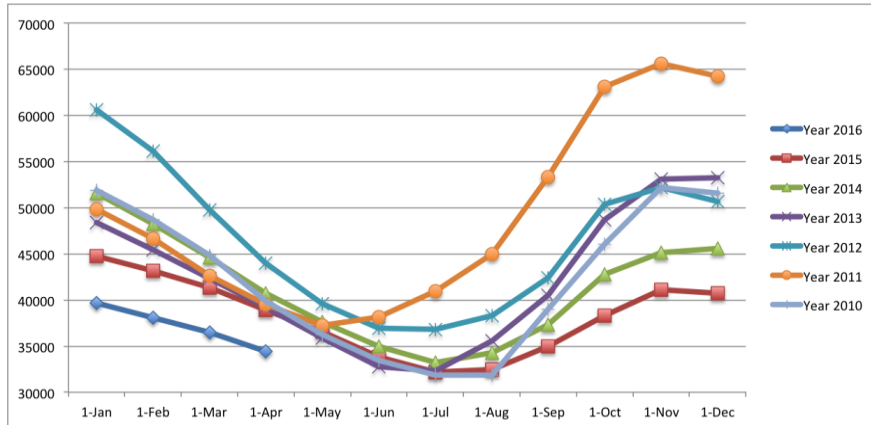


Figure 1. Dam water levels



Note: million cubic meters

Source: Royal Irrigation Department

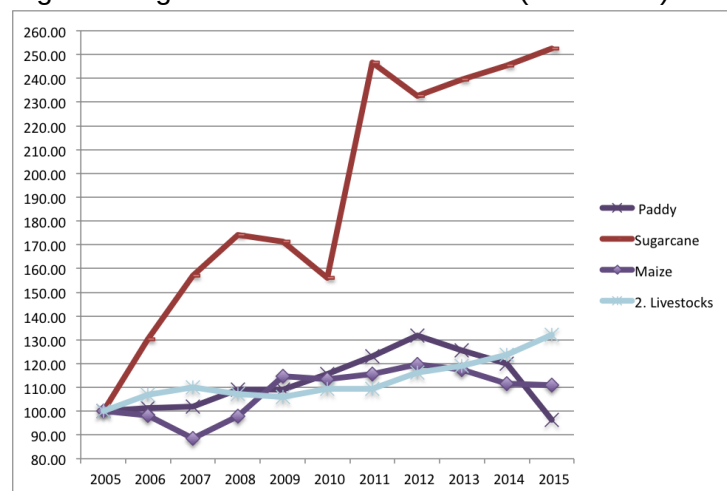
*In 2016, Thailand faces with the lowest level of dam water compared to that of many years ago. Some argues that we have been facing with El Nino effect, lack of rain or the so-called drought since 2014, and it became obvious in 2015 and was even worse at the beginning of 2016. This statement is also consistent with the graph provided above. Drought decreases soil moisture and increases evapotranspiration, water transferred from Earth's surface to the atmosphere. Since water is the main resource used for growing crops, when the country deals with shortage of water, El Nino effect, that is why it is inevitable to say that the farmers hurt the most.*

*Last year, the country faced with the off-season drought, which occurred in the middle of the rainy season. The average rainfall level was 46% under the average level and the total volume of dam water was only 45% of Thailand's reservoir capacity. During the rainy season, farmers expected to use rainwater to cultivate their crops, but unexpectedly, there was no rain at all. They needed to depend on dam water instead. Unfortunately, Royal Irrigation Department had to reduce daily water supply for agricultural sector by 25%, equal to 5 million cubic meters per day, in order to extend the length of water supply. Moreover, government recommended to delay the agricultural production due to water deficit from no rainfall and very low level of dam water such that farmers must significantly lower agricultural production in 2015 (Figure 5). However, the lower production led to the lower farmers' income. Accordingly, the alternative choice or the key survival is the changing to produce less-consumed water crops.*

*At present, the situation becomes even worse than before compared to last year. Based on figure 1, it is obvious that dam water levels are significant affected by the current drought. In other word, it means that the volatility in climate has an impact on water supply and eventually the farmers' income. Hence, farmers need to switch to cultivate less-consumed water plants and delay the normal crops that consumed a lot of water. For example, paddy is water consuming while sugar is not, therefore farmers tend to produce more of sugar instead, based on figure 2.*

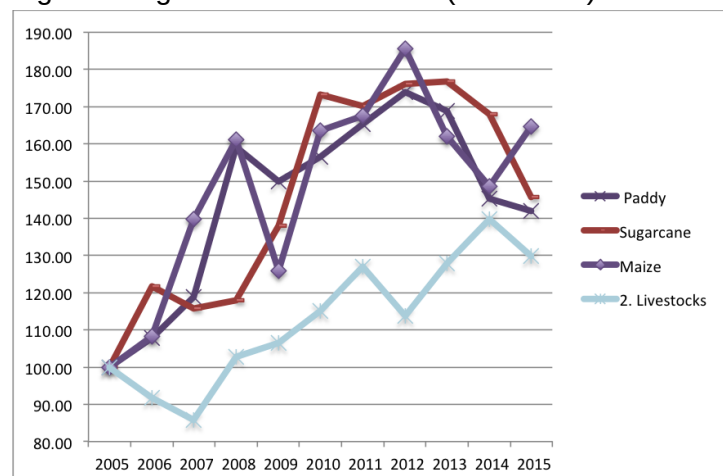
Despite the larger production, it does not always mean farmer will get higher revenues. *The excess production of sugarcane (less-consumed crops) drives its price down (figure 3), in which most of other less-consumed water plants also have the same directions of their prices with the sugarcane price in case if there is no derived demand.* For example, less-consumed water crops such as maize that has higher price due to higher production of livestock. Since we have an increasing trend of livestock such that its drive the demand for maize and causes its price to become higher. Larger production of livestock as well as higher cost of inputs will lead to lower price of that product and eventually lower farmer's profit margin. *In accordance with the fact that Thailand is the second largest rice producer, when rice production declines, rice price should increase. But, Thailand as well as other exporting countries have bulging stockpiles and try to release them to the world market such that it drives the rice price down. Consequently, farmers will not get income as much as prior since they need to suspend their production or switch to produce other crops, which have lower prices or profit margin and need some knowledge, skill, money and time to do so.*

Figure 2. Agricultural Production Index (2005=100)



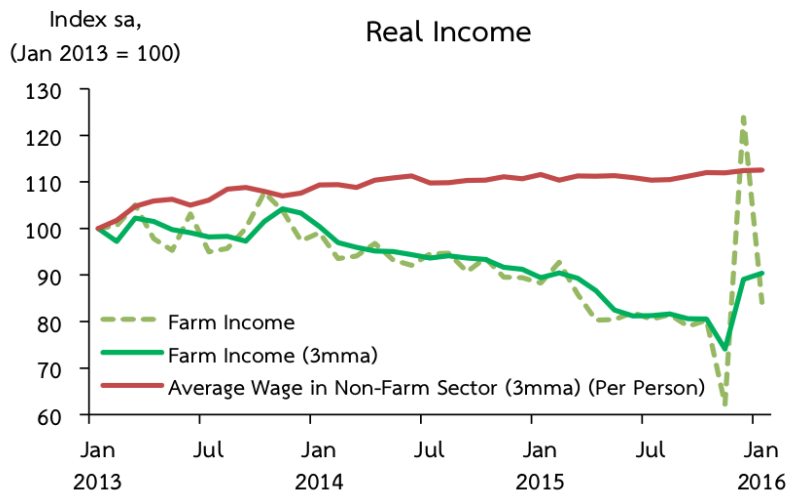
Source: Office of Agricultural Economics

Figure 3. Agricultural Price Index (2005=100)



Source: Office of Agricultural Economics

Figure 4. Real Income



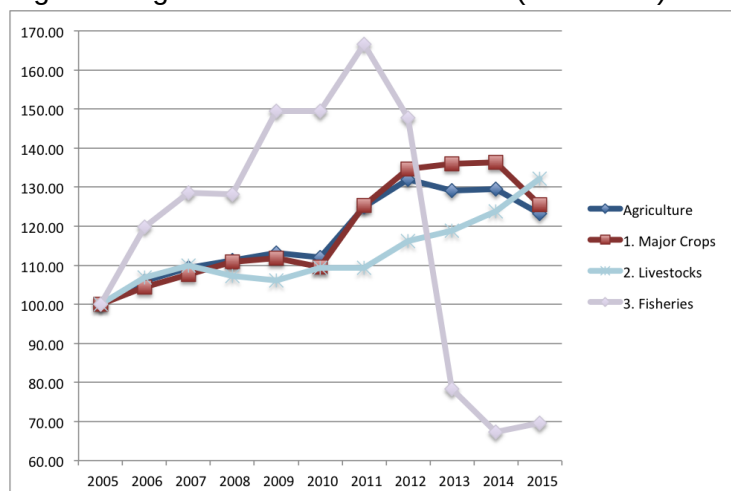
Source: Bank of Thailand

In 2011, prices of major crops reached the highest point, approximately 190, before it was declining until about 135 in 2015. The trend for both major crops and agriculture are in the same direction. When farmers perceived higher prices of agricultural products, they tend to increase those products in order to gain higher revenue. In fact, producers think the same way and tend to increase their productions at the same time, which result in lower agricultural prices in the future. As crops take some period of times to mature such that it does not affect prices immediately. The production was rising dramatically in the first year, 2011, and slightly after that while prices keep declining.

Unfortunately, there was a reduction of major crops production in 2015 with lower prices of agriculture. One implication for contraction of agricultural production is water shortage that provided earlier. In other word, it means farmers have higher cost of production. When supply becomes deficit, it means we have excess demand and prices should be increased but somehow we have lower prices. To clarify, we come up with one possible explanation, which is losing value of exporting. Even if the exports of agricultural products are not large compared to other exporting products, nevertheless farmers' income still got affected. Few years ago, the whole world faced with economic contraction especially for the countries importing our products such as China, United States, European Union, Middle East, and so on. Since many countries got affected from the crisis, then it decreased imports from Thailand. For example, lower oil price level attacked Middle East countries. Moreover, there is more competitiveness in the world level in agricultural production such that the importing countries will import from anywhere that offers the lowest prices. Although Thai agricultural prices have been declining over times but we

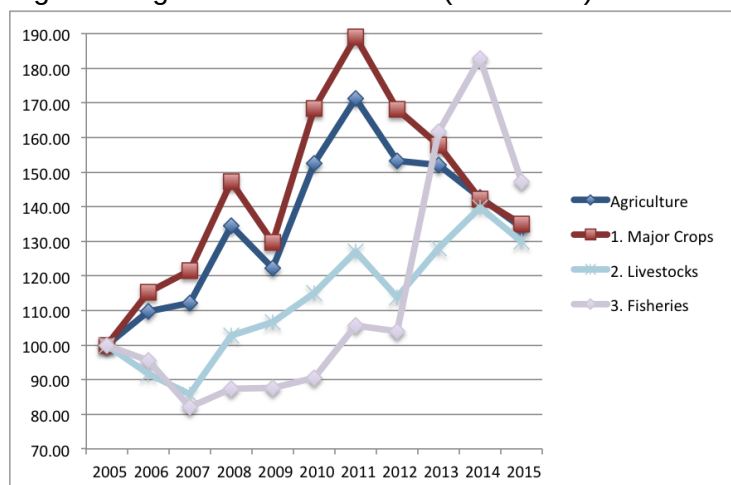
still cannot compete with other exporting countries due to one of the reason, that is, we have been facing with higher cost of production such as labor and drought.

Figure 5. Agricultural Production Index (2005=100)



Source: Office of Agricultural Economics

Figure 6. Agricultural Price Index (2005=100)



Source: Office of Agricultural Economics

Figure 7. Thai Agricultural Exports Index



Source: Bank of Thailand