UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

CAPSA
Centre for Alleviation of Poverty through Sustainable Agriculture

Disaster Resilent Agriculture

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Type of Disaster in Agriculture

- Weather related- disasters: Drought, Flood, Extreme Temperature
- Volcano eruption
- Hurricane

FAO (2015)

- Agriculture; 22 % of total economic loss due to disaster

2003 -2013

- USD 70 billion ---crop and livestock production losses
- 83 percent of crop and livestock production losses are caused by drought (44 percent) and floods (39 percent).

Impact of Disaster

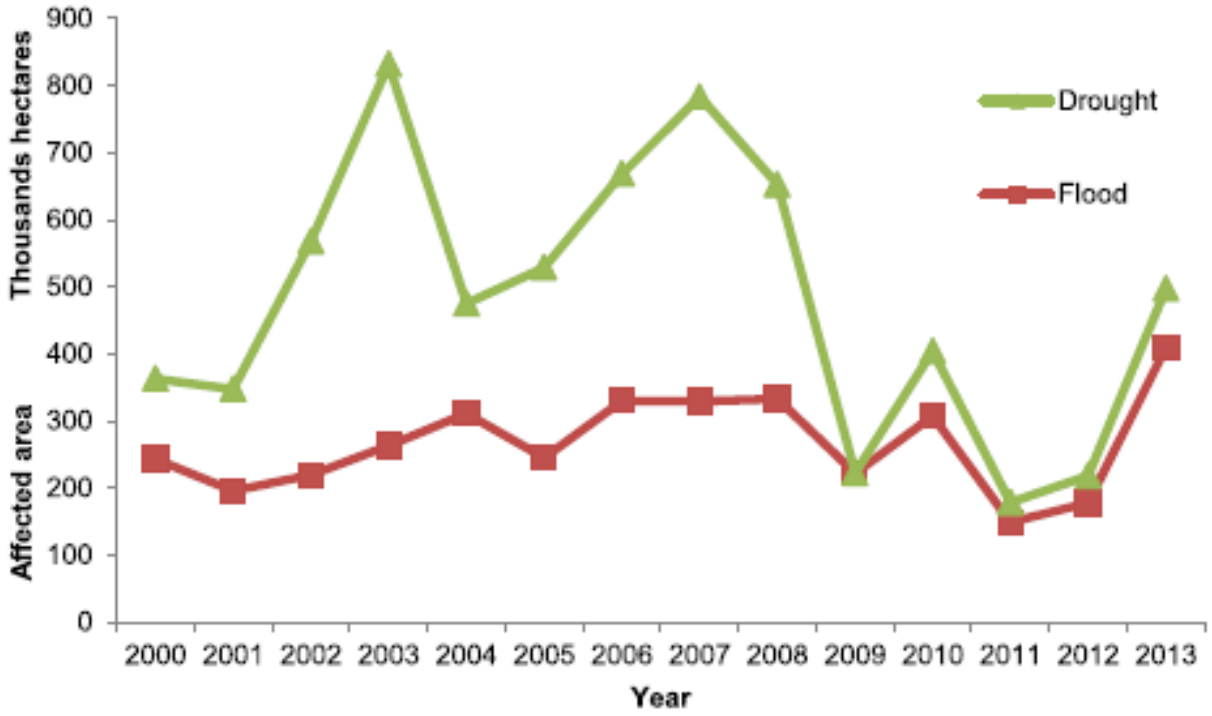
- **Direct Impact**
  - Physical damage
  - Harvest failure

- **Indirect Impact**
  - Pests and Diseases

    rice- brown planthopper– after flood

    rice – blast diseases - drought
  - Declining productivity after drought--- coconut – 2 years

Paddy Area Affected by Drought And Flood in Indonesia (2001-2013)



Source: Pusdatin, 2014; Balitbang Kementan, 2011

Agriculture Resilience

- United Nations International Strategy for Disaster Reduction, resilience is “The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions”.
- Resiliency exhibits two properties :
  - Capacities to resist and recover
- Ecological Resilience
- Social Resilience

Ecological Resilience

- Species/Genetic Diversity
- Landscape Diversity
- Plant health
- Rich of Interaction
- Balance--- Nutrient Cycling

Plant types and cultivation react differently to volcano ash rain Mt Kelud, East Java, 2014)

Clove trees show mild ash injury – pinsple severe indury

Strategy for Increasing Ecological Resilience

- Increasing species and varieties diversity
- Adaptive varieties-species
- Increasing soil organic matter
- Increasing soil cover: cover crops and mulch
- Applying microbial technology
- Combination

Cases: Bio - IPM

- Straw/organic matter ammendment
- Superior PGPR (plant growth promoting rhizonacteria) application
- Optimizing NPK fertilizer
- Zero pesticide uses

Paddy rice- Drought

Cepu – Blora- Central Java 2009- drought
Subang – West Java – 2015- drought
Reduced Pump -water Irrigation Freq. 9 x → 3 x (67 %) – COST REDUCTION

Chilli Pepper- Drought

Cibatok- Bogor- 2009- field trials:

- Extensive rooting system
- Increase water holding capacity

	Wilted Plants (%)
Conventional	73.4
PGPR+organic fertilizer	28.5

Ecological Agriculture in Cepu, Blora 2009

Biointensive - IPM

Productive tillers: 33
Stem borer : 17 %
Yield 11.5 ton/ha

Conventional

Productive tillers: 17
Stem borer : 26 %
Yield 6.6 ton/ha

Social Resilence

- Effective community organization
- Effective government organization
- Socially self-organized conforming configurations based on needs and aspirations
- Highly autonomous – relatively independent from other area
- High levels of cooperation and exchange
- Community honours legacy and uses traditional knowledge and practices as well as local germplasm
- Human capital developed and capable of mobilizing resources through social networks

Mobile plant clinic – institutional innovation in services

Assessing damage, rapid laboratory service and consultation for recovery of Mt Kelud - eruption (East Java – 2014)

Strategy

- Capacity building of farmers: Farmers Field School
- Increasing social cohesiveness
- Optimizing relation- famers- government
- Innovative services

THANK YOU