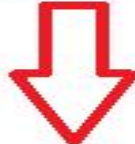


# SPATIALLY-EXPLICIT RIVER BASIN MODELS FOR COST-BENEFIT ANALYSIS TO OPTIMIZE LAND USE

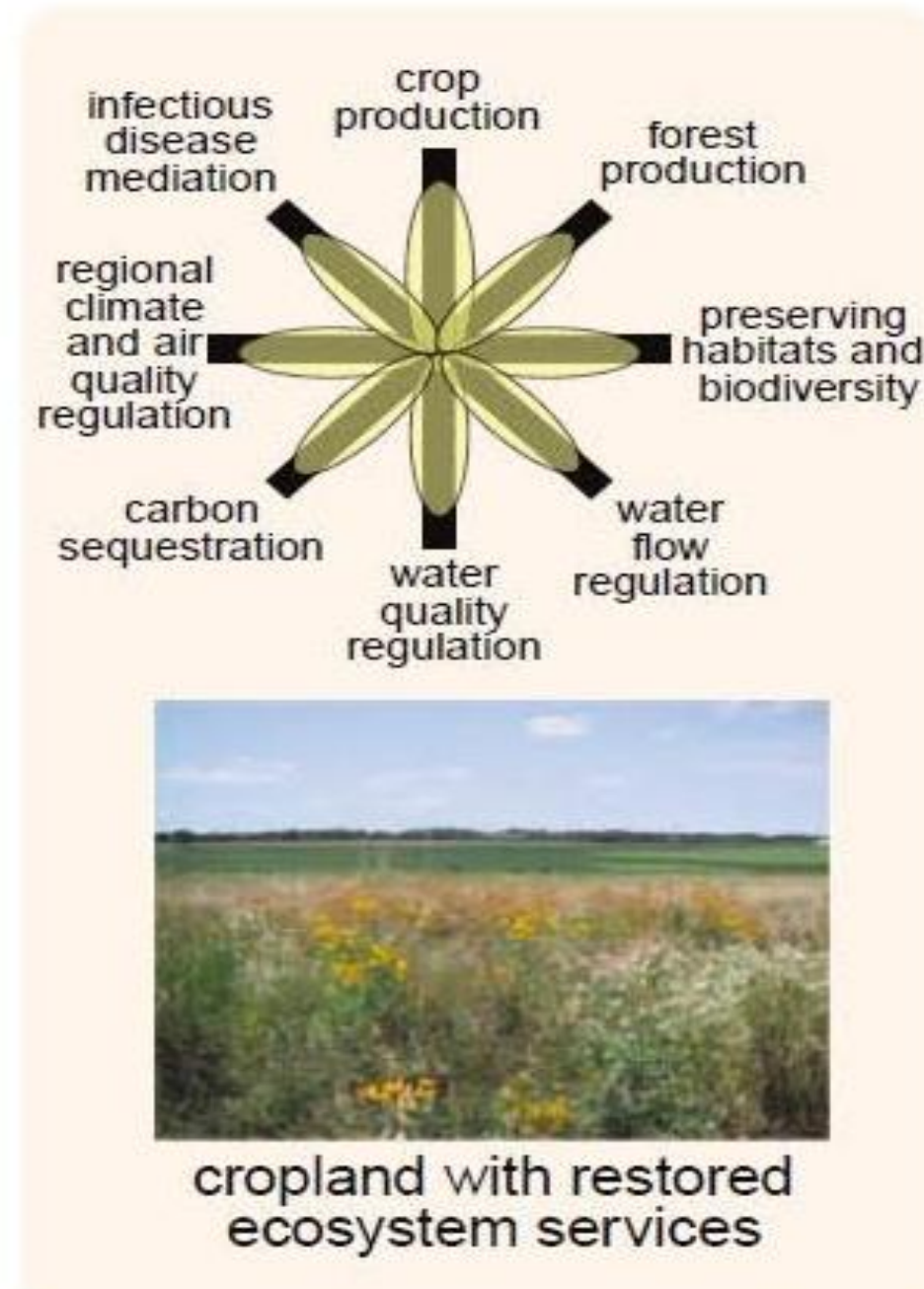
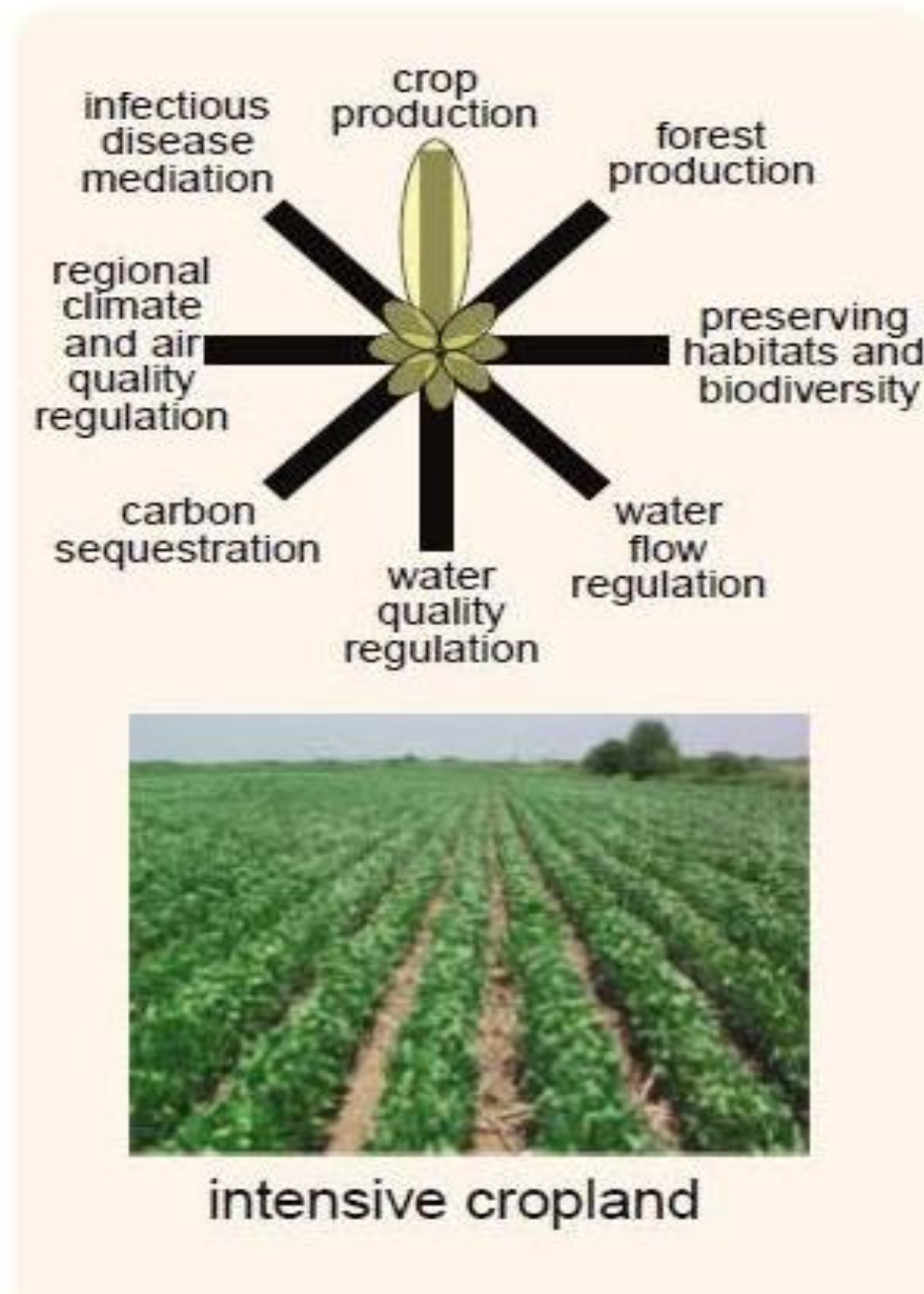
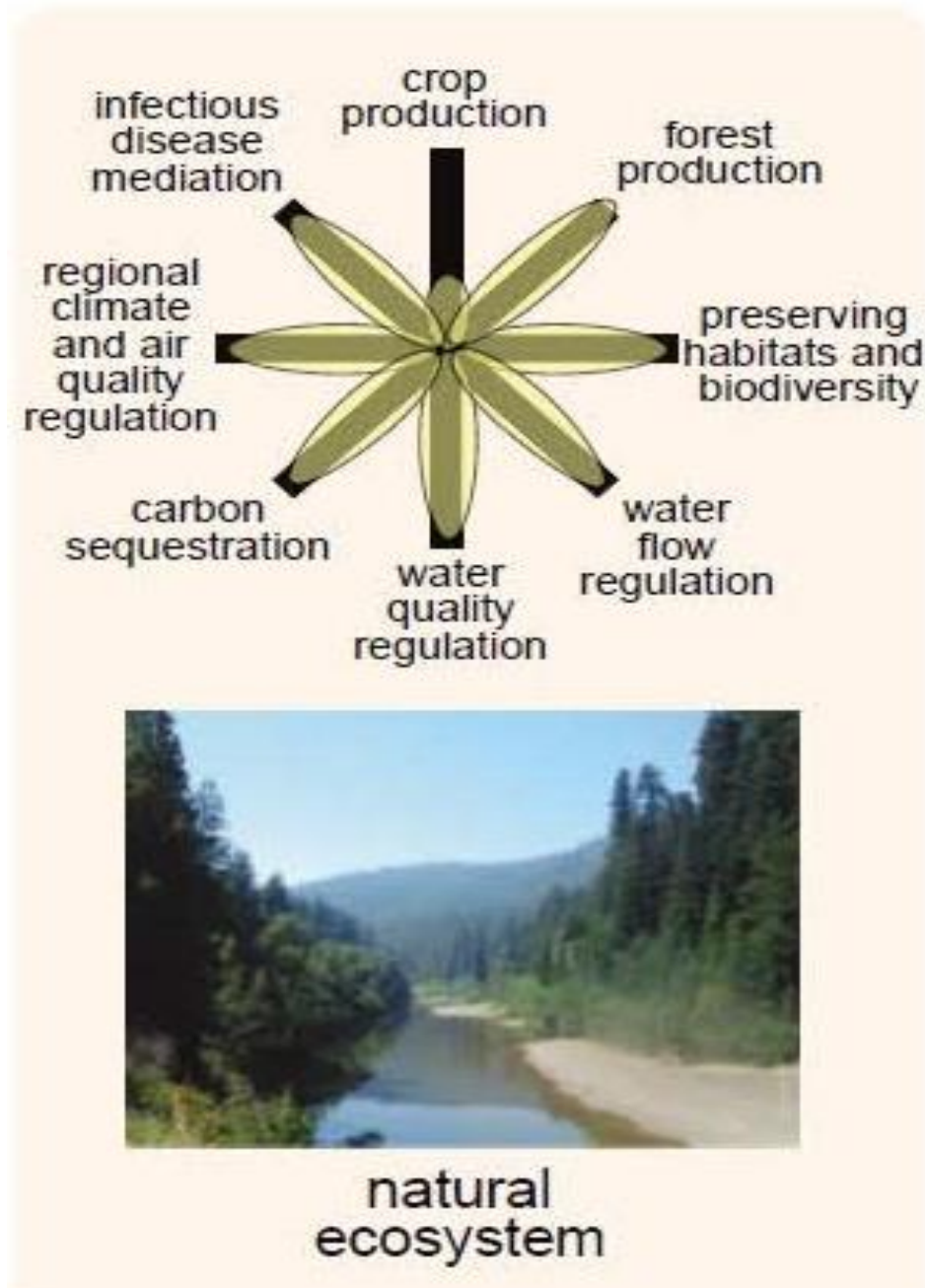
Jawad Ghafoor, Marie Anne Eurie Forio and Peter Goethals

# INTRODUCTION





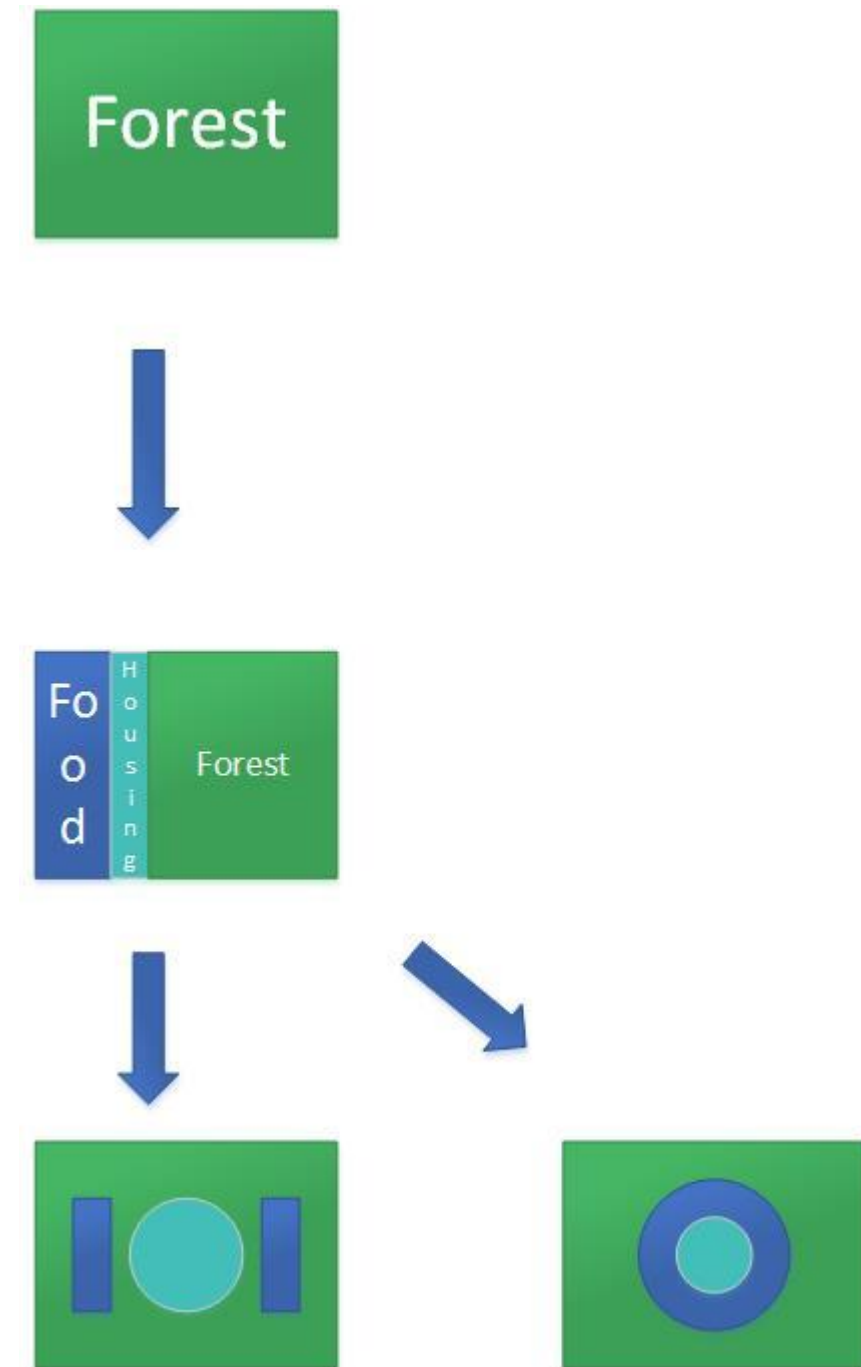
# LAND USE TRADE OFF



Jonathan A. Foley et al (2005)

# COST BENEFIT ANALYSIS NEED

- Population increase
- Land use deterioration
- Water quality deterioration
- Cost Benefit ratio



# AIM OF REVIEW

- Asses costs and benefits of land utilization within river basin.
- Models used for Cost Benefit Analysis in River Basin.
- Data needed for models.
- SWOT analysis.

# LITERATURE SEARCH

- **Land use**

Searched as: TS=("land use\*")

- **Land use model:**

Searched as: TS=("land use\*" AND "model\*")

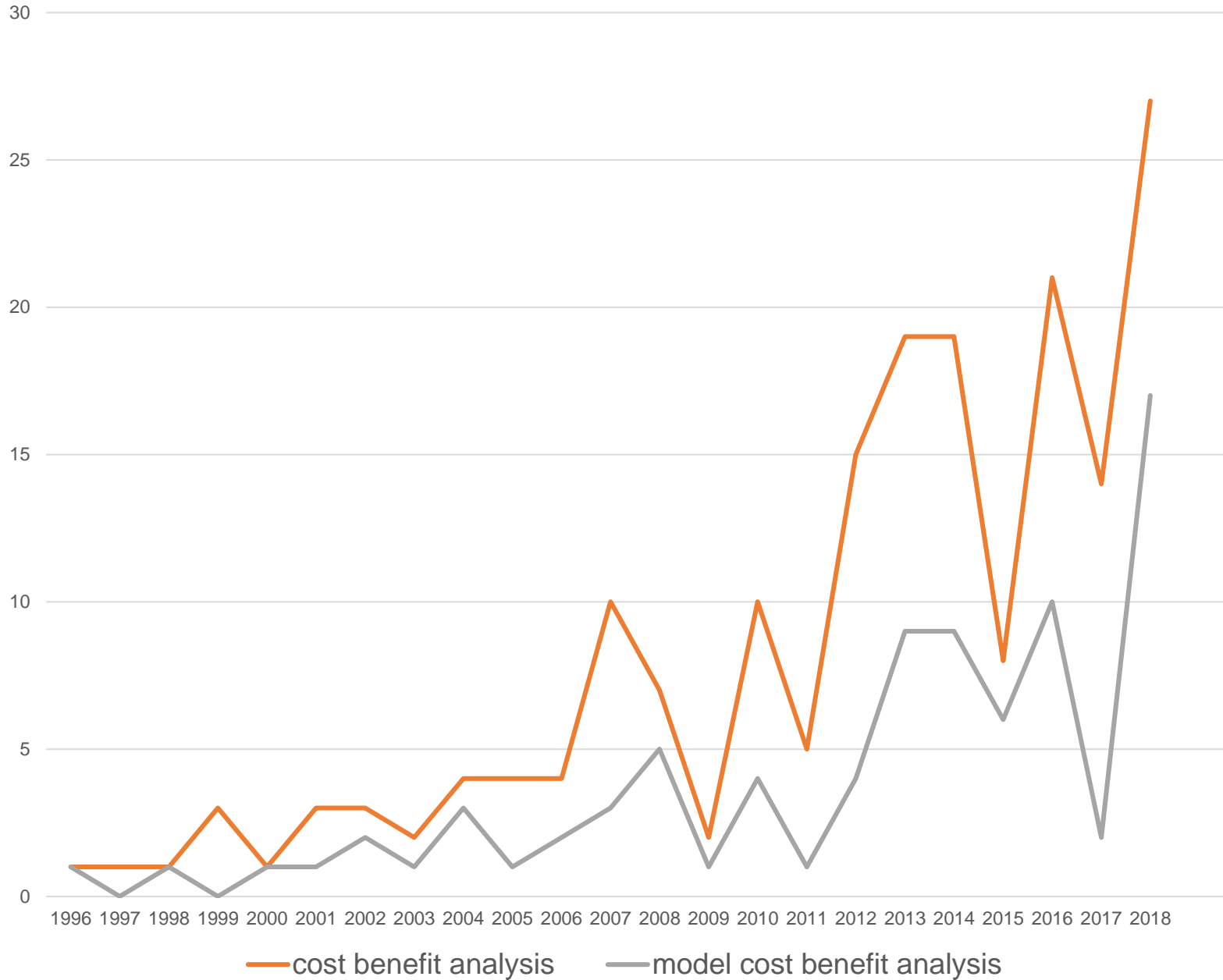
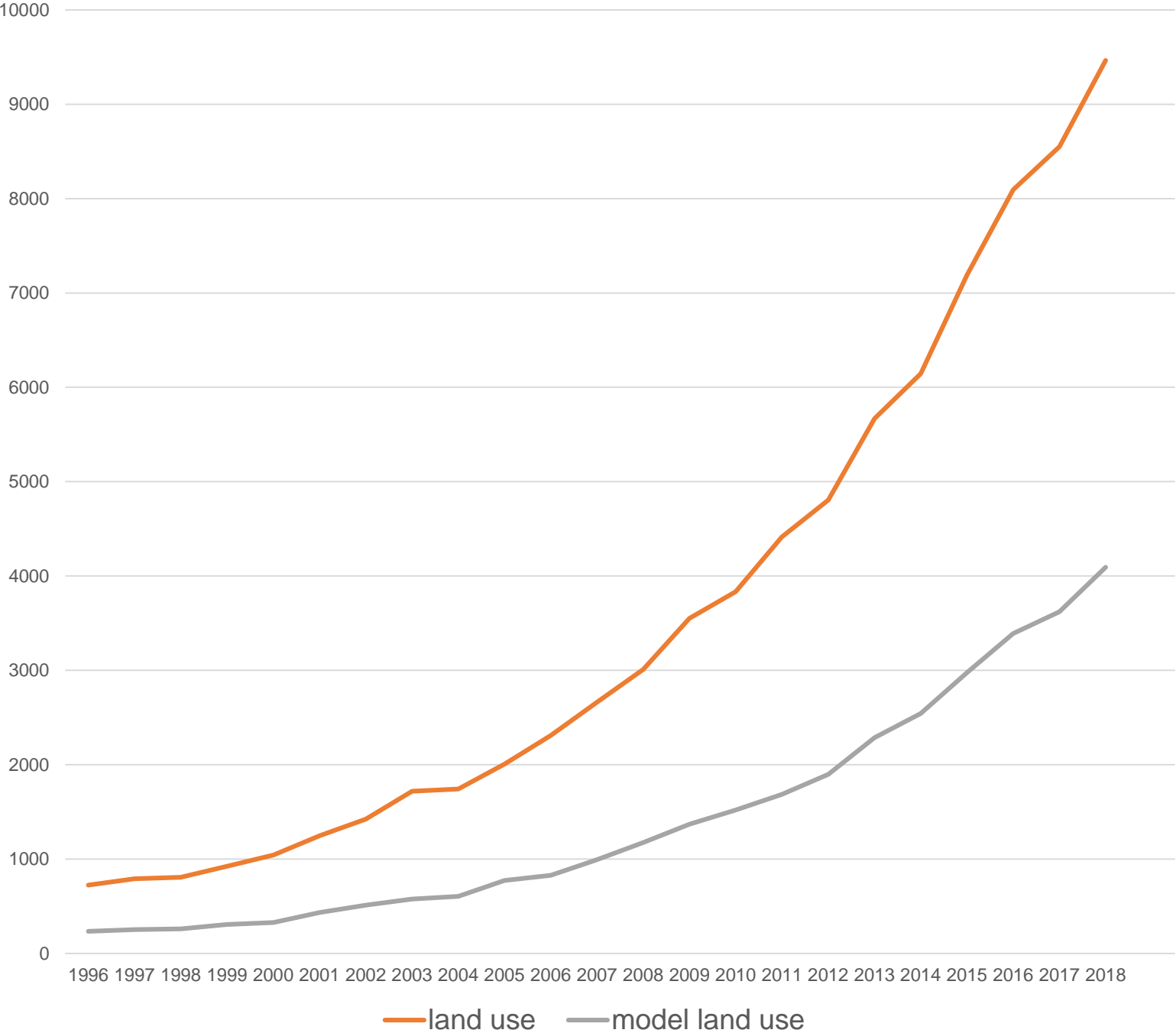
- **Cost benefit analysis:**

Searched as: TS=("land use\*" AND "cost benefit analysis\*")

- **Cost Benefit Analysis Model:**

Searched as: TS=("Land use\*" AND "Cost benefit analysis\*" AND "model\*")

# LITERATURE SEARCH CONT.



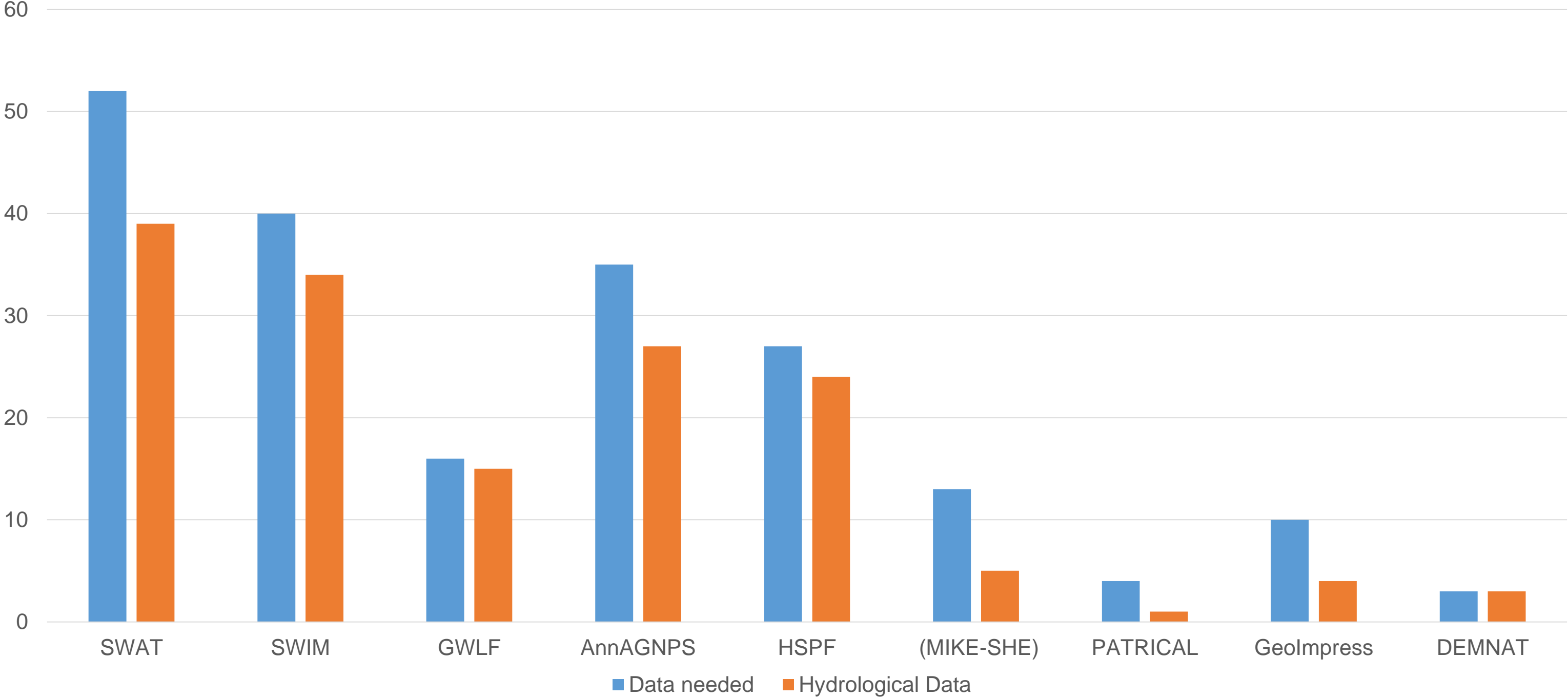


# MODELS

- Soil and Water Assessment Tool(SWAT).
- Soil and Water Integrated Model(SWIM)
- Generalized Watershed loading Function(GWLF)
- The Annualized Agricultural Non-point Source Pollution(AnnAGNPS)
- Hydrological Simulation Program-FORTRAN(HSPF)
- MIKE-SHE
- Precipitación Aportación en Tramos de Red Integrado con CALidad del agua (PATRICAL)
- Geolmpress
- Dose Effect model NAture Terrestrial (DEMNET)



# DATA NEEDED



# SWOT ANALYSIS

## Strengths

- Suitability for exploring various types of river basin.
- Applicable to different scales
- Provides time and spatial-specific output

## Weaknesses

- Lack of model validation
- Models are complex
- Model assumption may not be valid in some cases
- Difficult to convince river manager to model outcomes

## Opportunities

- Spatial explicit models becoming more reliable
- Data availability and quality is increasing
- Power of computer is increasing
- Modelling is advancing

## Threats

- Data collection is expensive
- Over or under prediction

# CONCLUSION

- Opportunities to support decision-making and policy making
- Risk in misuse and misinterpretation of simulation
- Strong collaboration among field data collectors and model developers

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