

ENSO Country Reports

Regional Consultative Workshop on El Niño in Asia-Pacific

7-9 June 2016

Bangkok, Thailand

This document has been compiled based on inputs from countries that expressed their interest to contribute to the ENSO Country Reports during the **Regional Consultative Workshop on El Niño in Asia-Pacific** from 7 to 9 June 2016 in Bangkok, Thailand, co-organized by ESCAP and UNDP.

The countries that contributed to this report are **Cambodia, Fiji, Myanmar, Papua New Guinea, Philippines, Palau, Sri Lanka** and **Viet Nam**.

ENSO Country Reports

1. Viet Nam

1.1 Overview of El Niño impacts

Viet Nam has been experiencing impacts of El Niño associated climate variations, manifested in the form of increased local temperature and rainfall that has dramatically decreased since end-2014. These impacts are also the reasons behind drought and saltwater intrusion; both of which have significantly damaged and continue to threaten agricultural production and consequently the livelihoods of people.

The regions that have been significantly impacted include the Mekong Delta, the Central Highlands and South Central Viet Nam. Rice production, typically covering 40,000 hectares (ha) of land, was diminished due to water scarcity in the South Central region and Central Highlands in 2015. Moreover, 12,000 ha of agricultural land was exposed to drought, and thousands of households could not access clean water for domestic use. Low rainfall in 2015 was followed by low river flows and water storage in hydraulic and hydropower reservoirs. This led to drought and saltwater intrusion in the South East and South Central regions, the Central Highlands and in the Mekong Delta. Twenty-two provinces have already been affected by drought; eighteen of which have been severely impacted. It has been predicted that the impacts of events could be felt until mid-2016. The current status as well as measures being taken for drought and saltwater intrusion prevention and control in the South Central region, Central Highlands and Mekong Delta are expanded upon as follows.

a. South Central Viet Nam

In this region, the dry season started in December 2015, and is predicted to continue until the end of August 2016. Water supply for agricultural production and human consumption mostly comes from hydraulic and hydropower reservoirs, and currently the storage level of hydraulic reservoirs from the city of Da Nang to the city of Phu Yen is 60-80% of the designed capacity. In the provinces Khanh Hoa, Ninh Thuan and Binh Thuan, the storage level remains at 20-45% of the designed capacity. Hydropower reservoirs have the same or lower storage levels when compared with the same period in 2015. It is predicted that drought in this region could remain until the onset of rainy season in September 2016, with large-scale impacts and particularly severe impacts in Binh Thuan, Ninh Thuan and Khanh Hoa provinces.

b. Central Highlands and South East Viet Nam

The dry season stress in this region lasted till May 2016. Currently, hydraulic reservoirs are filled up with only 40-50% of their capacity, and the water level is decreasing, particularly when compared with the water level in 2015. Nearly 200 small water reservoirs have dried up, and most of these reservoirs will be unable to supply water sufficiently for the final period of the Spring-Winter crop year (Summer-Autumn, and seasonal farming takes place during the rainy season). Drought was predicted to occur in these regions with small reservoirs or without irrigation projects in relatively large areas.

c. Mekong Delta

The water levels in in this region have been the lowest since the past 90 years, owing to the fact that the rainy season arrived late and ended in early 2015, and due to the lack of upstream flow from the Mekong River. This caused saltwater intrusion to occur nearly two months earlier than normal – expanding to 90 km in 2016.

This is the first time such an event has occurred in the history of monitoring saltwater intrusion. Saltwater intrusion impacted agricultural production and human life till the first rainy season in around June 2016. It adversely affected the economy and human life in 10 out of 13 provinces in the region (Long An, Tien Giang, Ben Tre, Tra Vinh, Soc Trang, Bac Lieu, Kien Giang, Ca Mau, Hau Giang and Vinh Long).

1.2 Overview of the current drought condition

In total, about 358,800 ha of plantations have been affected by drought and saltwater intrusion; specifically 3,900 ha in South Central Viet Nam; 96,700 ha in the Central Highlands; 230,600 ha in the Mekong Delta; and 27,600 ha in Binh Phuoc Province. Additionally, rice production in 25,900 ha of land diminished due to water scarcity (15,400 ha in Binh Thuan; 5,800 ha in Ninh Thuan; 1,800 ha in Khanh Hoa and 2,700 ha in Gia Lai).

Currently about 400,000 households with about 2,000,000 people in the Mekong Delta, Central Highlands and South Central Viet Nam face water scarcity for domestic use, and about 1.1 million people in drought-affected areas suffer from food scarcity and require food relief. Due to the impacts of water and food scarcity, an estimated 27,500 children and 39,000 women are malnourished. Moreover, water shortage and the use of unsafe water have increased the likelihood of outbreaks of water-related diseases. Around 400,000 people are suffering from the incidence of water-borne disease.

Drought for extended periods of time is affecting agriculture adversely, as it leaves crops dehydrated with increased salinity – resulting in a decrease in productivity, thereby displacing the livelihood of more than 1.75 million people across 18 provinces.

1.3 Prevention and control measures

a. Directed activities

To confront drought and saltwater intrusion in 2016, the Government, Prime Minister and Standing Office for the National Development Planning Commission have issued a number of directions and regulations as directive Official Orders. They have chaired workshops and organized local site-visits to directly supply concrete guidance for drought, saltwater intrusion prevention and control activities.

Local communities have received funds for drought, saltwater intrusion prevention and control activities in 2016; amounting to about 1,000 billion Viet Nam Dong. The support content includes electricity cost, oil for water pumps, dredging for inlets and canal systems, water trucking for domestic use, undertaking emergency repair services, extended supply of water pipes, and plant varieties, and animal breeds for rehabilitation of production.

b. Emergency measures requiring early implementation

Emergency measures include providing support for affected residents to ensure their acute needs are met (i.e., food, water and healthcare), preventing lack of food and water, incidence of diseases, and the closing of schools during long-term periods of drought. There is also a need to actively implement measures to ensure water is available for domestic use, to use mobile vehicles to truck water for domestic use, to provide water storage containers and water supply equipment for households in areas without centralized clean water supply projects (i.e., plastic water containers, household water filters and water treatment chemicals), to lengthen pipelines of centralized clean water supply projects in order to widen supply coverage, and to drill deep wells to temporarily replace saline groundwater.

Information regarding drought and saltwater intrusion needs to be monitored, provided and projected to the

concerned stakeholders. Communication and experience-sharing on the topic of active drought, saltwater intrusion prevention, and effective water needs to be fostered. Agricultural production in the seasons of Winter-Spring, Summer-Autumn and Autumn-Winter in 2015-2016 needs to be more geared towards changing cropping time, plant varieties and animal breeds. Furthermore, steps need to be taken not to cultivate agricultural lands without sufficient water supply.

The Government has recommended regular review of the demand for water usage and water sources stored in hydraulic and hydropower reservoirs needs to be conducted. A suitable water usage plan, one that is adjusted for the changes in the weather patterns of 2016, needs to be developed. Direction on operating reservoirs to supplement water for downstream areas during dry periods needs to be given to prioritize water for domestic use, animal consumption, and irrigation for perennial crops with high economic value.

Implementation of suitable measures specific to particular areas – such as asking locals to collect, store water and prevent salinity – needs to be undertaken. Prevention of excessive salinity can be undertaken via methods such as canal dredging, installation of mobile pumping stations to supply water for canals and fields when water is available, dam construction for salinity prevention, digging of ponds and wells, as well as underground water well drilling. Construction of irrigation projects in regions with high-risk of drought and saltwater intrusion to supply water for agricultural production and human life needs to be fostered and executed. Additionally, in order to help people affected by drought and saltwater intrusion, policies supporting debt-rescheduling, debt-freezing, and risk treatment for local households need to be implemented. Projects for product rehabilitation and development need to be funded and regulated. Coordination between countries upstream and downstream of the Mekong River needs to be bolstered to facilitate upstream operations of their water reservoirs and to closely monitor water discharge of upstream reservoirs, and water collection for the Mekong River Delta.

c. Long-term measures

Long-term measures to manage and mitigate adverse impacts of scenarios such as the onset of El Niño events would include continuation of monitoring, forecasting and updating climate change scenarios. This would require enhancing national capacity for water and saltwater intrusion monitoring, forecasting capacity to update information in time, and actively deploying adaptation activities in particular periods of extreme weather impacts.

Additionally, the long-term socio-economic development plans of local provinces in the Mekong Delta and the South Central and Central Highlands regions need to be reviewed and adjusted to adapt to the effects of climate change and specific climate events such as El Niño. In the meanwhile, it is recommended that updates and adjustments can be made to sector development master plans – particularly plans for land use, irrigation, agricultural production and water supply to adapt to climate change with more severe drought and saltwater intrusion. Measures to restructure agricultural production towards changes in crops, varieties of breeds, plants and aquatic products, in association with water sources to ensure economic value and social security, also need to be undertaken. The Government recommends the need to develop specific incentive policies allowing people to acquire modern water-saving technologies and practices; such as shallow-exposed dry irrigation, water sprays and drip irrigation etc.

Administrative and economic measures to raise awareness of the need to save water for individuals and groups via calculation of water price increase for socialization in production, supply of water for domestic use, and avoidance of water waste and loss, also needs to be undertaken. In addition, forest protection, foster forest development and rehabilitation (particularly upstream protection forest to improve water sources), and

environmental protection needs to be enhanced. Prioritizing irrigation construction investments is also important; particularly for drought and saltwater intrusion prevention. The total investment capital demand is estimated at US\$ 1,415 million, of which the most urgent project which started in 2013 is valued at US\$ 233 million. Long-term investment for 2017-2020 is estimated to be US\$ 1,182 million.

d. Country-specific needs

To effectively confront continuous drought and saltwater intrusion in South Central Viet Nam, the Central Highlands and the Mekong Delta, the Ministry of Agriculture and Rural Development (MARD) of Viet Nam has proposed the implementation of emergency humanitarian support for drought and saltwater intrusion-affected population, and to deploy measures for drought, saltwater intrusion prevention and control activities. They aim to do so by supporting water trucking, water treatment supplies, providing water storage containers, supplying hygiene kits to poor and vulnerable women, and improvement of school sanitation conditions. The Ministry aspires to provide food or cash for food for households facing starvation, to provide animal feed and seeds for poor households to replant their fields. They also support provision of therapeutic foods and micronutrient supplements to reduce malnutrition at the community and hospital level (27,500 children); particularly provision of micronutrient supplement for pregnant (39,000 people) and lactating women.

The Ministry also aims to provide commune health centres, district hospitals and other medical facilities with essential medicines and medical supplies. Furthermore, they wish to strengthen monitoring capacity of provincial preventive medicine centres and support the capacity of health facilities for maintaining daily health services. In terms of agriculture, they aim to clean crop lands affected by saltwater intrusion, to supply water for drought and saltwater intrusion severely affected areas, and to restock animals for poor households in severely affected areas. The Government also hopes to provide ODA loans for drought and saltwater intrusion adaptation projects in South Central Viet Nam, the Central Highlands and Mekong Delta and finally to support institutional drought, and saltwater intrusion management capacity development.

2. Fiji

The El Niño associated climate variations in 2015-16 created significant challenges for Fiji, in that it caused both increased cyclonic activity and prolonged severe drought due to receipt of below average rainfall in recorded history. However, during its wet season, Fiji experienced one of the strongest cyclones, Cyclone Winston – a Category 5 cyclone – which affected thousands of people.

The Government of Fiji responded to El Niño related slow-onset events by advising farmers to plant drought-resistant crops, use diesel powered generators to supplement hydro-electric power generators, and also provide water for over 67,000 people using water trucks and barges. Emergency relief aid was provided by neighbouring countries to help tackle the impacts of Cyclone Winston. The Government also set up evacuation sectors, distributed food rations, clothing, medical supplies, drinking water and tents. Vegetable seeds were given to affected farmers and a state of emergency was declared in order to rebuild Fiji.

While global forecasts from the World Meteorological Organization (WMO) predict a weakening of the El Niño phase with the gradual shift towards “mild La Niña” conditions in the latter half of 2016, it is important to note in hindsight that rainfall data collected from weather stations (Figure 1) across Fiji for the period May-July 2016 clearly show continuing adverse impacts of the El Niño cycle. Only 2 out of about 30 weather stations have reported average rainfall data, with an overwhelming number reporting below average or well-below average rainfall. However, as predicted by WMO, and based on informal observations, significant

rainfall was observed throughout the Fijian group of islands in August, signifying the shift towards the La Niña phase.

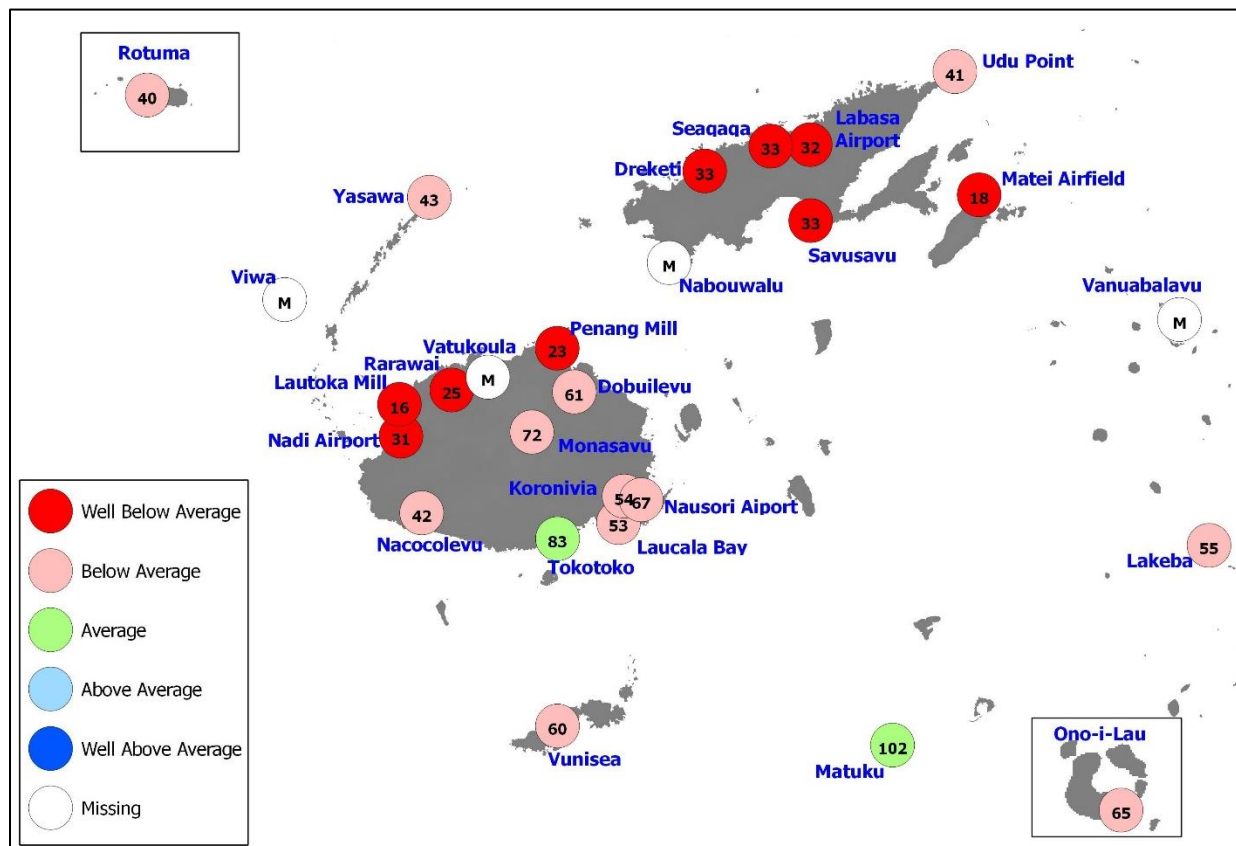


Figure 1: Rainfall data for Fiji for the period May-July 2016

In responding to the crisis, Fiji recognizes that it requires the drafting of a drought plan and a response plan. Significant investments, estimated at around F\$300m (USD 150 million; or roughly 10% of the FY budget) in improving water and sanitation infrastructure has also been included in the new fiscal budget with funding support from Asian Development Bank (ADB) loans and grant funding from the Green Climate Fund (GCF).

In terms of pre-planning and improving advocacy towards drought preparedness, it has been observed that the status of drought-onset is determined primarily by recent rainfall data and trends. While annual and bi-annual projections are released by the Fiji Meteorological Services, weak inter-sectoral coordination negates the possibility of proactive actions designed to assist communities most at risk. This reflects the need for Fiji to not only keep pace with new and emerging technologies, but to also ensure that internal capacities are fully utilised to support Government efforts in minimizing losses and expanding the economic base. There is also a need for enhanced capacity in terms of equipment and manpower for disaster risk reduction and mitigation, greater access to technology, ability to retain trained personnel, and encouragement of both inter and intra-regional cooperation. The Government of Fiji has recently completed the post-disaster needs assessment related to Tropical Cyclone Winston, and a disaster recovery framework has been tabled for cabinet approval.

3. Philippines

The Philippines experienced increased losses in the years when there was an onset of a strong El Niño event. In the year 2015-2016 alone, the Philippines experienced an US\$ 11.45 billion production loss, which amounted to a loss of 790,239 metric tonnes of produce; a figure that was significantly higher than years with a mild or no El Niño onset. The Philippines created the Roadmap for Addressing the Impact of El Niño (RAIN) to respond appropriately to the crisis at hand, in which it identifies four fields that are most vulnerable to impacts of El Niño events. These are elaborated upon as follows.

Food security is the first area that is impacted by El Niño-induced drought. The production losses during El Niño years indicate reduced food production, which increases food prices, but decreases farm income. Emergency Food Security Assessment data (2016) reflected the direct effects of drought on food security, livelihoods and nutrition of people in affected areas. Drought leaves farmers unable to plant crops, and the proportion of rice and corn farmers able to cultivate their lands dropped as the year went by from 78% to 7%. A similar trend was observed amongst vegetable farmers. Moreover, 77% said water for irrigation was no longer sufficient, and 61% said that water for livestock consumption was not enough. Plans to combat this include improving production support for *palay* (pre-husked rice), corn, livestock and fisheries in areas that would not be severely affected by the El Niño. It also includes increasing credit and technical support available for farmers. Investing in alternative livelihoods and sources of income, such as for example, cash-for-work, handicrafts etc., can enhance income diversification, thereby improving conditions for farmers who were expected to be devastated due to poor yield. Food supply can be improved by increased imports and Government interventions to monitor prices and improve food distribution.

The second field that will be impacted by drought is energy security, as increased drought is common for El Niño events, which can result in reduced hydroelectric power generation. This was expected to be more pronounced in Mindanao Islands, because of the bigger share of hydroelectric power in its energy mix. This can be better managed by implementing an interruptible load programme, by deploying modular generator sets, and by optimizing the dispatch protocol for power plants with hydropower plants serving as peaking power plants that are typically only run when there is a high demand for electricity.

The third field impacted by drought is that of health. Drought results in decreased drinking water, which along with the prevalence of communicable diseases, can result in negative health impacts. This has particular bearing on health; with only 3 in 10 lactating mothers being able to adequately breastfeed their children as they did before the drought, and only 11% of the women being able to consume more than 3 meals a day. 44% of lactating women are consuming three full meals, and 42% consume less than 3 meals a day. In order

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