

**Voluntary Report** – Voluntary - Public Distribution

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**Report Name:** Taiwan Drought Results in Rice Area Reduction and Crop Loss

**Country:** Taiwan

**Post:** Taipei

**Report Category:** Agriculture in the News, Agricultural Situation, Avocado, Canned Deciduous Fruit, Dried Fruit, Fresh Deciduous Fruit, Fresh Fruit, Kiwifruit, Raisins, Stone Fruit, Strawberries, Grain and Feed

**Prepared By:** Oscar Lin; Erik Syngle

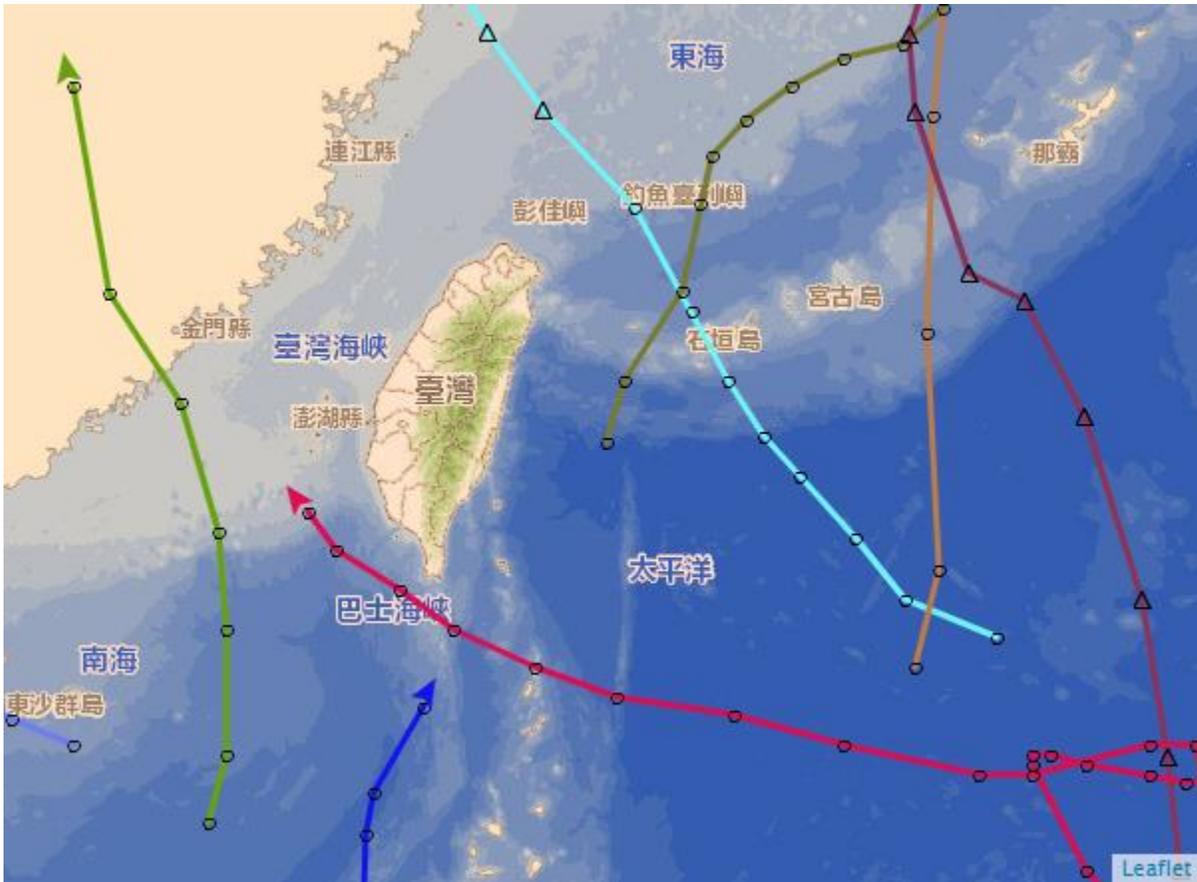
**Approved By:** Mark Petry

**Report Highlights:**

Taiwan has experienced a serious water shortage since late 2020. For the first time in 56 years, no typhoons passed through Taiwan in 2020 to replenish its reservoirs. To conserve water, Taiwan has stopped irrigating 74,000 hectares of first crop rice in 2021, representing 24 percent of total planted area. Major crops impacted by the heat and drought since March 2021 include mango, lychee, tea, oranges, and longan, with monetary loss exceeding NT\$824 million (U.S. \$29.7 million). With plum rain season starting in June and typhoon season following soon after, most forecasts expect the water situation will improve in the second half of 2021.

## Overview of Taiwan's Current Water Situation

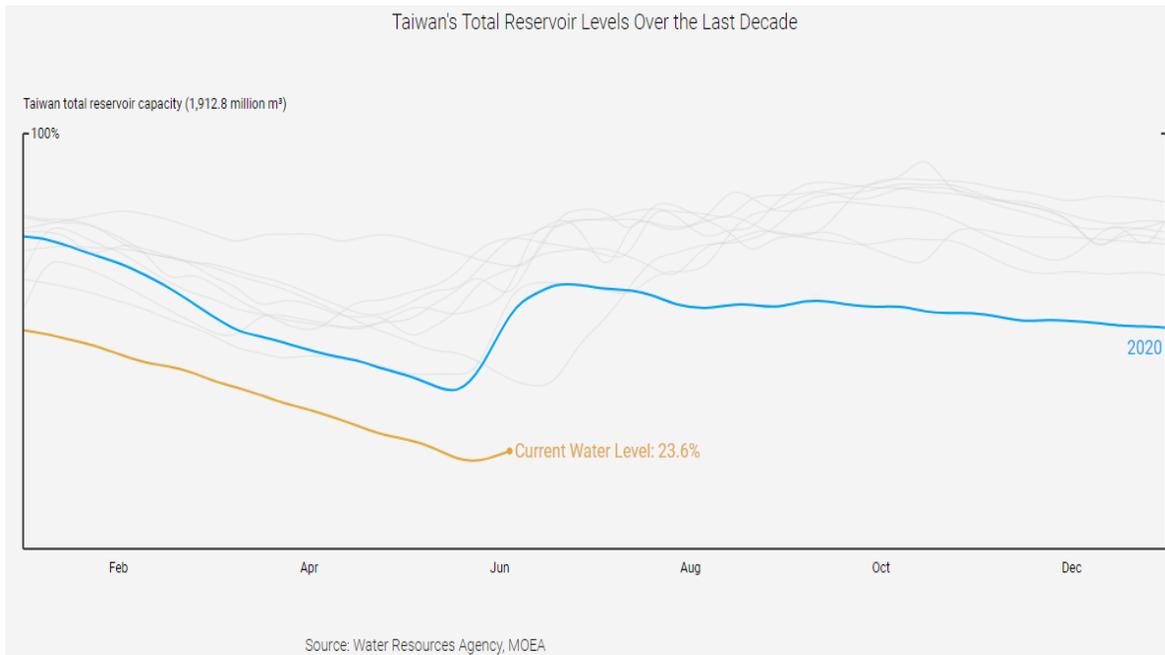
For the first time since 1964, no typhoons made landfall on Taiwan in 2020. This has led to historically low water levels in reservoirs. In May 2021, reservoir levels reached below 20 percent. To conserve water, cities, and counties in Central and South Taiwan have implemented various water rationing measures, including those directly impacting agriculture and irrigation.



**Typhoons that missed Taiwan in 2020 / Source: Central Weather Bureau Typhoon database**

The situation is causing enough concern that even U.S. media (including [The New York Times](#)) have reported on the potential impact of the drought to worsen the worldwide microchip shortage due to Taiwan's critical global role in the semiconductor industry. For example, Taiwan Semiconductor Manufacturing Company (TSMC) is [reported](#) to be spending NT\$800 million (U.S. \$28.6 million) on water management.

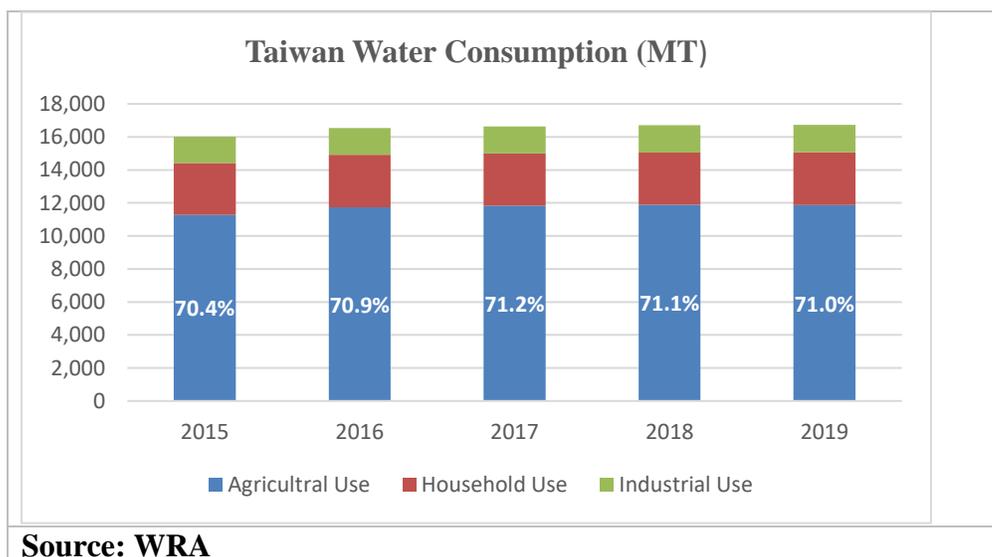
Recent high-quality images of Taiwan's drought can be found in this [New York Times](#) report from May 2021.



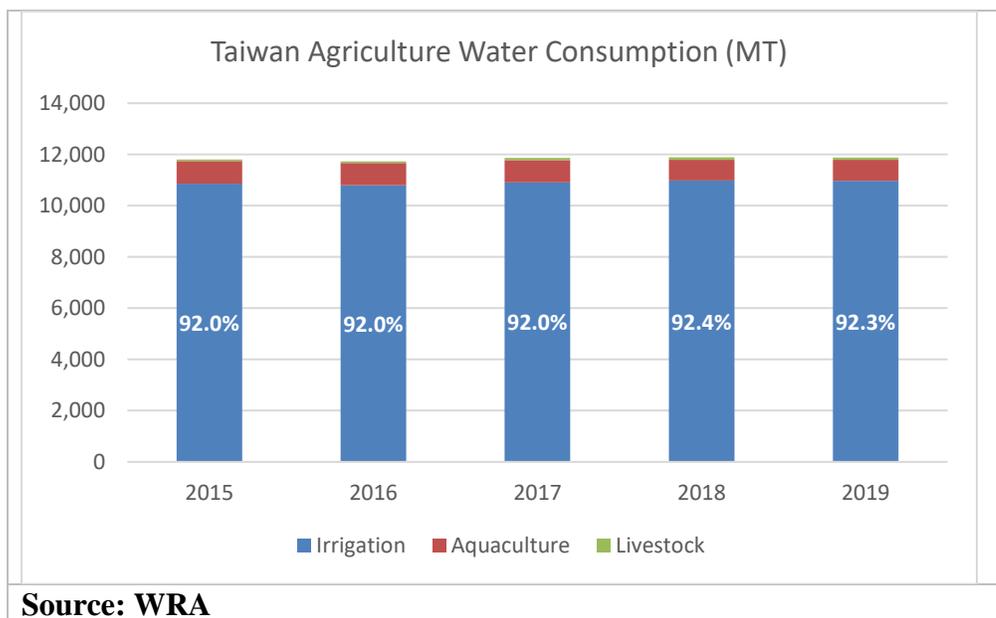
Source: [Common Wealth](#)

### Agricultural Water Use

Taiwan's average annual agricultural water consumption has been 12.3 billion MT over the past ten years, which accounts for 72 percent of total water consumption (17.1 billion MT) in Taiwan. Household and industrial use account for 19 percent (3.2 billion MT) and 9 percent (1.6 billion metric tons), respectively.



Total irrigation water consumption averages 11.3 billion MT, with 10 percent coming from reservoirs, 66 percent from rivers, 20 percent from weirs, and four percent from groundwater. Aquaculture accounts for 1.0 billion MT and livestock use accounts for the remaining 0.1 billion MT.



Taiwan has about 310,000 hectares of farmland in irrigation, of which about 236,000 hectares are irrigated by diversion from rivers, with the remaining 74,000 hectares irrigated from reservoirs.

Additionally, there are 318,000 hectares of farmland that are rain fed and not irrigated. Apart from the few areas that have water storage irrigation, most of the rain fed production areas will likely be negatively affected by the drought.

For more detailed information, see the Council of Agriculture (COA) [April 2021 presentation](#) (Chinese only) on water conservation strategies for hillside land and state-owned forest land.

### Taiwan Rice Planting Cycle

Rice	Planting	Earing	Harvest
1 <sup>st</sup> crop	late February	late May	late June
2 <sup>nd</sup> crop	late July	early October	mid-November

## COA Response and Compensation

In October 2020, a preemptive measure to conserve water use was introduced that halted irrigation for 19,000 hectares (Taoyuan, Hsinchu, Miaoli, and Taichung counties), including 13,000 hectares of second rice crop and 6,000 hectares of corn, soybean, buckwheat, forage grass, sweet potatoes, peanuts, and leafy vegetables. Because the second rice crop was already in the earing stage and the abrupt halt to irrigation caused damage to existing plantings, COA offered NT\$140,000 (U.S. \$5,050) per hectare in compensation for farmer losses. For the non-rice acreage, COA is paying out money for damages according to [a compensation scheme](#) based on the affected crop.

As the drought situation continued to worsen in the second half of 2020, in late 2020 COA announced that irrigation would also be halted for 74,000 hectares of 2021 first crop rice in which the water was sourced from reservoirs. In this round, since the crops had not been planted, compensation will be disbursed in two different ways:

- 1) Farmers who do not plant rice but plant green manure, landscape vegetation, or various incentive crops that meet the "Green Environment Benefit Plan for Land" will be compensated at NT\$93,000 (U.S. \$3,354) per hectare.
- 2) Farmers who do not plant rice but who apply to plow or plant non-incentive crops will be compensated at NT\$82,000 (U.S.\$2,957) per hectare.

## Taiwan Rice Drought Compensation Scheme

Rice	Affected area (HA)	Affected location	Planted area in 2020 (HA)	Compensation
2 <sup>nd</sup> crop 2020	13,000	Taoyuan	102,000	NT\$1.82 Billion
1 <sup>st</sup> crop 2021	74,000	All Taiwan	161,000	> NT\$7 Billion

## Food Security Concerns For Rice

With 46 percent of rice planting area left fallow for the first 2021 crop, production will be significantly impacted. By comparison, in 2020, first crop rice production amounted to 1.1 MMT.

According to Taiwan's "[Domestic rice safety stock standard](#)" under Article 5 of [The Food Administration Act](#), a safety stock of no less than 3 months (300,000 MT) consumption is required. Taiwan's recent surge in COVID infections has also heightened concern over domestic food security. (For more information on Taiwan's food stocks, see "Taiwan Confident of Basic Food Supply Amid Second Wave of COVID Infection" GAIN [TW2021-0034](#))

However, as of mid-May 2021, Taiwan held 750,000 MT of rice in stock, which is enough supply normal consumption levels for 7.5 months. Although reduced, the remaining 2021 first rice crop will be harvested soon. Therefore, even a reduced first crop should leave Taiwan well over its stated food security goal for rice stocks.

### **Drought Mitigation Strategy**

Various reports suggest that old water storage, transportation, and irrigation infrastructure leads to a significant amount of water loss in the system for both agriculture and non-agriculture uses. Though there are several ministries involved in infrastructure development, COA's budget for subsidizing water pipeline repair and conservation construction is about NT\$200 million (U.S.\$7.2 million) per year with an NT\$400,000 (U.S.\$14,424) per household maximum. As of April 2021, the whole budget has been utilized.

As of May 20, 2021 there were a total of 3,512 applications from farmers for approximately NT\$294 million (U.S.\$10.6 million). COA will prioritize applications submitted through June by the end of this year.

### **Other Crops Damaged by Heat and Drought**

Since March 2021, COA's Agriculture and Food Agency (AFA) has been publishing regular updates on crops that were damaged by heat and drought. The most recent data covers through June 3, 2021 and [can be found here](#) (Chinese only).

Estimated losses amount to NT\$824.5 million (U.S.\$29.7 million). The damaged area covers 15,043 hectares, the degree of damage was 25 percent, and the converted area loss totals 2,859 hectares.

AFA received approval to give monetary compensation based on the losses, details can be [found here](#) (Chinese only).

### **Major crops damaged (list not exhaustive):**

<b>Damaged Crops</b>	<b>Damaged Area (HA)</b>	<b>Degree of Damage (%)</b>	<b>Converted area Loss (HA)</b>	<b>Amount of Loss (NT\$ million)</b>
Improved-seed mango	1,882	40	750	236.2
Lychee	2,856	26	739	109.4
Tea	1,929	21	406	109.2
Ponkan	689	25	171	61.6

Oranges	751	24	181	56.3
Longan	1,261	30	379	43.1
Bamboo shoots	1,132	22	244	34.6
Pear	408	11	44	33.3
Native-seed mango	367	31	115	25.2
Plum	905	26	239	18.4
Onion	163	33	54	14.6
1st Crop Rice	690	13	88	8.9
Other crops	2,010		1,113	73.7
<b>Total</b>	<b>15,043</b>	<b>25</b>	<b>3,773</b>	<b>824.5</b>

#### Damage by city and county:

Location	NT\$ million	%
Pingtung County	269.1	33%
Nantou County	143.6	17%
Taichung City	116.5	14%
Chiayi County	87.4	11%
Kaohsiung City	66.8	8%
Yunlin County	56.2	7%
Tainan City	30.6	4%

#### Taiwan Agriculture Renews Concern Over Climate Change

The serious drought in 2020 compares only to another similar situation over 50 years ago but the past several years have also seen abnormally dry rainfall conditions and unusual typhoon patterns. As a result, Taiwan agriculture has joined other parts of the economy in considering the possible conditions that might result due to accelerating climate change, including as it relates to rainfall and water resources. Many climate models predict that Taiwan's fall monsoon rainfall patterns may change significantly in the future, in particular leading to fewer typhoons and less rainfall in the typically wet fall months. This could lead to more years that resemble the 2020/21 drought and leads experts to worry about chronic water storages in Taiwan's extensive reservoir network. This year also showed the importance of ensuring that water storage and distribution infrastructure is functioning well and not wasting a valuable resource.

2020/21 also brought the competition for water resources between agriculture, industry, and urban use into public view. The future division of those resources is under reconsideration by some as industry continues to grow to a dominant share of Taiwan's economy. Another key point of discussion in Taiwan related to this is water pricing. The main question is whether current pricing models used in Taiwan are leading to water prices that are too low and lead to misallocation of resources. Of concern to

agriculture is when the discourse revolved around whether irrigation water is the best use of this resource and whether greater emphasis placed on industrial and urban water use.

As Taiwan heads into the 2021 rainy season, everyone is hoping for a return to normal rainfall and additional time to consider these difficult resource allocation issues. Regardless of the result, this year has been a wake-up call and many experts across Taiwan are discussing how to address water resources as it relates to potential climate change impacts with renewed vigor and seriousness.

**Attachments:**

No Attachments.