Agriculture & Climate Change Adaptation

Livia Bizikova and Ruth Waldick and Patricia Larkin
lbizikova@iisd.ca

Climate Impacts

- Early assessment of climate change impacts on agriculture
- Introduction of the coping range in the early 1970s
- Planned versus autonomous adaptation in agriculture

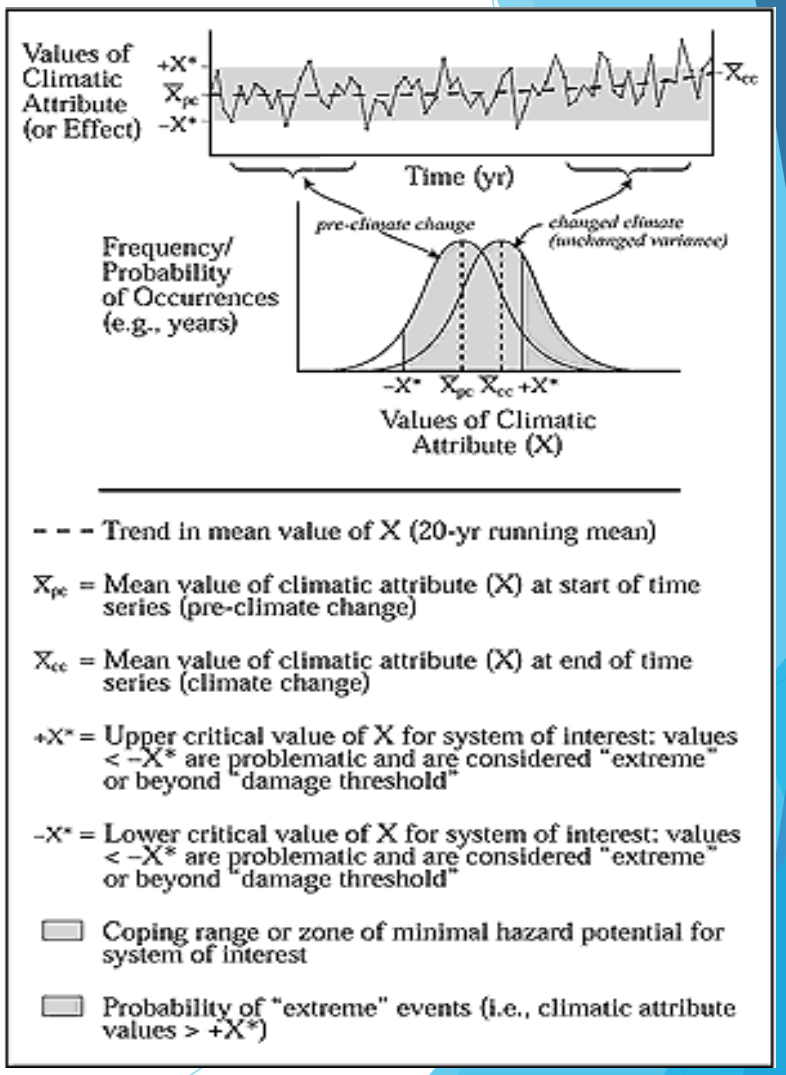
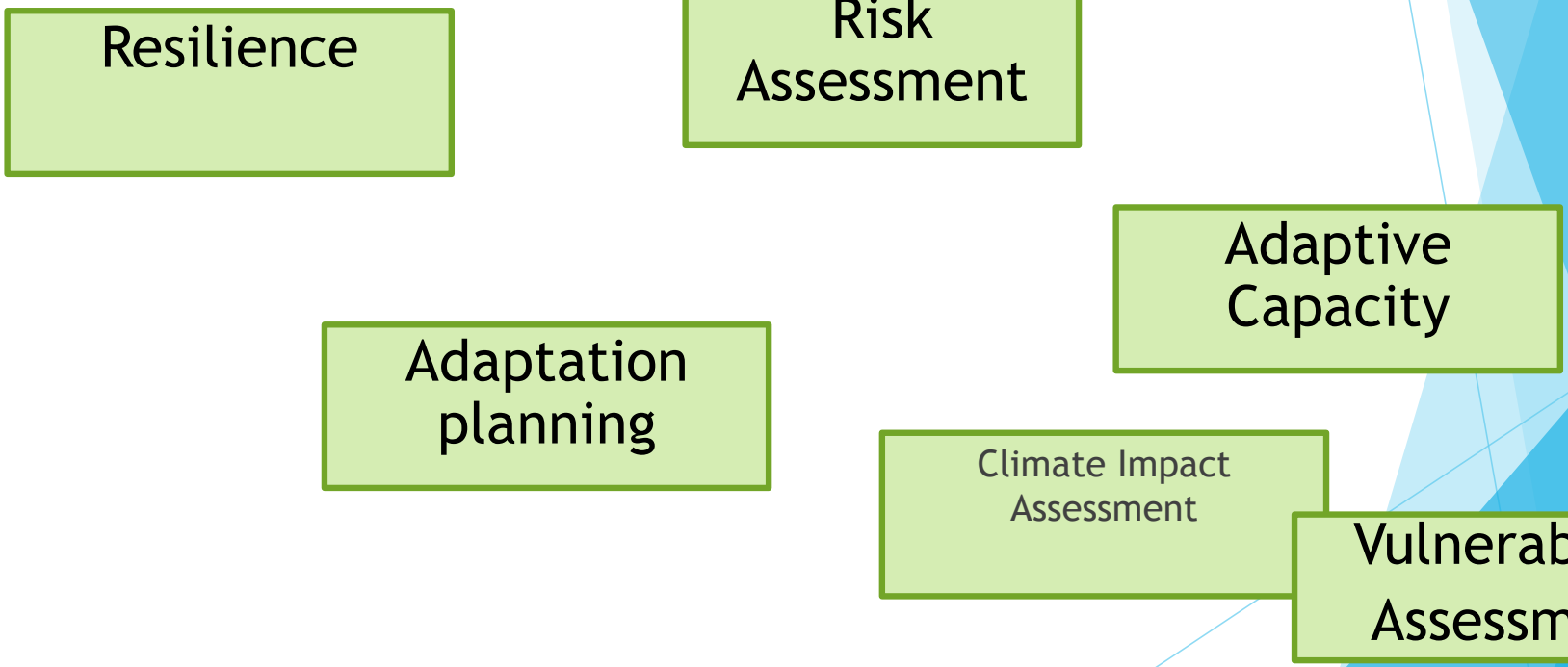


Figure: Climate change, variability, extremes, and coping range (after Hewitt and Burton, 1971; Fukui, 1979; Smit et al., 1999; and others).

Evolution of Responses to Climate Change



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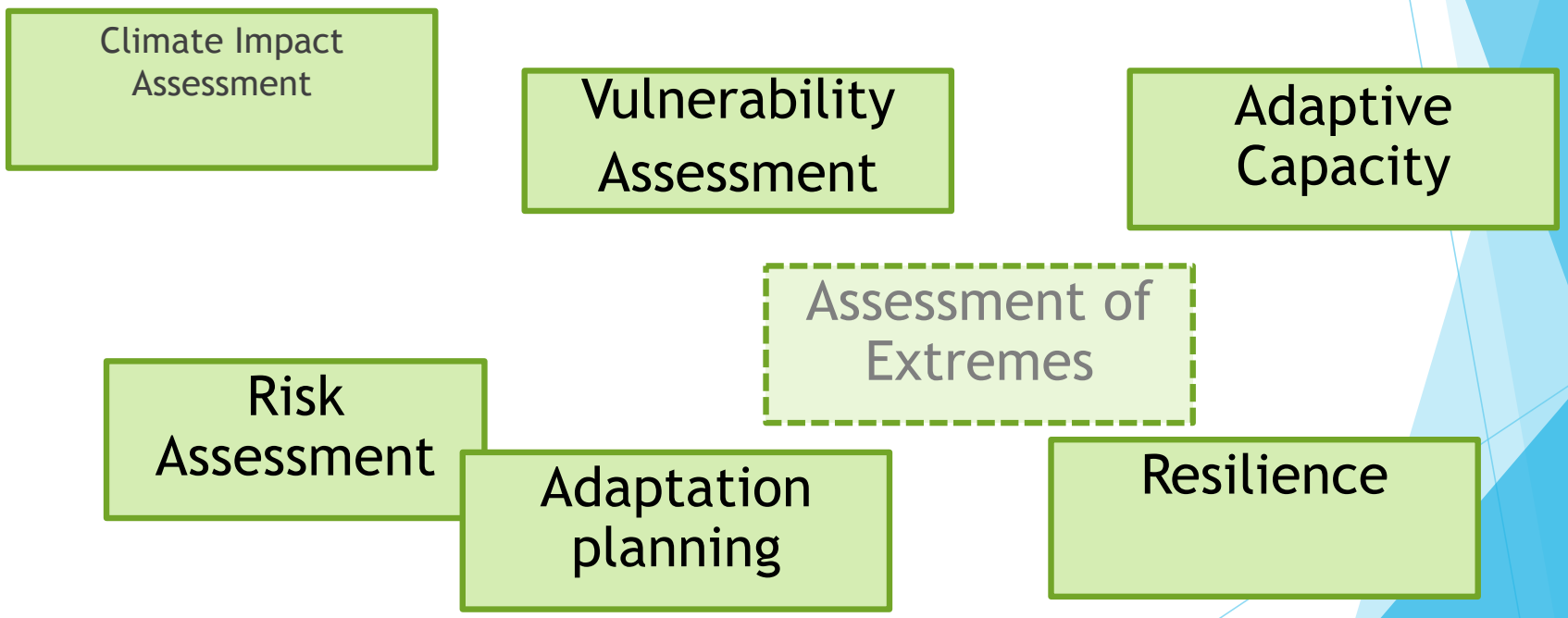
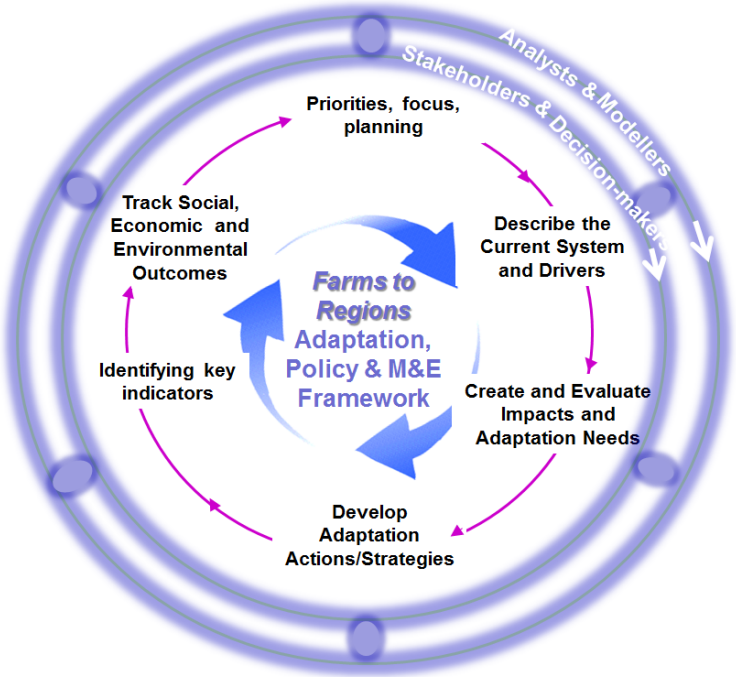


M&E Resilience
Agriculture and rural areas



- Focus: To identify relevant and feasible indicators to monitor level of resilience in the system and provide guidance on how to know the system elements are vulnerable and how to strengthen them
- Need to have indicators that can be easily interpreted by policy-makers

Defining Resilience

"The capacity [of a system] to absorb a shock" (Reghezza-Zitt et al. 2012; Bousquet et al 2016). While the concept of resilience makes sense intuitively, it is challenging to bring together all aspects of the system for the economy, society and environment in a way to identify:

- What makes each resilient,
- What elements need to be strengthened as well as
- What elements might undermine resilience. To make the concept of resilience easier to incorporate in policy making, indicators can be used to provide a snapshot of key trends in the system or sector.

Stakeholder mapping Ontario

National & global

Agriculture and Agri-food Canada
Statistics Canada
Ministry of Environment and Climate change
Association of Municipalities

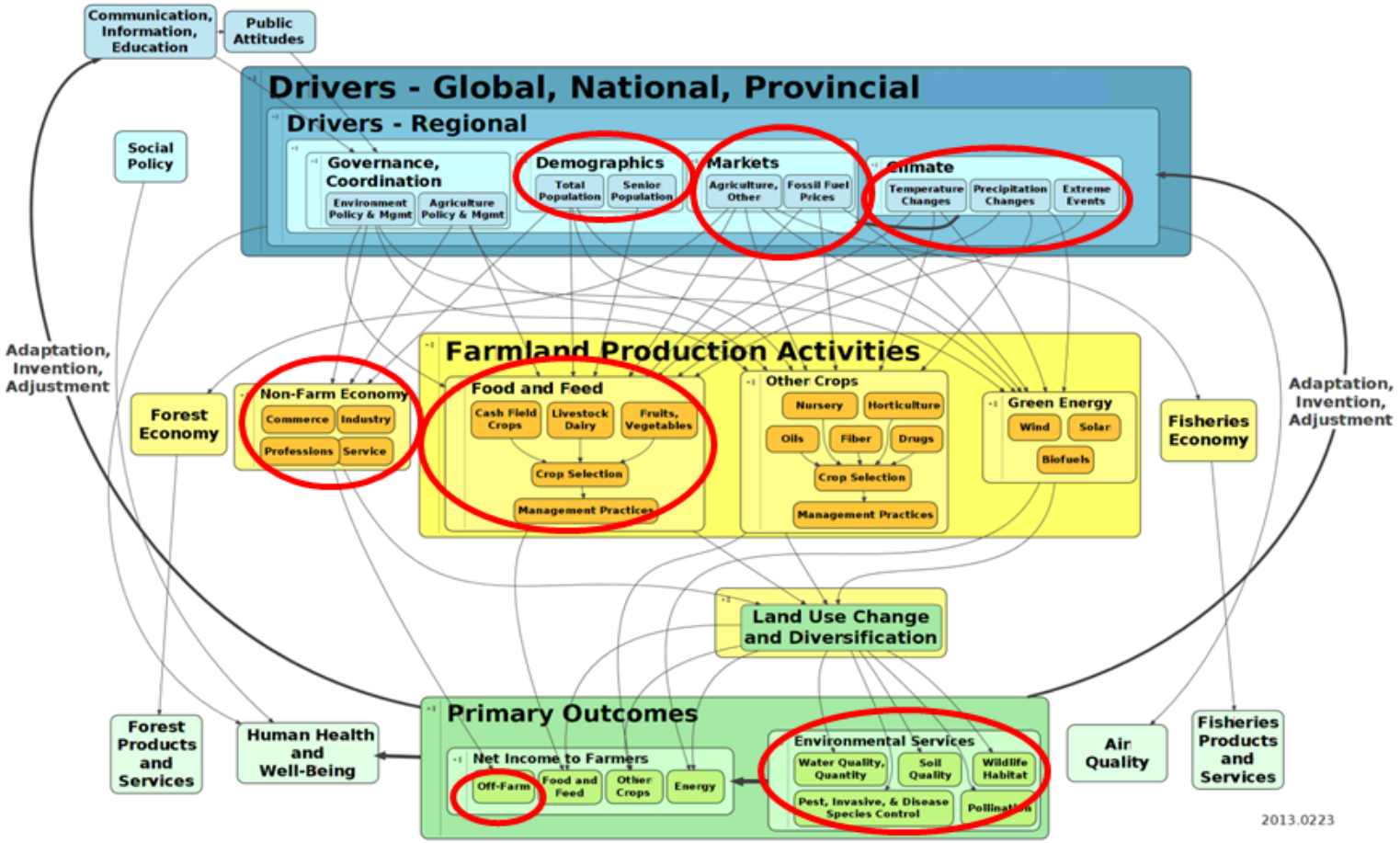
Provincial

Ontario Centre for Climate Impacts
Ministry of Agriculture, Food and Rural Affairs
Ministry of Natural Resources

Local

City of Ottawa
Ontario Soil and Crop Improvement Association
Dairy Farmers of Canada
Ontario Crop Producers
Organic Agriculture Canada
Cattleman Association

Describing the Current System and M&E



Identifying Indicators

Six critical themes:

Climate change (seasonality and severe weather)

Rural population (age, health, employment and income sources)

Farmland production (farmland production activities (and related land-use change and diversification of both plant and animal production).

Markets, Economy (economic situation for agricultural producers consider financial status (debt and income stability) and overall contribution to regional GDP)

Rural infrastructure (roads, buildings and water management systems)

Environment and biodiversity (erosion, species condition, species shifts because of climate change)

Short and long list of indicators - final wil cca. 25 indicators (these have data available)

Conclusions

- Relatively weak integration between agriculture and climate change adaptation needs
- Better linkages between market responses and climate change in the sector
- Integration of extreme events into the modeling and planning to explore sensitivity analysis of how production, environmental and economic measures respond to particular extreme weather events.
- Analysis of trajectories of risk and productions scenarios
- Defining of risk indices for communities (e.g., water, human health, pests and disease).
- Better integration with agricultural policies and their evaluation