Stage 2: Pest Risk Assessment Probability of Establishment

IPPC

CAHFSA
CARIBBEAN AGRICULTURAL
HEALTH & FOOD SAFETY AGENCY
AN INSTITUTION OF THE CARIBBEAN COMMUNITY

<u>Stages</u>

- Stage 1: Initiation
- Stage 2: Pest Risk Assessment
  - Step 1: Pest Categorization
  - **Step 2: Assessment of the Probability of Introduction (entry, <u>establishment</u>) and Spread**
  - Step 3: Impacts
  - Step 4: Overall Assessment of Risk
  - Step 5: Uncertainty
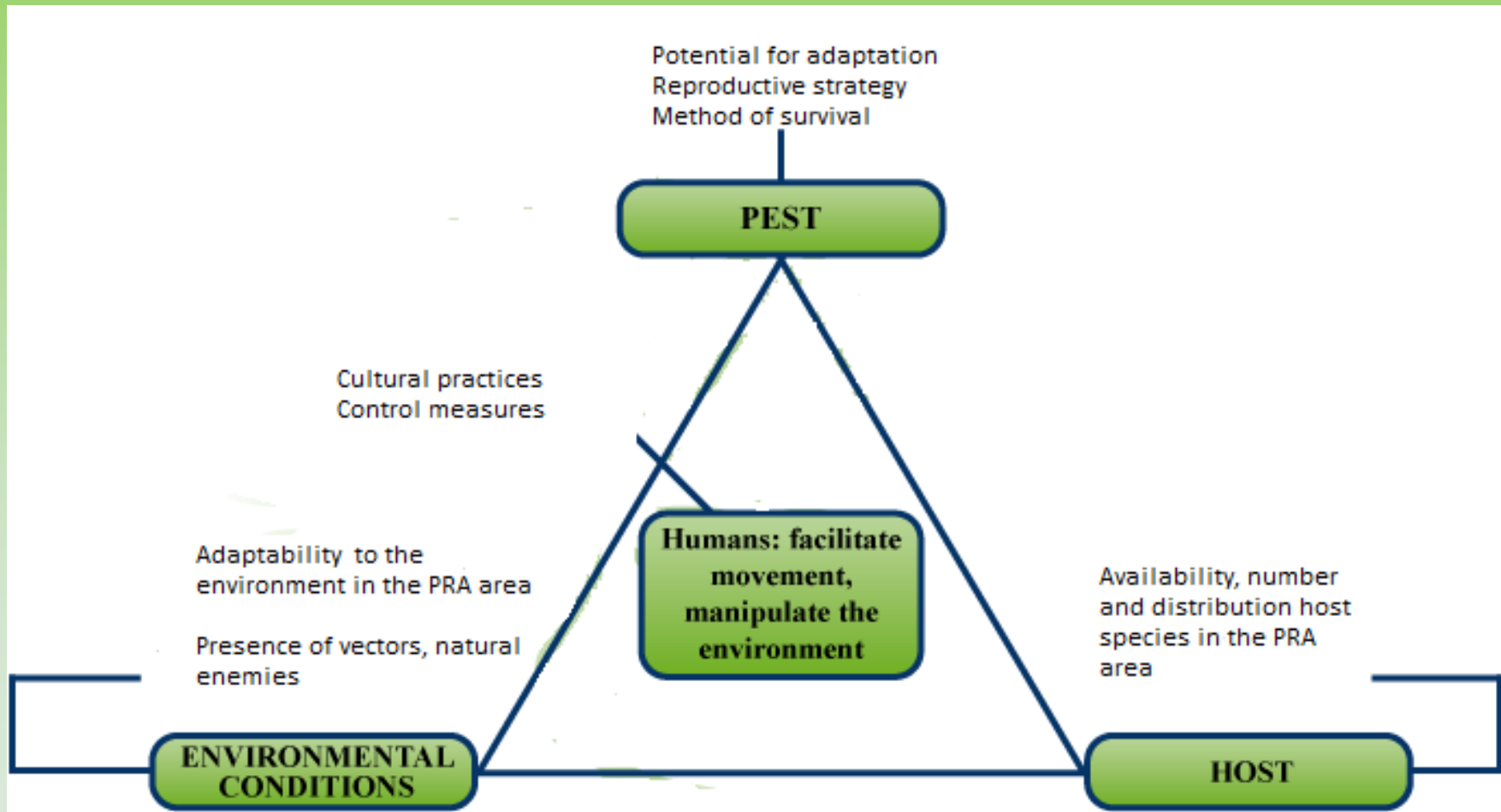- Stage 3: Pest Risk Management

Establishment

- Perpetuation, for the foreseeable future, of a pest within an area after entry   (ISPM 5, 2007)

Epidemiological Triangle

Probability of Establishment

- Evaluating the probability of establishment essentially involves considering information about a pest's biology and conditions in its current area of distribution, and then comparing that with the conditions present in the PRA area.

Probability of Establishment

- We can think about assessing the probability of establishment in three steps

- Three areas of the triangle
  - Pest information
  - Environment information
  - Host information

Host information

- Are hosts & alternates present?

- Are habitats available for pest plants?

- How likely is the pest to find hosts? Are they abundant?

- Are hosts present in the vicinity of expected entry points?

Pest information

- Is the pest adaptable?
- Has it been introduced elsewhere?
- Can it adapt to different climatic or other environmental factors?
- Can the pest seek out hosts? Is it mobile?

Pest information

- How does the pest reproduce? Does it have a high reproductive capacity?

- How does it survive adverse conditions?

- Does it require an alternate host or a vector?

<u>Vector information</u>

- Is a vector required for dispersal of the pest?
  - Is it present in the PRA area?
  - Is it likely to be introduced?
  - Are other potential vectors available?

Climate information

- Does the climate in the PRA area differ from that where the pest occurs? How?

- What climatic factors are critical for the pest's success? What climatic factors, if any, are limiting?

- Is the climate suitable for the pest? Will it be able to survive? Will it be able to reproduce?

Climate information

- Precipitation
  - Rain, snow, fog ….

- Temperature
  - Seasonal highs and lows, temperature extremes …

- Seasonal variation

Other environmental information

- Soil
- Hydrology
- Vegetation
- Prevailing winds
- Day length
- Species interactions

Cultural practices and control measures

- Compare cultivation practices of host crops in the area of origin and PRA area
- Would existing practices mitigate risk?
- Are there any pest control programs or natural enemies already in the PRA area?
- Are suitable methods for pest control or eradication available?

Other factors

- Reproductive strategy and method of pest survival
  - Self-crossing
  - Duration of life cycle
  - Generations per year
- Genetic adaptability
- Minimum population needed for successful establishment

Tools for predicting establishment

- Plant hardiness zone maps
- Climate maps
- Climate-matching models
- Bio-climatic models

- Fit for purpose
- Science-based
- Transparent