.1	9.6	49.0	361,190	9.2	39.8	7.4	24.6
24.7	8.8	44.4	299,986	7.6	36.9	8.9	26.0
28.8	8.8	44.5	249,401	6.3	34.6	7.9	23.1
37.2	7.9	45.8	256,285	6.5	36.8	7.8	21.7
36.9	5.9	49.0	272,412	6.9	38.7	8.0	24.5
35.6	7.4	43.8	245,321	6.2	33.6	7.0	17.7
28.6	5.9	47.6	201,173	5.1	29.8	7.5	18.8
37.5	8.0	48.2	219,167	5.6	36.3	6.7	23.8
34.1	4.2	47.5	168,220	4.3	34.3	7.5	19.8
46.9	7.8	59.8	376,212	9.6	39.0	8.5	21.9
		52 (2009 est.)					
		47 (2009 est.)					

ABOUT C-ADAPT

This report has been made possible thanks to the generous support of the Government of Sweden through C-ADAPT. C-ADAPT is a strategic global initiative that aims to strengthen the capacity of WFP and partners to deliver climate services to the most vulnerable and food insecure communities and help them build resilience to climate-related risks through effective climate risk analysis, adaptation planning and risk management. C-ADAPT is funded by the Government of Sweden's fast-track climate finance.

August 2016

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