



# Food Security Monitoring Bulletin INDONESIA

Special Focus: Food security in 100 districts prioritized for reduction of stunting

Volume 9, December 2017



# CLIMATE, FOOD SECURITY & NUTRITION



November 2017



Above-normal rainfall across the country  
Cyclone Cempaka - heavy rains and extreme winds in the south-eastern coast of Java



More floods and landslides



More paddy harvested

Outlook January - March 2018



X



More floods and landslides

January = PEAK RAINY SEASON

Normal to above normal rainfall expected

## Recommendations

Climate:



Prepare for more floods and landslides

The 100 priority districts:



In-depth analysis of food consumption and expenditure patterns in the 100 stunting priority districts to inform the intervention

Special Focus: Food security situation in the 100 priority districts to reduce stunting



Availability of food staples is adequate

X



Access: Affordability is a challenge for low and middle income groups

X



Consumption: Protein and energy intake inadequate for low and middle income households

X



Utilization: 40% of households did not have access to clean drinking water

# Key messages

## Climate

Weak to moderate La Niña conditions contributed to higher than normal rainfall across the country. In late November, cyclone Cempaka brought heavy rains and extreme winds to the south-eastern coast of Java. The high rainfall led to increased floods and landslides, causing destruction and damage. Higher than normal rainfall throughout the dry season led to higher paddy harvest between September and November 2017.

Over the next three months, with the continued impact of La Niña, normal to above normal rains are expected, increasing the risk of floods, landslides and associated damages. Given that Indonesia experienced an unusually high number of floods and landslides since mid-2016, the coping capacity of the affected population may be stretched, which may affect their ability to respond to the potential disasters in the upcoming months.

## Special Focus: Food Security Situation in 100 Districts prioritized for reduction in stunting

In 2017, the government launched a Presidential National Action Plan that aims to address the high levels of stunting among children under 5-years of age. The National Action Plan directs national ministries to focus their programmes and activities in 2018 on 100 districts with a high stunting prevalence, stunting incidence and a high poverty rate. This initiative has already been launched in 8 districts in 2017.

Food insecurity is one of the underlying factors contributing to stunting. Among the 100 Districts prioritized for action, 78 districts had a very high level of stunting, 19 had high, and 3 had medium levels among children under 5-years of age. Assessment of the food security situation in the priority districts shows that availability of food is sufficient, while access to food and utilization of food remain a challenge.

Availability of food staples was adequate in most of the districts. Access to clean drinking water, essential for food utilization and safe absorption of food, was below the national average in the 100 priority Districts, with 40.8% of households without clean drinking water. Economic access to food also remains a challenge for low and middle-expenditure groups. The poverty level was found to be higher than the national average in the 100 priority Districts in 2016. In the first 8 priority Districts, households in low and middle-expenditure deciles allocated more than half of their expenditure to food. Cereals constituted the largest share of food expenditure for low and middle income households, exceeding 20% of food expenditure.

Despite spending most of their income on food, food consumption among the low and middle-expenditure households was inadequate. Protein and energy intake of the most economically vulnerable households was well below adequate. On the other hand, the wealthiest households reached the recommended levels, both for protein and energy intake.

Inadequate protein and energy intake, combined with a high share of expenditure on cereals among lower- and middle-wealth groups indicate households struggle to afford an adequate diet. The analysis suggests that the high cost of cereals is hampering access to a more diverse and nutritious diet, and ultimately might be contributing to the high malnutrition rates. Lack of access to clean drinking water can also hinder safe food consumption and absorption of nutrients, and contribute to high malnutrition levels.

## Recommendations

### Climate:

- Preparedness for floods and landslides as the country enters the peak rainy season

### 100 Districts prioritized to reduce:

- In-depth analysis of consumption and expenditure patterns to inform interventions needed in the 100 Districts prioritized to reduce stunting



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# Introduction

This is the last of a series of monitoring bulletins on the impact of weather extremes on food security and seasonal topics related to food security in Indonesia in 2017. The previous bulletins are available online:

<http://bmkg.go.id/iklim/buletin-iklim.bmkg>

<https://www.wfp.org/content/indonesia-food-security-monitoring-2015>)

In the first section of this issue, an update on climate, disasters and crops is presented.

The next section presents the climate outlook for January to March 2018.

The special topic presented in last section of this issue focuses on food security situation in the 100 Districts prioritized for programmes to reduce high levels of stunting, an initiative launched by the Vice President of the Republic of Indonesia. The food security situation in the 100 districts is examined, with an in-depth assessment of consumption and expenditure patterns in the first 8 districts, where the programme already started in 2017.

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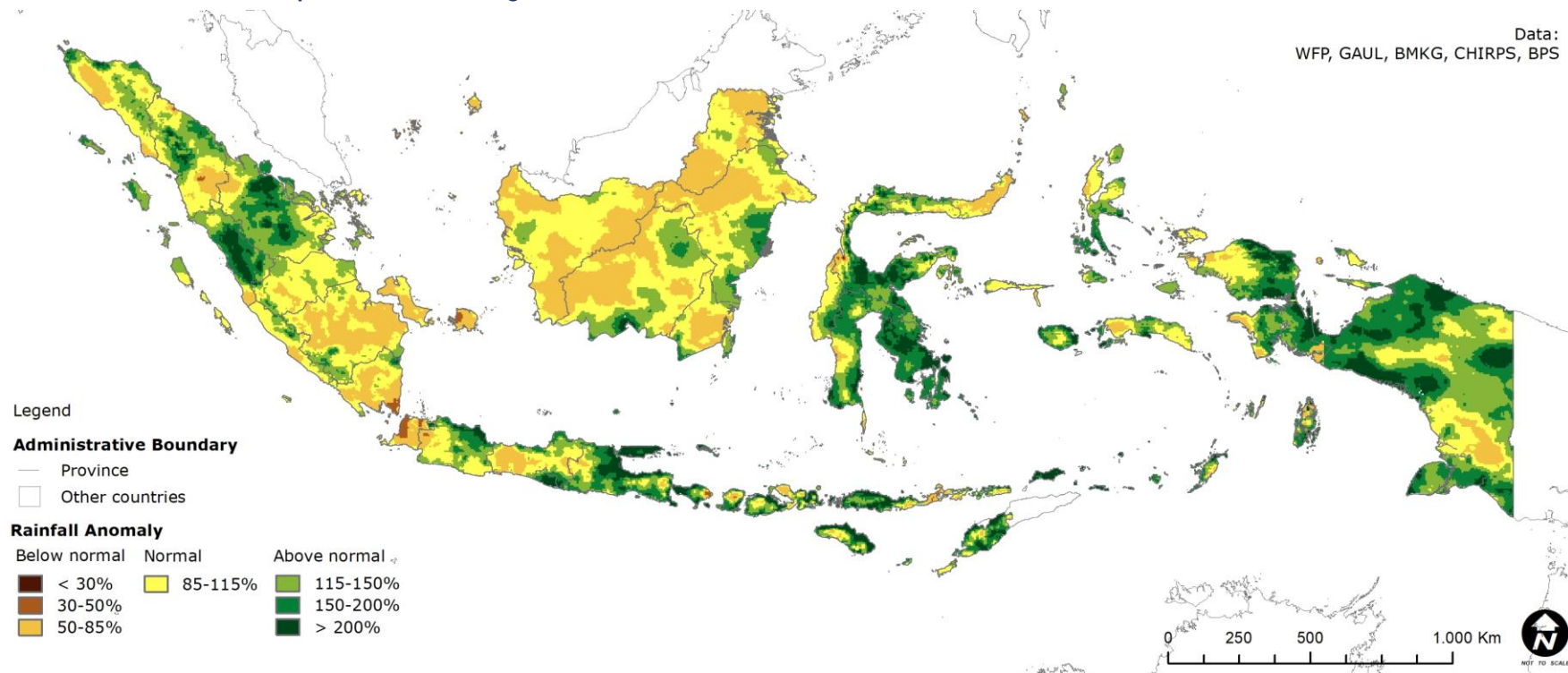
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## Wetter than normal rainy season.

In November 2017, more than 85 percent of the country was in the rainy season. Most of Indonesia received high rainfall with some localized very high rainfall, especially across the northwest of Sumatera, Central Kalimantan and Papua.

La Niña usually brings wetter than normal precipitation and heavy rains. With weak to moderate La Niña conditions affecting the region throughout November, total precipitation during November was higher than normal. Eastern parts of Indonesia, DI Yogyakarta, and central parts of Sumatera island received double the normal rainfall levels.

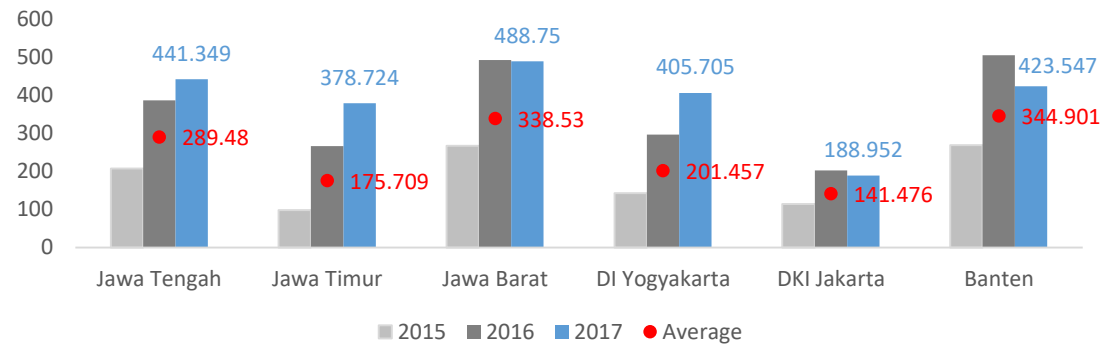
### RAINFALL ANOMALY | Percent of Average, November 2017



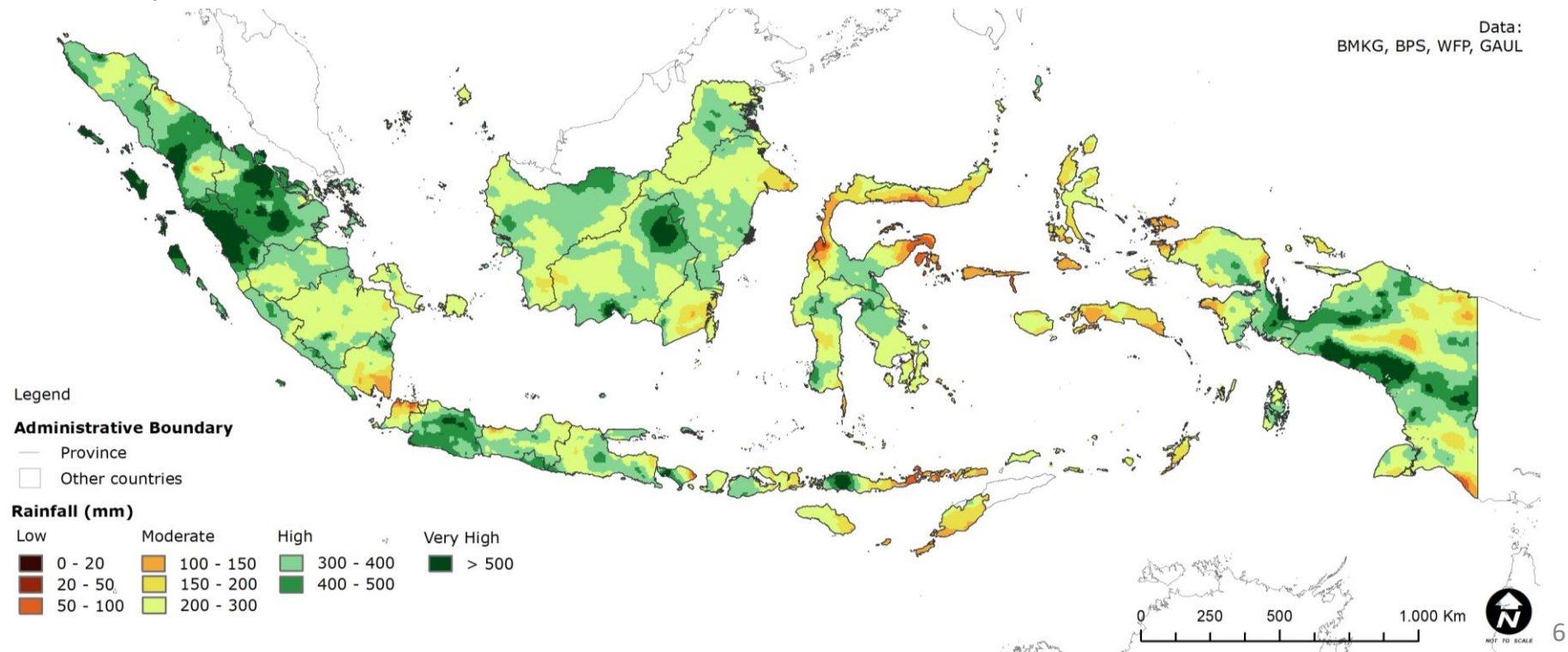
# November event: Cempaka cyclone

In November 2017, cyclone Cempaka hit south-eastern parts of Java island, bringing strong winds and heavy rainfall. In East Java and Daerah Istimewa Yogyakarta provinces, the precipitation in November was more than double the normal rainfall received during this time of the year. The cyclone led to widespread floods, localized landslides, causing damages and destruction.

Monthly precipitation across Java in November 2015 to 2017, compared to the long-term average (mm)



## Rainfall rate | November 2017



## An unusually high number of floods and landslides continued to affected Indonesia.

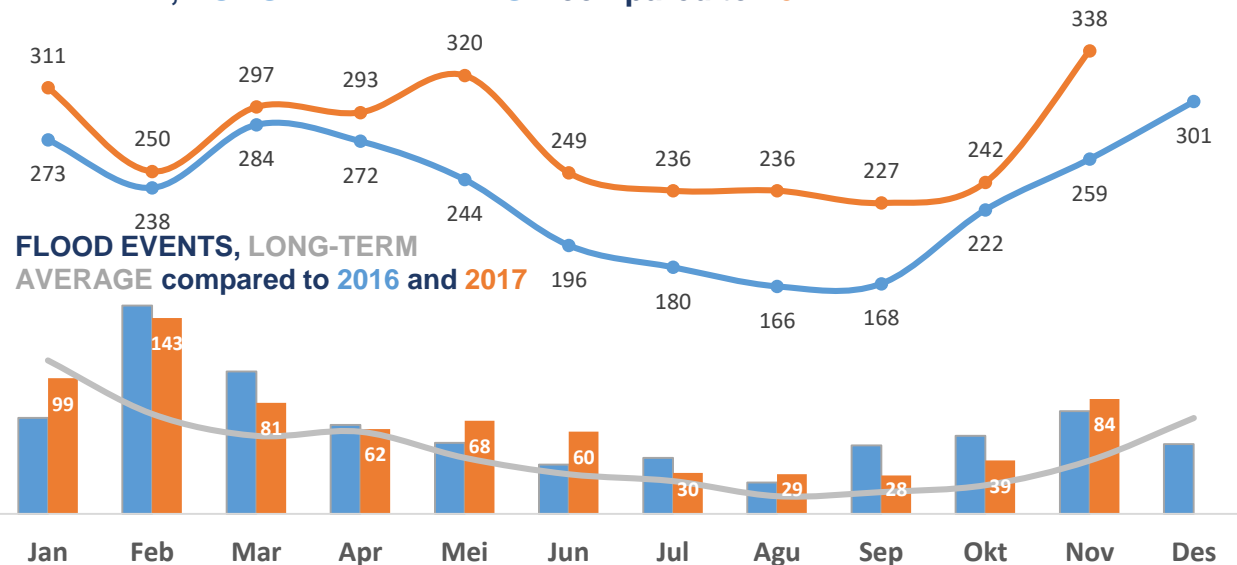
Abnormally high rainfall levels since mid-2016 led to an unusually high number of floods and landslides, compared to the long-term average.

Between January and November 2017, 729 flood events were recorded, exceeding the long-term annual average of 555 flood events. Similarly, there were 1.5 times more landslides this year until November, compared to the long-term average.

The high floods and landslides led to high infrastructure and human losses: 1,959 houses were heavily damaged, 221 people died or remain missing and 287 people were injured.

### Comparing rainfall and floods in 2016, 2017 and the 10-year average

#### RAINFALL, LONG-TERM-AVERAGE compared to 2017



Data: BNPB DIBI, WFP

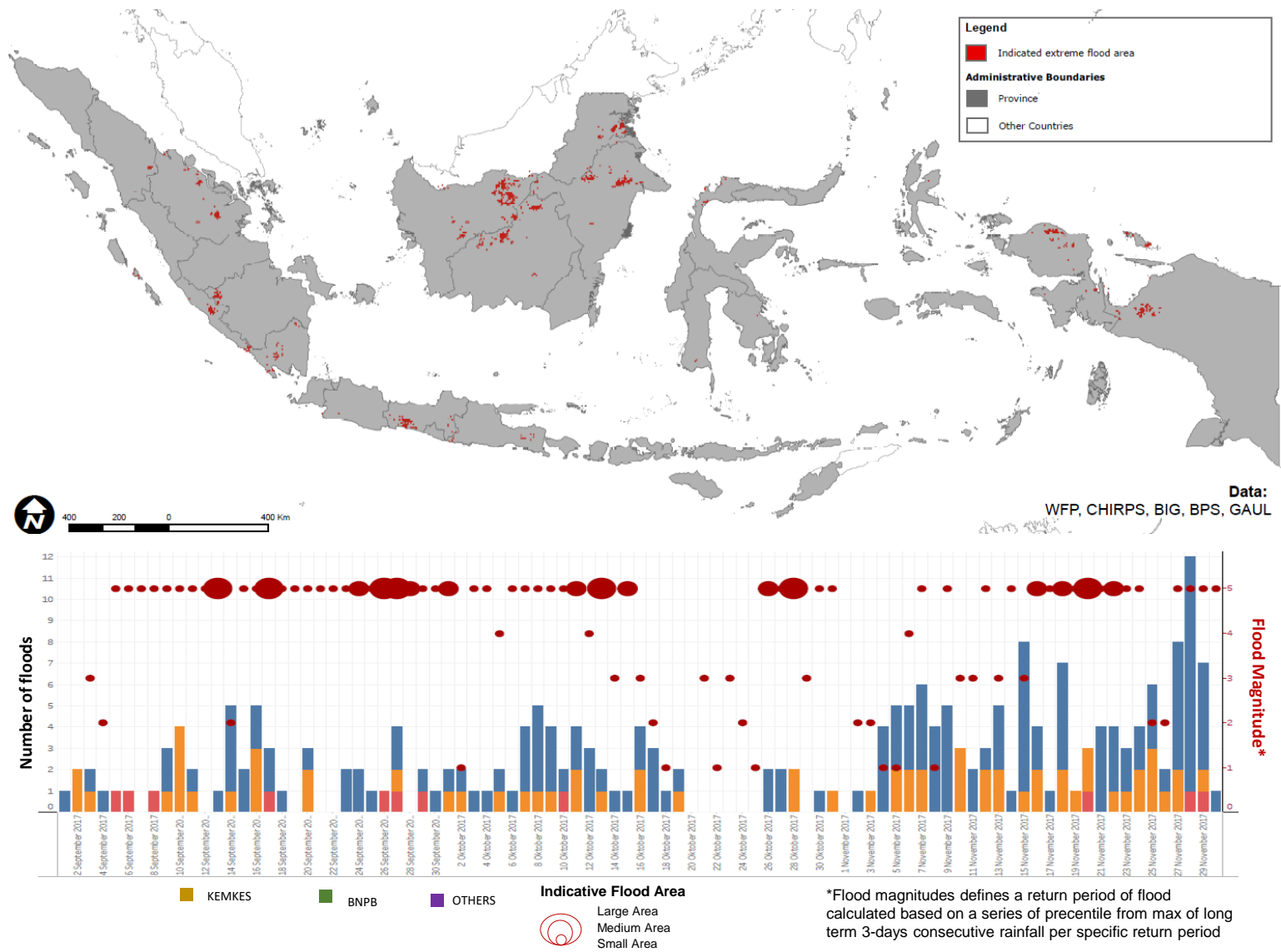
### Comparing landslide events in 2016, 2017 and the 10-year average

	10-year average	2016	2017
Jan	60	36	83
Feb	49	88	126
Mar	37	93	45
Apr	33	47	72
May	27	22	41
Jun	19	28	29
Jul	14	40	15
Aug	8	18	7
Sep	8	76	21
Oct	12	78	66
Nov	32	108	67
Dec	40	67	
Total	339	701	

Data: BNPB DIBI

Data on historical flood events are usually received through reports by field officers. An alternative data source, based on remote sensing data, independent from field presence, provides an opportunity to improve coverage of flood events and triangulate the existing evidence. Any heavy rainfall can cause flooding. The map on the right shows an indicative extreme flood area between September and November 2017, estimated through an innovative analysis of satellite data on rainfall. Indicative flood events are estimated using 3-days consecutive rainfall above a threshold defined by the long-term historical daily rainfall data for specific flood return period. The graph below presents the validation of the indicative flood events, triangulating the satellite-based analysis with reports from BNPB, KEMKES and the media. Estimates of remote-sensing data that indicate areas at risk of flooding are useful for directing resources for flood management.

**Flood Events | based on 3-days rainfall September – November 2017**





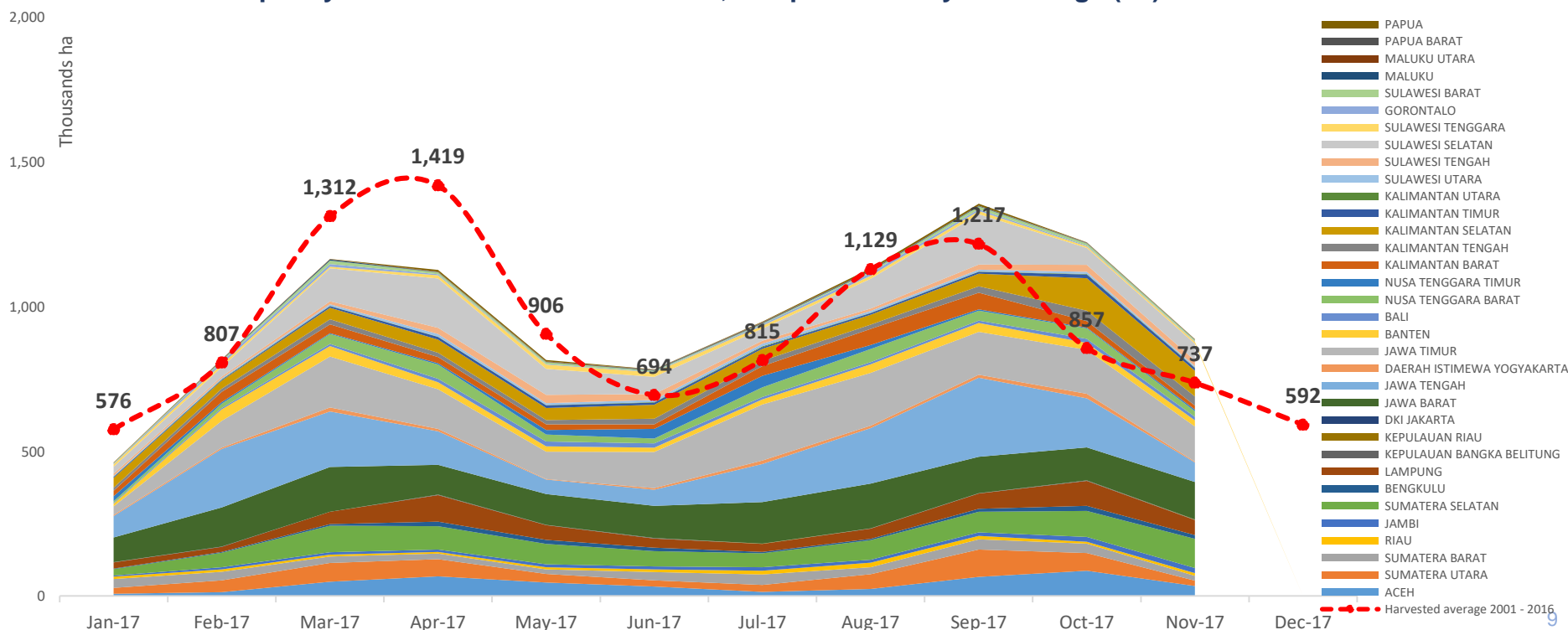
## Paddy harvest between September and November 2017 higher than normal.

To estimate progress in planting and harvesting paddy, remote-sensing data for vegetation is analyzed over the growing seasons based upon the color spectrum observed in the satellite imagery. The analysis is made by province and combines the rain-fed and irrigated croplands.

The results show that the national aggregate of harvested area between September and November 2017 is about 656 thousand hectares higher compared to the average harvested area in the same time period in the last 15 years.

The higher than normal rainfall during the dry season created favorable conditions for planting, which resulted in higher than normal harvest between September and November 2017. The change in the usual harvest pattern can also cause a shift for the next planting season.

**Harvested area for paddy from 1 Jan to November 2017, compared to 15-year average (ha)**



## January 2018 is expected to be the peak of the rainy season.

The rainy season is expected to peak in January 2018. The continued impact of La Niña is predicted to bring mainly above-normal precipitation with moderate, high and very high rainfall. In February and March 2018, the rainfall level is expected to decrease in parts of Sumatera and Kalimantan, areas where the rainy season started earlier- in October 2017. Meanwhile, high rainfall, up to 500 mm, is predicted in southern parts of Sumatera and central parts of Kalimantan. Localized very high rainfall, more than 500 mm a month, is predicted for Java and Papua. Sulawesi, Maluku and Papua are expected to experience unusually high rainfall compared to the long-term average. The high precipitation levels across the country can lead to more floods and landslides. This raises concern for the coping capacity of the already affected population, given that the country has experienced more many floods than usual since mid-2016.

### Rainfall Anomaly

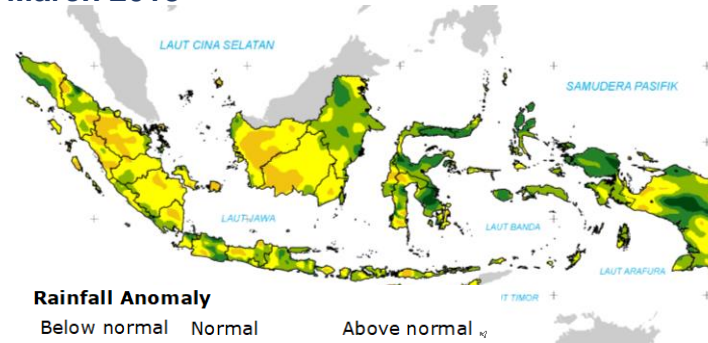
January 2018



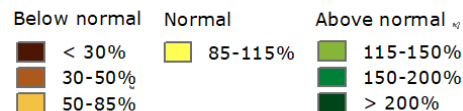
February 2018



March 2018



#### Rainfall Anomaly



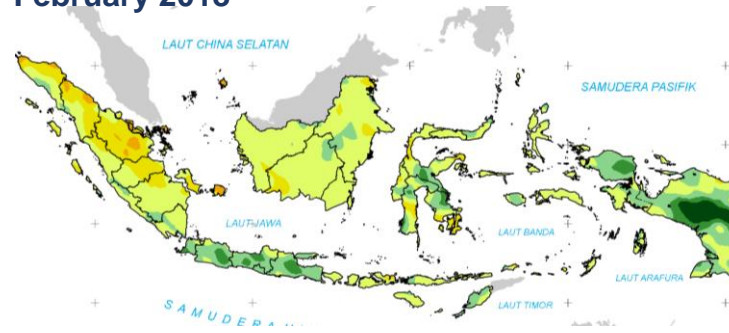
Source : BMKG

### Rainfall Rate

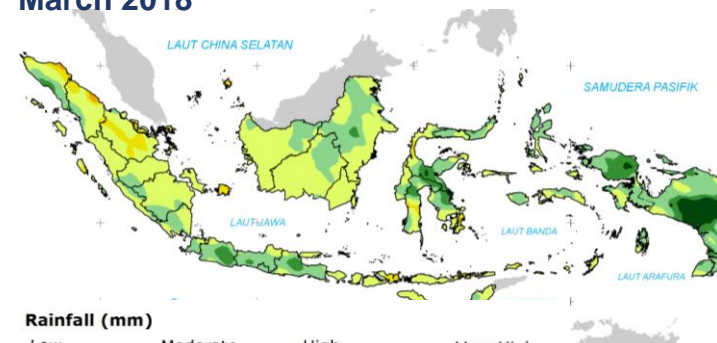
January 2018



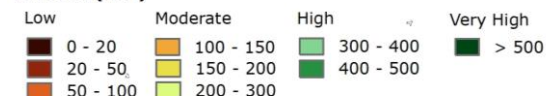
February 2018



March 2018



#### Rainfall (mm)



## PART 3 Special focus: Food security in 100 Districts prioritized for stunting reduction

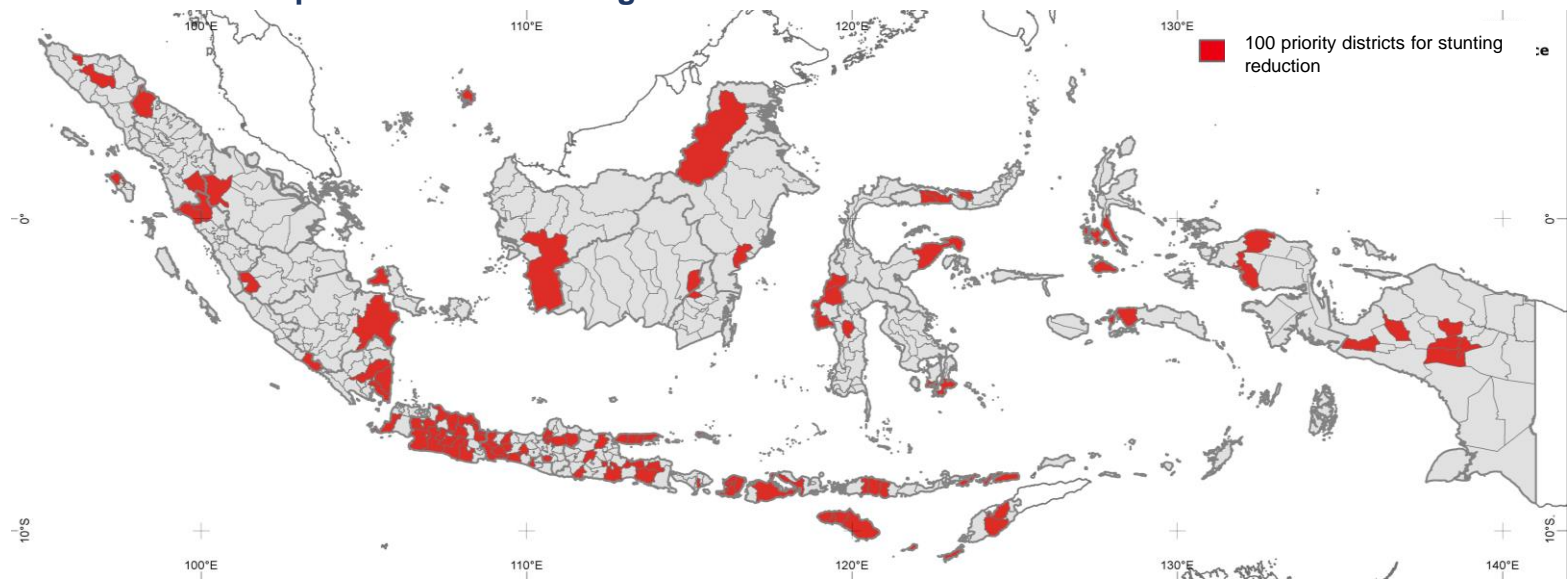
Despite the overall progress in poverty reduction, Indonesia's rates of stunting and malnutrition are critical. According to data from the 2013 Ministry of Health's Basic Health Research (RISKESDAS), 37.2 percent of Indonesian children under 5 years of age were stunted, 19.6 percent were underweight, 12.1 percent were wasted, and 11.9 percent were either overweight or obese.

In 2017, the government launched a Presidential National Action Plan that acknowledges stunting is at critical level and recognizes the need for a multi-sectoral response. The National Action Plan aims to consolidate political leadership, strengthen execution of the existing multi-sectoral policy frameworks, and drive consolidation of national, regional and community programmes. The National Action Plan directs national ministries to focus their programs and activities in 2018 on 100 districts with a high stunting prevalence, stunting incidence and a high poverty rate. This initiative was already launched in 8 districts in 2017, and will expand to 100 in 2018. The National Action Plan also lays out a plan to scale up to 160 districts in 2020, 390 districts in 2021 and to reach a full coverage in all 514 districts by 2022.

### \*Forms of malnutrition



### The 100 Districts prioritized for stunting reduction



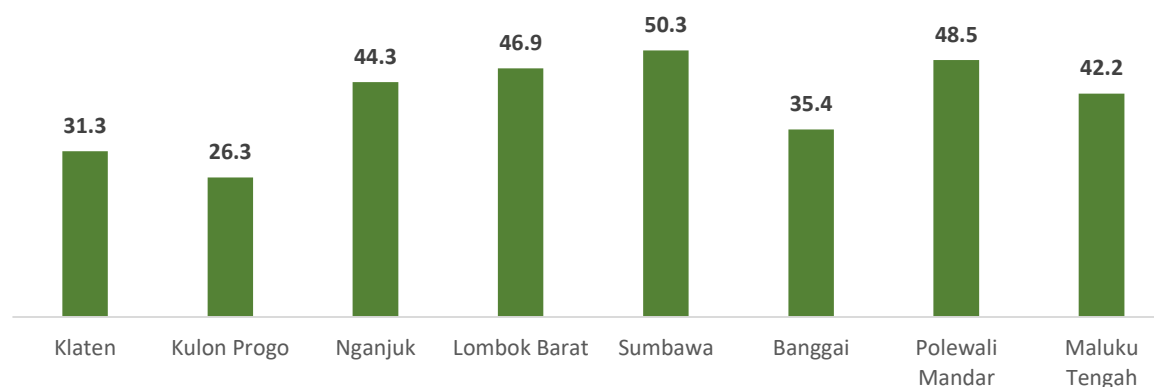
## Stunting levels in the majority of the 100 Districts prioritized for stunting reduction are very high.

Based on the 2013 Ministry of Health's Basic Health Research (RISKESDAS), the national prevalence of stunting among children under 5 years of age was 37.2 percent. This rate is considered of serious public health significance according to the WHO classification.

Among the 100 stunting priority programme districts, 78 districts had a very high levels of stunting, 19 had high, and 3 had medium levels, based on the WHO thresholds. NTT, NTB, Papua, West Java, East Java and Central Java provinces had most districts with very high levels of stunting. The highest stunting rate was found in Timor Tengah Selatan, with around 70% of stunted children under 5 years of age.

Stunting levels in the 8 districts where the programme was launched in 2017 were also very high for 5 of these districts, high for 2 districts and medium in 1 district as presented in the graph below.

**The 2013 stunting rate for children under 5 years of age in the first 8 the priority districts for stunting reduction**



Data: Riskesdas 2013



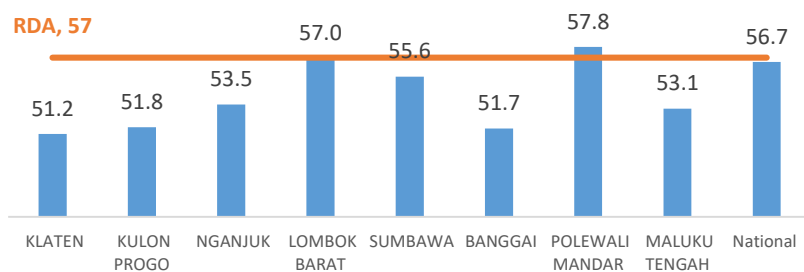
## Consumption in the first 8 priority districts for stunting reduction is below the recommended levels.

Food insecurity is one of the key risk factors contributing to stunting. A household is considered food insecure if it lacks secure physical or economic access to sufficient amounts of safe and nutritious food for normal growth and development, and for an active and healthy life. Household food insecurity affects children's health and has been associated with dietary intake as well as protein-energy malnutrition which exist in stunted children. Studies show that the risk of stunting has a statistically significant inverse association with household food security status.

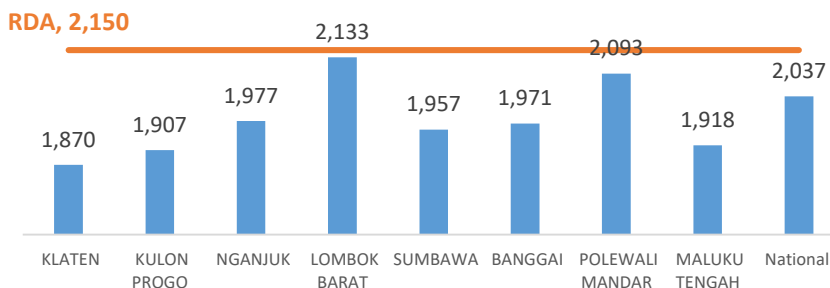
Analysis of consumption patterns in the 8 stunting priority districts revealed that energy and protein intake did not reach the recommended levels\*. As presented in the graph below, the energy intake was below the national average in 6 of these districts, with the lowest energy intake found in Klaten, Central Java.

Only 2 districts, Lombok Barat and Polewali Mandar, reached the recommended levels. Energy intake in these two districts was also the highest among the 8 priority programme districts, but still below the recommended levels. On the other hand, the lowest protein intake was in Klaten.

**Daily per capita protein intake in the first 8 priority districts in 2016, compared to the national average and the recommended intake (in gram)**



**Daily per capita energy consumption in the first 8 priority districts in 2016, compared to the national average and the recommended intake (in Kcal)**



Data: BPS, Susenas March 2016

\* The recommended levels, or RDA (recommended dietary allowance) per person per day as per the Ministry of Health Regulation, WNPG X, Article 4, 2012.

## Energy and protein intake is inadequate among 60 percent of Indonesians- poor and middle-income households.

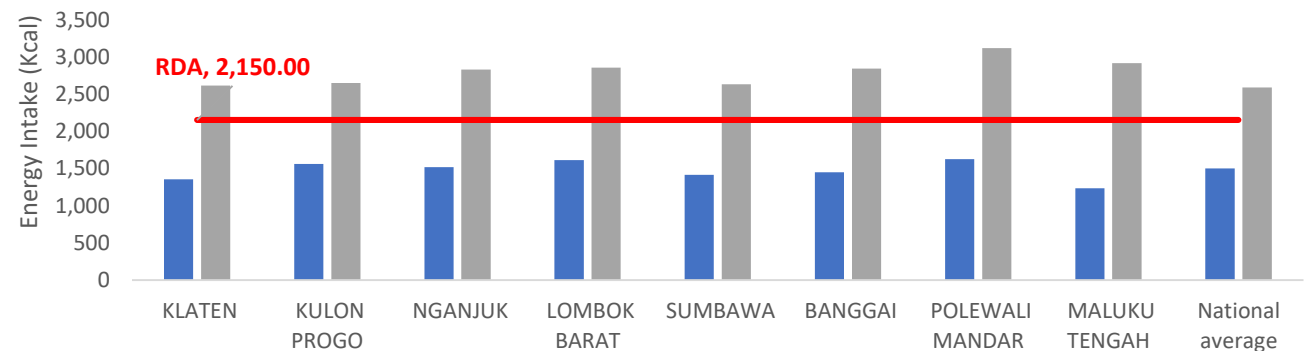
In depth analysis of the consumption and expenditure patterns shows, that across the country, poor and middle-income households do not eat enough and their diet is not sufficiently nutritious and diverse, due to affordability of food, and food staples- cereals- in particular.

Energy consumption varies substantially across expenditure deciles\* both nationally and in the first 8 priority districts for stunting reduction. Poorer and middle-income households do not meet the recommended levels and eat much less than the wealthier Indonesians.

In 2016 the wealthiest households consumed nearly double the energy compared to the poorest households, as shown in the graph below. The gap in energy consumption was the most prominent in Maluku Tengah district, where the poorest households' energy intake was nearly 60% less than the wealthiest Indonesians in the district. In all priority districts for stunting reduction, except for Kulon Progo, the difference in energy intake between the 1<sup>st</sup> and the 10<sup>th</sup> decile households was larger than the difference at national level.

In general, the recommended energy intake was reached by the wealthiest Indonesians in the top expenditure deciles (deciles 7 to 10), while poorer and also middle-expenditure groups (deciles 1 to 6) did not consume enough. The energy intake in the 1<sup>st</sup> expenditure decile was very low and well below the adequacy levels in the first 8 priority districts, no more than 75% of the recommended intake.

### Daily per capita energy intake for the 1<sup>st</sup> and 10<sup>th</sup> decile households in the first 8 priority districts, compared to the recommended dietary allowance (in Kcal)



Data: BPS, Susenas March 2016

■ Decile 1 ■ Decile 10 — RDA

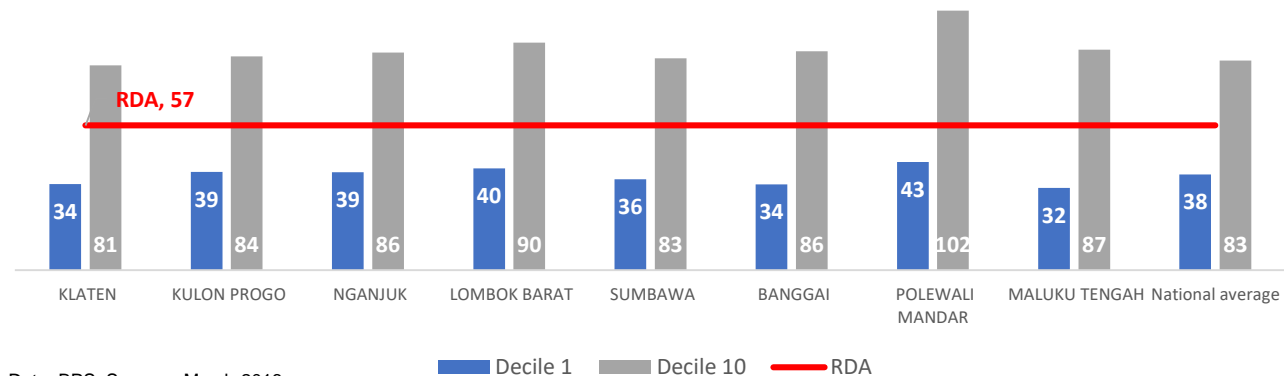
\*One expenditure decile represents 10% of the population; the 1<sup>st</sup> decile represent the poorest households while the 10<sup>th</sup> decile the wealthiest households.

Similar to the energy consumption, households in lower deciles did not consume adequate levels of protein and consumed substantially less protein compared to the wealthier Indonesians both at national level and in the first 8 priority districts for stunting reduction.

Nationally, 60 percent of low to middle-expenditure households (deciles 1 to 6), did not reach the recommended protein intake levels. Same pattern was found in 3 of the first 8 priority districts. In 4 of the first 8 selected districts, 30 percent of the wealthiest households (deciles 8 to 10) reached the recommended levels, while the protein intake in the remaining 70 percent of households (in deciles 1 to 7) was lower than recommended. In Polewali Mandar district, relatively more people (60 percent, from decile 5 to 10) consumed the adequate amount of protein, while the poorest 40 percent in deciles 1 to 4 did not. As presented in the graph below, protein intake of the most economically vulnerable households was well below the recommended level, ranging from 54 to 70% of the RDA among the first 8 priority districts and at the national level.

The most economically vulnerable households in the 1<sup>st</sup> expenditure decile consumed less than a half the protein consumed by the wealthiest households as shown in the graph below. Even for the two districts where the average protein intake was adequate (Polewali Mandar and Lombok Barat), protein intake of households in the low expenditure deciles is very low and inadequate.

**Daily per capita protein intake for the 1 and 10<sup>th</sup> decile households in the first 8 priority districts, compared to the recommended dietary allowance (in grams)**



Data: BPS, Susenas March 2016

## Consumption by food group.

### Contribution of prepared food the total protein intake

Districts	Protein
KLATEN	24.33%
KULON PROGO	26.99%
NGANJUK	16.28%
SUMBAWA	18.50%
BANGGAI	10.50%
POLEWALI MANDAR	12.34%
MALUKU TENGAH	12.44%

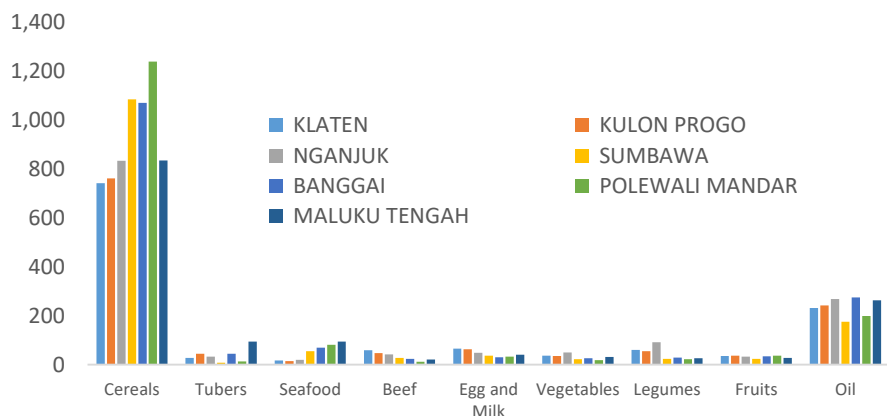
Food is one of the key determinants of the nutritional status of humans. Diverse food, which consist of several food groups, is a prerequisite for optimum nutrition outcomes in adults and children. Dietary diversity is a measure of food consumption that reflects household access to a variety of food, and of nutrient adequacy of a diet. Higher household dietary diversity was significantly associated with lower likelihood of a child being stunted, both internationally and in Indonesia.

Cereals contribute to the highest share of calorie and protein intake nationally and in the 8 stunting priority programme districts. Fish and other seafood were the main sources of animal protein, followed by beef, eggs, and milk.

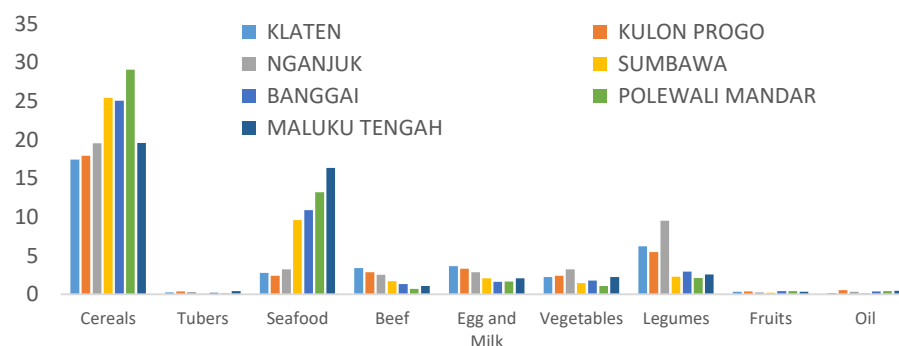
In 2 districts, Klaten and Kulon Progo, one quarter of protein intake is from prepared-food. While in other districts prepared food contribute to a smaller share of protein intake, its share is increasing. As such prepared-food vendors have important roles in the dietary pattern of the population, as well as the safety and quality of the food.

The data indicates that Indonesians rely heavily on cereals for their energy and protein, while other food groups show low consumption levels. Increased awareness on the importance of diverse diet is needed to ensure diet of Indonesians is adequate and contributes to the optimum nutrition outcomes in children and adults.

### Daily per capita energy intake by food group in the priority districts for stunting reduction (Kcal)



### Daily per capita protein intake by food group in the priority districts for stunting reduction (gram)



Data: BPS, Susenas March 2016



## Availability of food staples is adequate in the majority of the priority districts for stunting reduction.

The production of cereals and tubers in Indonesia has steadily increased over the last ten years. Rice production has grown by 3.7 percent, maize by 6.7 percent, cassava by 0.5 percent and sweet potato by 1.3 percent per year. In general, food availability at the national level is adequate.

Out of the 100 stunting priority districts, 11 districts did not produce enough cereals and tubers, to meet the normative per capita consumption. Most of the cereal and tuber-deficient districts were in Papua, Papua Barat, Kepulauan Riau, Kepulauan Bangka Belitung and Sumatera Utara.

Sufficient production may be constrained by climate conditions, land suitability and recurrent disasters such as droughts and floods. However, areas with a deficit in local cereal production usually procure cereals from surplus areas and thus ensure sufficient supply.

### The priority districts for stunting reduction with cereal production deficit

Province	District
Papua	Nduga
	Lanny Jaya
	Dogiyai
	Intan Jaya
	Tolikara
Papua Barat	Sorong Selatan
	Tambrau
Dki Jakarta	Kep. Seribu
Kep. Bangka Belitung	Bangka Barat
Kepulauan Riau	Natuna
Sumatera Utara	Nias Utara

Data: BKP, WFP 2017

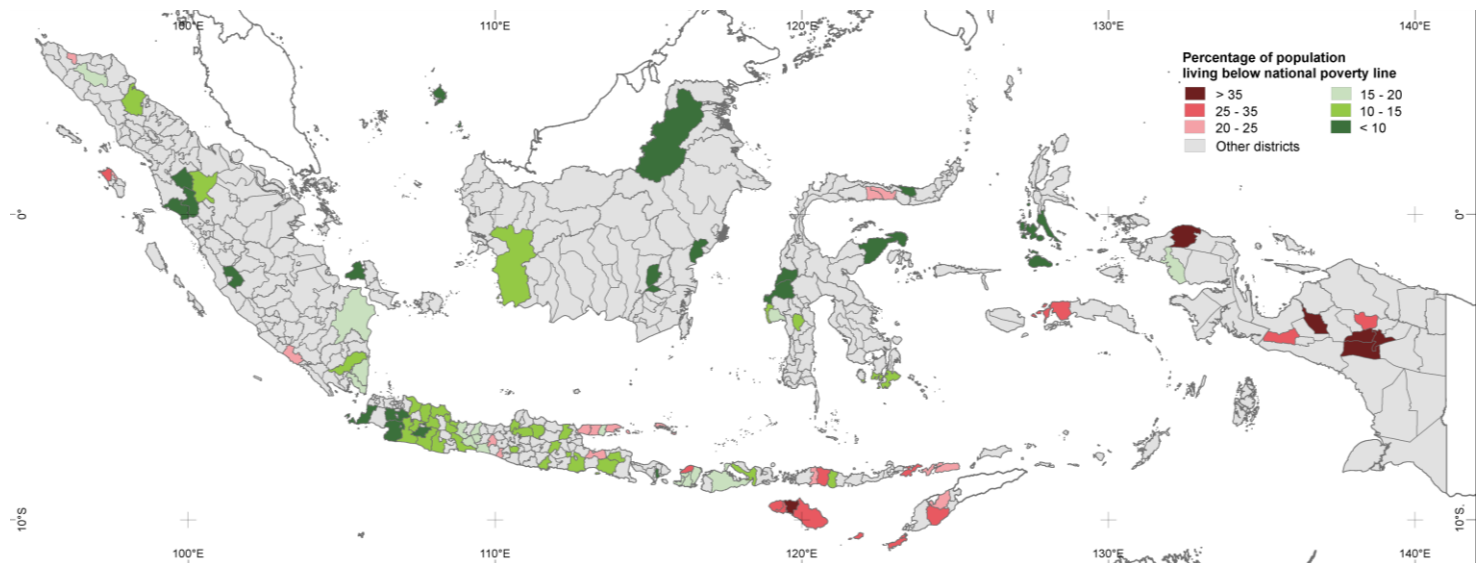
## Access to food remains a challenge.

While the availability of food in Indonesia was found to be adequate, limited access to food, especially for the poor households, remained a challenge. Food access concerns economic and physical access to food. Physical access to food refers to ways of reaching market, market infrastructure and the functionality of the market. Economic access concerns a household's ability to acquire adequate amounts of food through direct purchases, its own home production and stocks, barter, gifts, borrowing, and food aid. In Indonesia, a combination of poverty, lack of stable employment, low and irregular cash income and limited purchasing power hinder food access, especially for poor Indonesians.

At national level, the poverty rate declined from 11.25 percent in 2014 to 10.64 percent in 2017, with 27.77 million people still living in poverty. In 2017, out of 34 provinces, 16 provinces had a poverty level higher than the national average, with Papua province having the highest proportion of poor people (27.62%). The poverty rate was higher than the national average in 78 of the 100 priority districts for stunting reduction. As at national level, the highest level of poverty is found across the priority districts in Papua and Papua Barat provinces.

In terms of the physical access to food, out of 100 stunting's districts, there were five districts where at least half of all villages lacked access to roads or waterways. All of these five districts were located in Papua province.

### Poverty rate in the 100 priority districts for stunting reduction



## Low and middle-income households spend more than half on food.

Household food expenditure is a good measure of household economic access to food, and is indicative of food security situation in terms of households ability to acquire adequate food. In general, household expenditure on food that exceeds half of all expenditure indicates economic vulnerability, and can affect access to food.

In Indonesia, 80% of low and middle-expenditure households (in deciles 1 to 8 ) spent more than half of their expenditure on food in 2016, and spend a significantly greater share of their money on food compared to the wealthiest 20% of the population.

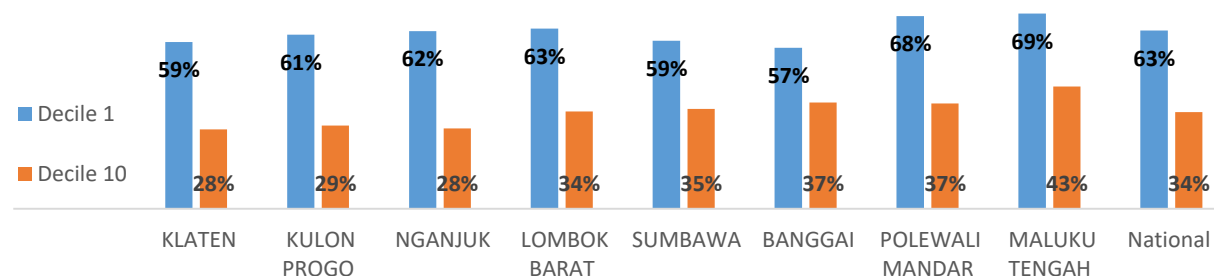
\* Based on Smith et al. 2007 categorization of households food expenditure vis-à-vis food security

In depth analysis of the expenditure patterns in the first 8 priority districts revealed the same trend in 5 of the districts, with 80 percent of low- to middle-income households spending more than half of all expenditure on food. In Maluku Tengah, more households- 90%- spent more than half on food, 70% of households in Nganjuk and 60% of households in Klaten. The highest proportion of food expenditure, above 65 % was found in Maluku Tengah for households in the first expenditure decile, and in Polewali Mandar for 1<sup>st</sup> and 2<sup>nd</sup> decile households as show in the graph below. Households that spend more than 65% of their expenditure on food are considered to have high food insecurity\*.

At national level, the share of expenditure on food is the highest for households in the 1<sup>st</sup> expenditure decile, gradually decreasing for higher expenditure deciles. The same pattern was observed in 3 of the selected districts, while the remaining 5 districts showed a less consistent pattern, with some middle-expenditure groups spending an equally large proportion on food as low expenditure households.

Despite the large share of expenditure that the poor and middle-income groups spend on food, these households have an inadequate food consumption. They are vulnerable to shocks, such as price spikes or income fluctuation, which can further decrease the already low consumption levels and deteriorate their food security situation.

### Proportion of monthly households expenditure on food compared to the total expenditure by expenditure decile in the 8 stunting priority programme districts in 2016



Data: BPS, Susenas March 2016

## Lower and middle income groups spend most on cereals.

Similar to the overall food expenditure, household expenditure on specific food groups varies substantially across deciles nationally and in the first 8 priority districts. In 2016, households in the lowest expenditure decile in the first 8 priority districts spent the largest proportion of their food expenditure on cereals (ranging from 22.3% to 39%). In addition to the lowest expenditure decile, middle-expenditure households in 5 of the 8 districts also spent more than 20% of their expenditure on cereals. The highest number of households (70%) using more than 20% of food expenditure on cereals was in Banngai and Polewali Mandar, followed by Lombok Barat and Sumbawa with 60% of households. A similar trend is found at national level, with the poorest households spending the largest share of their food expenditure on cereals (28.8%), and 30 % of the lower-expenditure households spending more than 20% on cereals.

On the other hand, for the wealthiest households, prepared foods (39.6%) followed by dairy and eggs (7.7%) represent the largest food expenditure at national level. Prepared foods also constitute the highest share of food expenditure for the 10<sup>th</sup> decile-households in the first 8 priority districts (ranging from 19.1% to 46.5% of food expenditure).

At national level, share of food expenditure on cereals shows a gradual decline from the lower to higher expenditure deciles, while the share of food expenditure on prepared foods shows a reversed pattern, declining with lower expenditure deciles.

Cereals alone are however do not provide adequate nutrition required for healthy lifestyle free from any forms of malnutrition. Dietary diversity and protein intake, and the consumption of fish and meat/poultry in particular, are significantly associated with child stunting (1). Similarly, household expenditure on animal protein sources was found to affect nutritional status of children. A study involving a population-based sample in rural and urban children in poor areas in Indonesia showed that the higher household expenditure on animal-source and non-grain foods lowered the risk of stunting among children 0-59 months old (2).

Both at national level and in the 8 priority districts, meat, eggs and dairy, and fruits represent the lowest expenditure share for the lower expenditure deciles (1.7%, 4% and 2.1% for the first expenditure decile respectively). Expenditure on these food groups increases gradually for the higher expenditure deciles, where the highest expenditure deciles have considerably larger expenditure, both in nominal terms and as a proportion, than the lower wealth groups.

Inadequate protein and energy intake, combined with a high share of expenditure on cereals among lower wealth groups indicate affordability of cereals may constrain households ability to acquire adequate diet quantity and quality. The analysis indicates that the high cost of cereals is hampering access to a more diverse and nutritious diet, and ultimately might be contributing to high malnutrition rate.

(1) Mahmudiono, T., et al.. Household dietary diversity and child stunting in East Java, Indonesia. Asia Pacific journal of clinical nutrition. 2016

(2) Sari M, et al. Higher household expenditure on animal-source and nongrain foods lowers the risk of stunting among children 0-59 months old in Indonesia: implications Dietary diversity and child stunting 325 of rising food prices. J Nutr. 2010



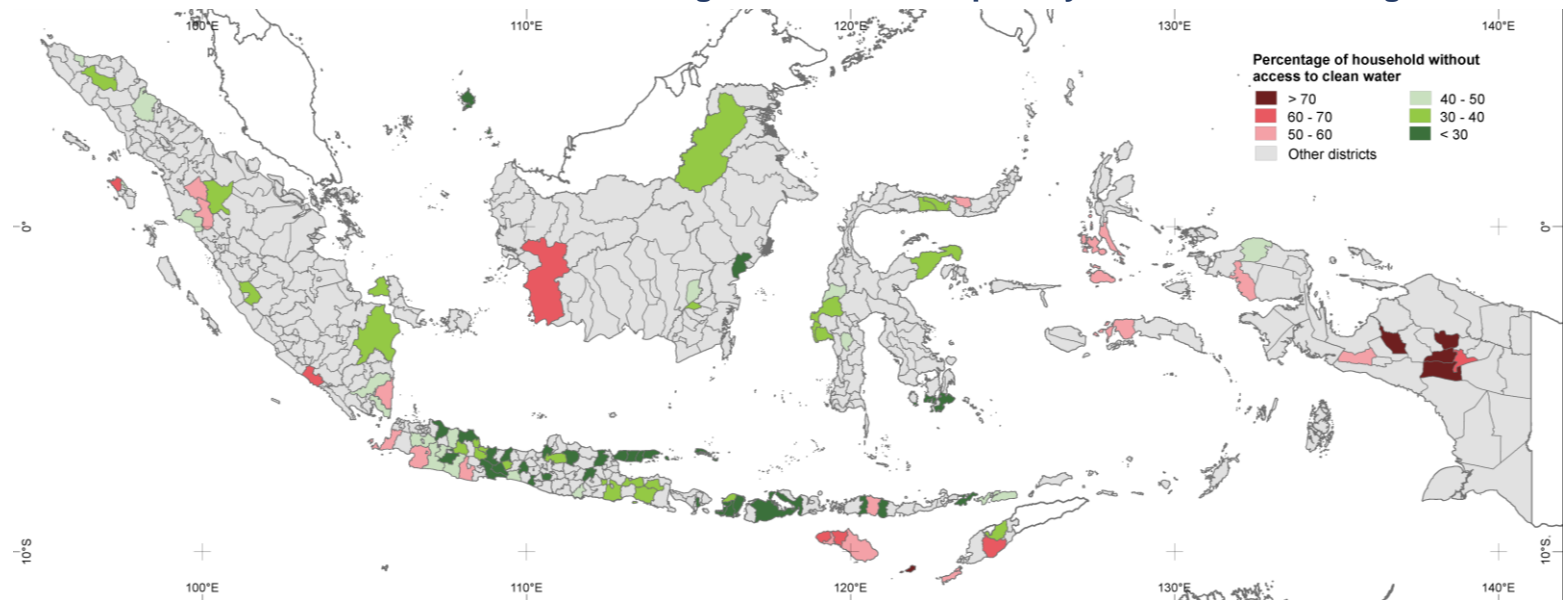
## Food utilization- 40% of the households in the 100 districts did not have access to clean drinking water.

Food utilization refers to a household's use of the food to which it has access, and an individual's ability to absorb nutrients. Food utilization depends on the facilities available for food storage and processing, knowledge and practices in food preparation and the feeding of young children, which may be affected by the education of mothers and other caregivers, cultural beliefs. The health status of an individual affects their ability to absorb nutrients and may be impaired by disease, poor hygiene, water and sanitation and lack of access to health facilities and health care.

Nationally, 28.86% of households did not have access to improved drinking water in 2016. The poorest access was in Kalimantan Selatan, Papua, Lampung and Sulawesi Barat provinces. In the 100 priority districts for stunting reduction, the average percentage of households without access to water was higher than at the national level, reaching 40.8%. Lanny Jaya and Nduga districts in Papua province had the highest percentage (99%) of households without access to safe drinking water. Lack of access to clean drinking water can hinder households ability to absorb food and nutrients safely, and can contribute to high rates of malnutrition.

The literacy level of women, especially the mothers and caregivers of young children, is well known as an important determinant of food utilization and a factor that impacts the overall health and nutrition status of household members. In 2016, the national female illiteracy rate was 6.41%. The highest illiteracy rate was in Papua (29%), NTB (13%) and Sulawesi Selatan (9%) provinces. At the district level, 9 out of the 100 priority districts had a high illiteracy rate, of 20% or more.

**Households without access to clean drinking water in the 100 priority districts for stunting reduction**



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# Methodology

Rainfall anomaly is a measure of a lack or excess of rainfall in a period compared to the average. The 3-monthly rainfall anomaly for Jul-Aug-Sept 2017 is derived from BMKG and CHIRPS long-term average dataset. Actual rainfall for Nov 2017 and forecast for Jan- March 2018 uses BMKG data. Thresholds for anomaly follows a standard protocol.

State of planting and harvesting estimates were determined by importing MODIS Vegetation (MOD13Q1 - 16 days and 250m resolution) data into TIMESAT – a program for analyzing time-series satellite sensor data. TIMESAT conducts pixel-by-pixel classification of satellite images to determine whether or not planting has yet begun. This process was followed for all of Indonesia over multiple years in order to evaluate current planting vis-à-vis historical years from 2001 - 2016.

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Assessment of flood and landslide events and their impact is a trend analysis, comparing long-term averages with the current situation. The analysis is based on the data from the National Disaster Management Agency (BNPB).

Indicative flood events is based on analysis of satellite data, using the 3-days of consecutive rainfall in the selected time period and thresholds defined for a specific return period (RP). The long-term historical daily rainfall (1981-2016) uses CHIRPS dataset to define these threshold. The thresholds are based on the maximum 3-days consecutive rainfall in 1 year in an area, which is used to calculate the percentile for the corresponding RP (0.99 for 100 year flood RP, 0.98 for 50 years RP, 0.96 for 25 years RP, 0.9 for 10 years RP, and 0.8 for 5 years RP), which also defines flood magnitude. The indicative flood events are validated using reports from BNPB, KEMKES an media.

Food security analysis of the 100 stunting priority programme districts combines analysis used in the Food Security and Vulnerability Atlas (FSVA), and in-depth analysis of expenditure and consumption trends using March 2016 National Socioeconomic Survey data from the National Statistics Agency (Susenas-BPS). The total sample of the March Susenas is 300,000 households, covering the entire country. The detailed explanation of the Susenas dataset and methodology is available via BPS publication, accessible through the BPS website. The FSVA analysis uses the FSVA 2015 methodologies, with the latest available data from various sources, mainly Susenas and data from the Ministry of Agriculture. Detailed methodology and dataset description is available in the FSVA 2015 publication.

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# Contributors

This bulletin is produced by a technical working group led by the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) and consisting of the Ministry of Agriculture (incl. the Agency of Food Security, the Directorate General of Food Crops, the Indonesian Agency for Agricultural Research and Development, Information and the Data Center, Directorate General Horticulture), the National Institute of Aeronautics and Space (LAPAN), National Disaster Management Authority (BNPB) and the Central Bureau of Statistics (BPS).

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All content within this bulletin is based upon the most current available data. Weather conditions are a dynamic situation, hence the current realities may differ from what is depicted in this document.

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