

# Expectation of the Benefits of Plant Variety Protection for the Agriculture and Plant Breeders in Lao PDR

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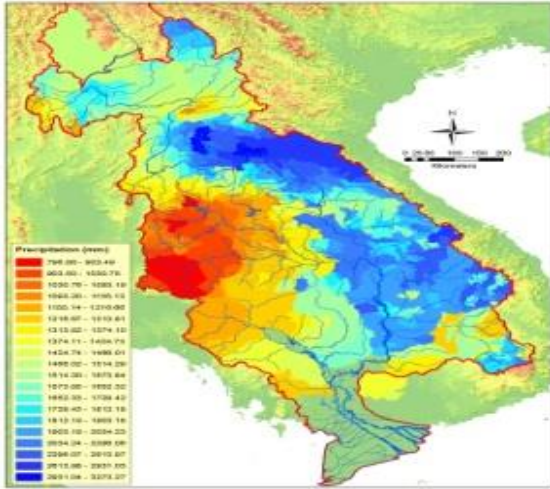
# 1. Introduction

- One of the national research priorities is to improve the efficiency of the current breeding and variety testing program in order to accelerate the introduction of better varieties for farmer's adoption.
- Rice breeding program in Laos was established at Rice Research Center in 1991, in collaboration with IRRI, and supported of funding by the government of Switzerland.
- From 1991 to 1998, most of the breeding lines were introduced from IRRI, Philippines and from Thai-IRRI program.
- Climate changes affects direct to rice production worldwide, including Laos and causes Nation Rice Production fluctuates from 20 to 30%.

# 1. Introduction (Cont.)

- Flood and drought are offence comes one after the other (some year early drought occurs and follow by flood and some year flood occurs than follow by terminal drought.
- In 2018, flood destroyed rice field and cause production losses in the country up to 40%, where terminal drought affected yield lose of late maturity varieties up to 20%.
- Insect pest (Brown and Green leaf hopper) and diseases (Blast and Bacterial leaf blight) damage rice plant observed more frequency.
- Since 2007, NAFRI has setting up breeding program to develop new climate resilience rice varieties that expects to alleviate production losses due to climate resilience.

# Climate resilience



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## 2. Rice Breeding Program in Laos

- Since 1991, we imported in total 1,127 of F2 population from IRRI and Thai-IRRI, of which 4 varieties were released as TDK and PNG.
- Total of 64 fix lines imported, 13 were released as TDK, TSN, PNG and NT.
- First cross made by Lao breeder was done in 1994 (DOK TIOU/TDK1).
- So far, total of 520 crosses were done, 8 lines/crosses were released as TDK and TSN.
- First two varieties (TDK1 and TDK2) were released in 1993, since then rice productivity was increased significantly and reached self sufficiency in 2000.



### **3. Breeding Program for climate resilience rice varieties**

#### **1. Breeding for flood tolerance program.**

- Collaboration with BIOTECH center, Thailand; IRRI, ACIAR and IAEA.

#### **2. Breeding for drought tolerance program.**

- Collaboration with BIOTECH center, Thailand; IRRI and ACIAR.

#### **3. Breeding for pest and disease tolerant program**

- Collaboration with BIOTECH center, Thailand, JIRCAS, IRRI and IAEA.

## 4. Goal of the breeding

1. High Yield.
2. Tolerance to biotic (pest) and abiotic (flood, drought) stress.
3. High milling yield.
4. Excellence cooking and eating quality.
5. Adoptability to climate resilience.
6. Photoperiod insensitivity, short maturity for dry season rice to save water and suit for mechanization.
7. Photoperiod sensitivity, flower in early October for direct seeding (broadcasting and seed drill) in wet season to save labour cost.



# Breeding for submergence tolerance



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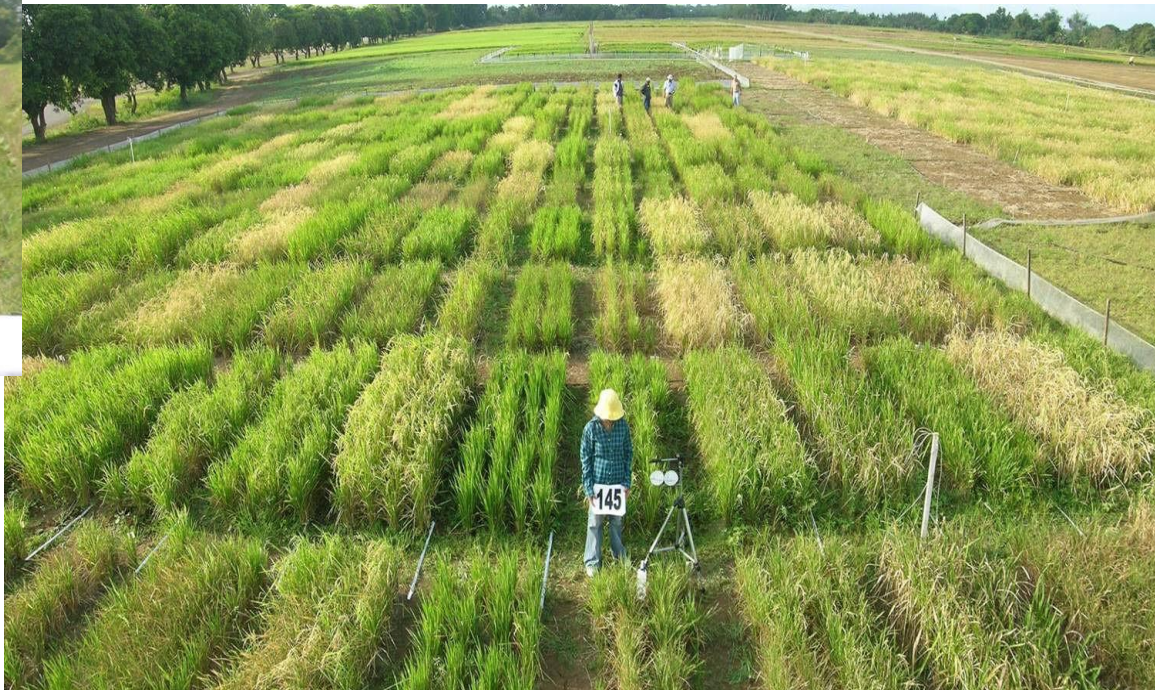
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- Need 6-10 years to develop new variety



# Breeding for drought tolerance and Aerobic varieties





# Breeding for direct seeding, lodging resistant





# Breeding for mechanization harvesting, shattering resistant

