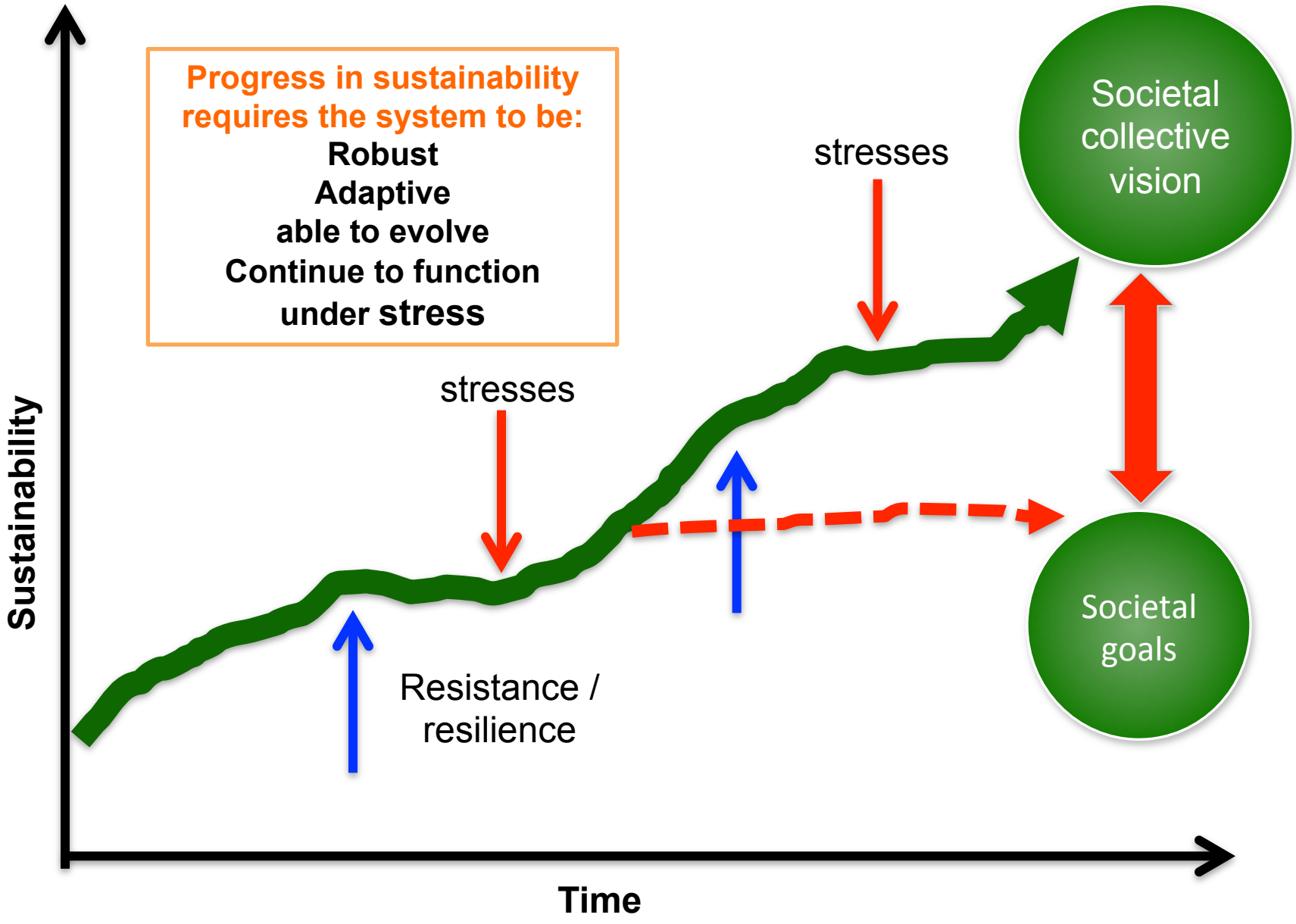
Sustainable agriculture under uncertainties and risks

Upali Wickramasinghe
Regional Adviser on Poverty Reduction and Food Security
ESCAP-CAPSA

Current threats to food system

- double squeeze
  - Rapid growth in demand
  - Deteriorating natural resource base
- double seesaw
  - Climate change → capacity to produce food by using even the existing natural resource basis is unpredictable
  - Market volatility due to panic buying and speculation
- food system cannot absorb this double squeeze and double seesaw → agriculture is under stress
- Approaches to food security based solely on production are inadequate

Trajectory of a sustainable agricultural system



Agricultural sustainability

- “development that meets the present without compromising the ability of future generations to meet their own needs.” World Commission (1987)
- “ability to provide for core societal needs in a manner that can be continued into the indefinite future without unwanted negative effects - National Academy of Sciences, USA
- Four key societal goals
  - Satisfy human food, feed, fibre needs
  - Enhance environmental quality and the resource base
  - Sustain the economic viability of agriculture
  - Enhance quality of life for farmers, farm workers and society
- Sustainability is not a particular state, but rather a process that moves farming systems along a trajectory towards greater sustainability on each of key goals

Qualities of systems moving to sustainability

- Work with natural ecological and biological processes and cycles to:
  - Maximize synergistic interactions
  - Maximize beneficial use of internal resources
  - Minimize dependence on external inputs
- Close nutrient, energy and other resource cycles to the maximum extent feasible to reduce undesirable losses and waste disposal to the system
- Work with social, cultural, and economic goals of people and institutions throughout the farm and food chain → improves synergistic relationships in social / economic realm and increases desired outcome of investment

Adaptability

- Farming risks [Environmental (temperature, rainfall, wind); Biotic (pests and diseases); Markets (fluctuating commodity and input prices); Consumer demand; Social conditions (labour availability, policies); Climate change]
- Adaptability [ability of a system (biophysical or human) to evolve and change in response to long-term changes] depends on:
  - Resilience: capacity of a system to absorb a spectrum of shocks and still retain and develop the same structure
  - Resistance: ability of a system to resist
  - Capacity of self-organization
  - Learning
- → Robustness of a farming system thus depends on farmers' access to resources (capital & labour), social institutions and networks

Approaches to continuous improvement

- Incremental
  - Expansion and enhancement of on-going efforts to improve farms, irrespective of size and farming systems
- Transformative
  - Develop a collective vision
  - Develop of new frameworks (e.g., legal) to support sustainability
  - Pursue research and extension
  - Identify and researching new forms of production systems
  - Identify systems that are resilient
  - Consider at landscape level on sustainability

Understanding key drivers of change

- Markets
- Public policies (incentives / disincentives)
- Farmer / consumer preferences
- Resources
- Land-tenure arrangements

Understanding key opportunities

- Stock management
- Regional cooperation
- International guarantees
- Global trade

Evaluating an agricultural system