Evaluating the options of combining economically, socially and ecologically sustainable agriculture.

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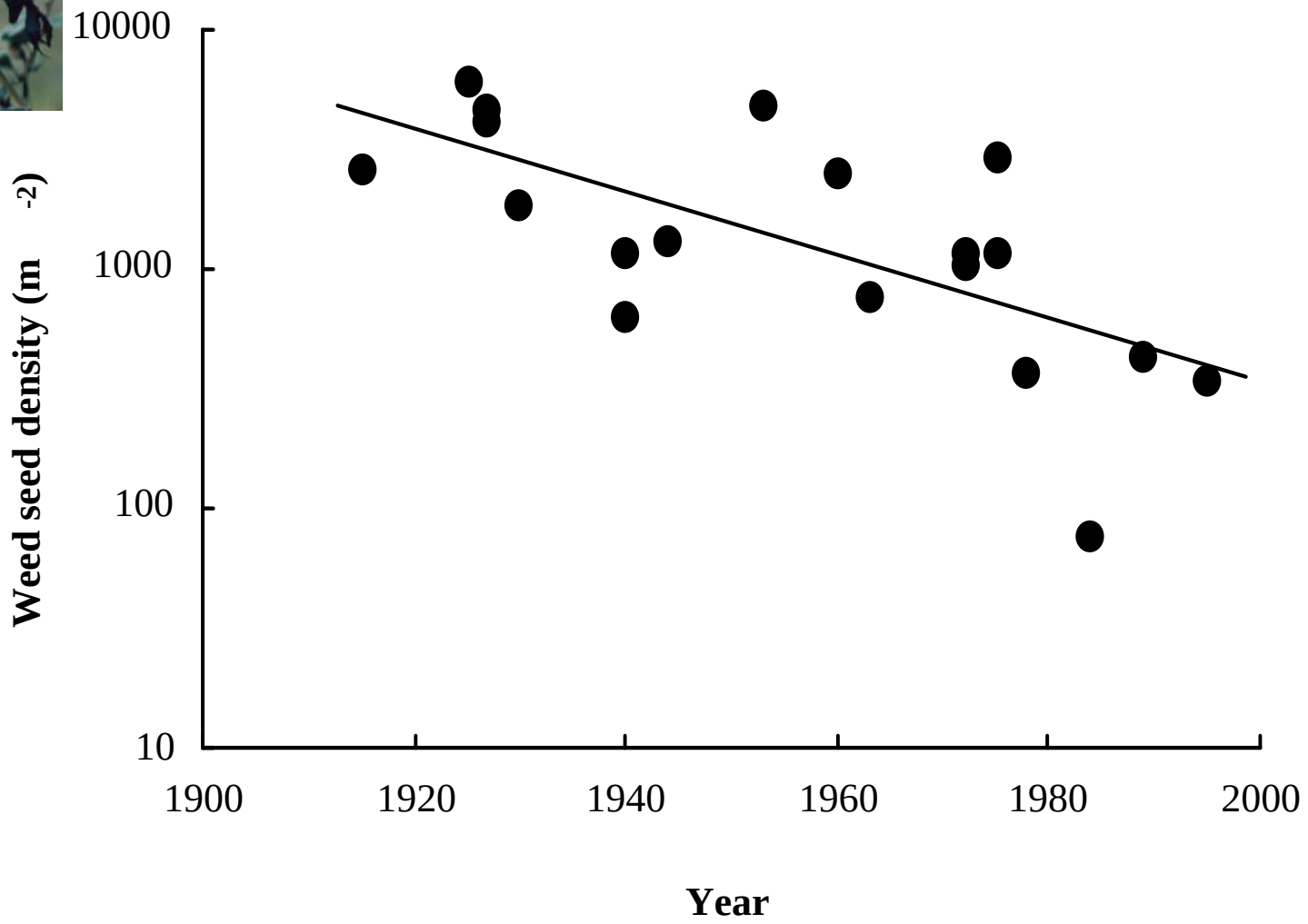
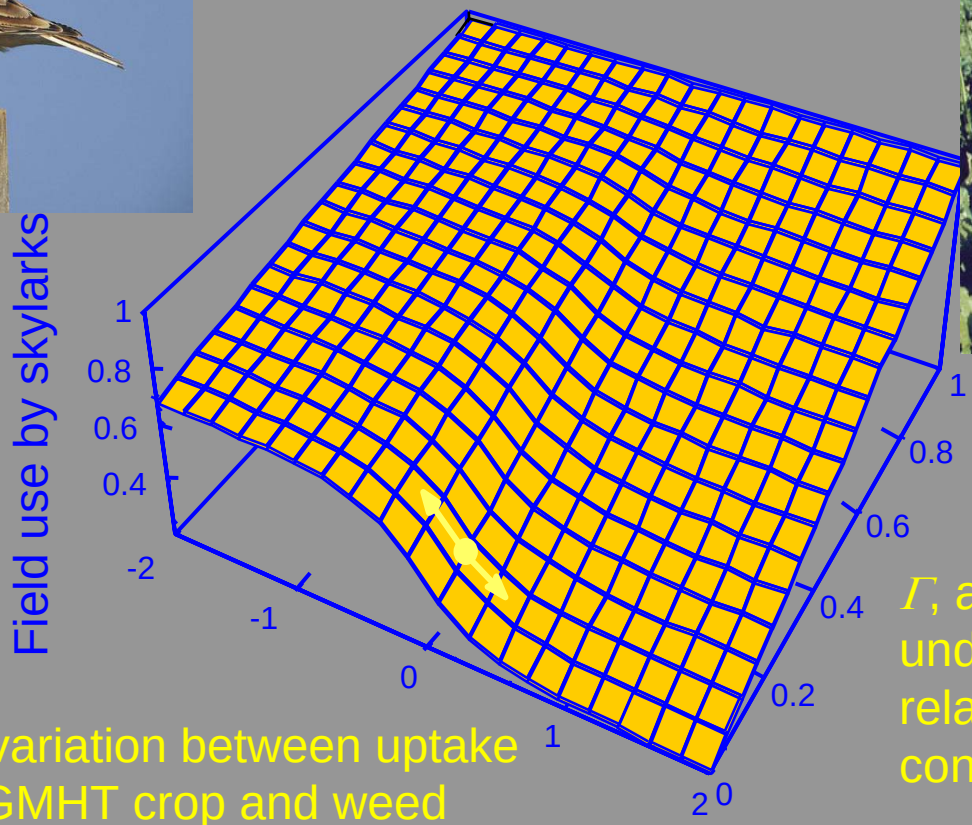
95% decline in seed density over last century



Skylark aggregative response

The impact of weed control on field use by skylarks



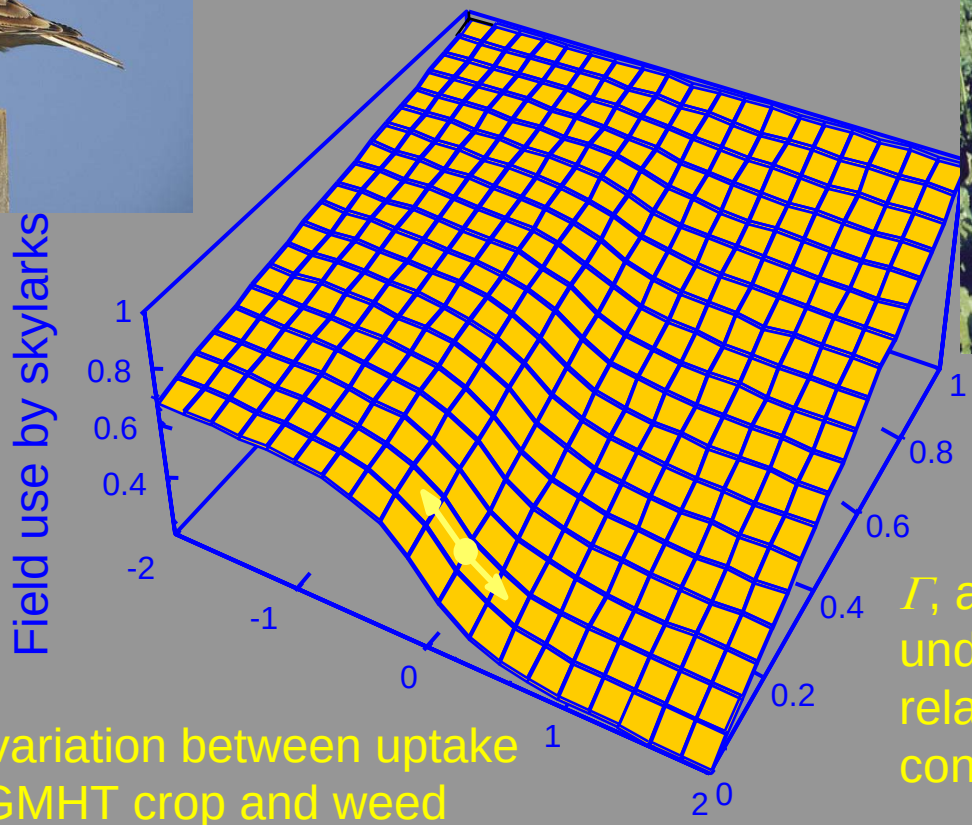
Covariation between uptake of GMHT crop and weed infestation

Γ, average weed density under GM technology relative to conventional control

Low weed abundance

High weed abundance

The impact of weed control on field use by skylarks



Covariation between uptake of GMHT crop and weed infestation

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Summary of agri-environment studies. N=62.

Published in peer reviewed journals	26%
In national language (not UK)	87%
Have control sites	90%
Have replication	77%
Use statistical tests of significance	69%
Analyse changes between two points in time	26%
Analyse trends in time	32%
Have paired scheme and control sites	16%
Have baseline data	34%
Controls, replication and statistical analysis	58%
Controls, replication, statistical analysis and reduced bias	39%

Summary of agri-environment results.

	+	+/-	-	O
Plants	6	0	2	9
Birds	4	9	2	
Arthropods	11	3	0	3

Only studies with statistical tests

Agri-environment schemes

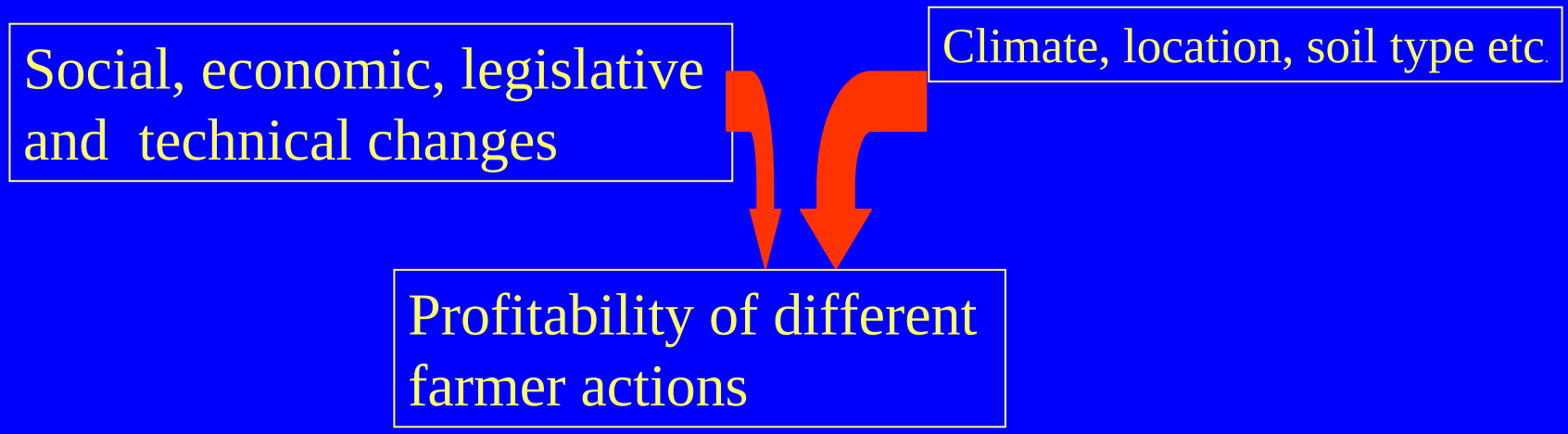
Agri-environment successes

So what will our RELU grant do…

What should an economically rational farmer do?

- Silsoe Whole Farm model predicts land use and farming practice for different soil types, expected weather regimes and stated economic parameters.

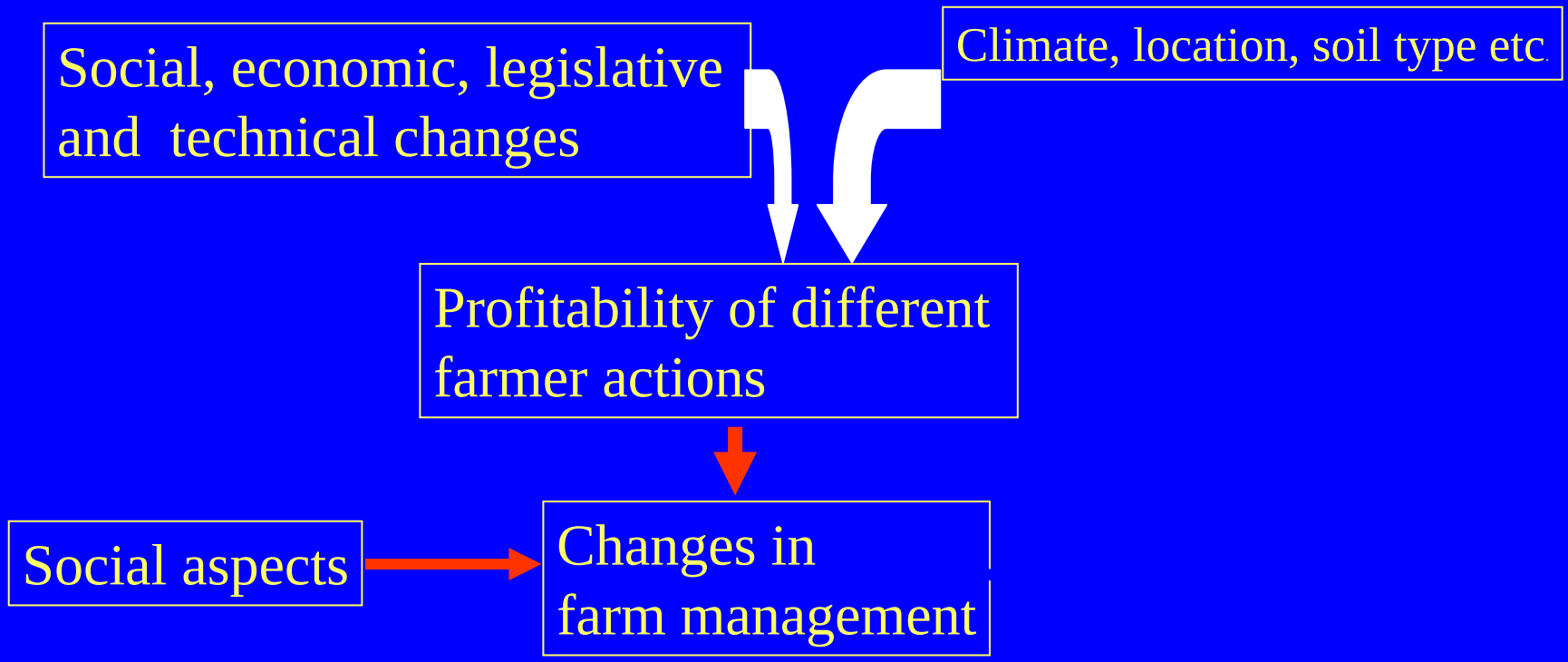
Conceptual framework



But farmers might not be economically rational

- Profit is not the sole driver e.g. interests in field sports or conservation
- Stakeholder and institutional mapping plus farmer interviews.

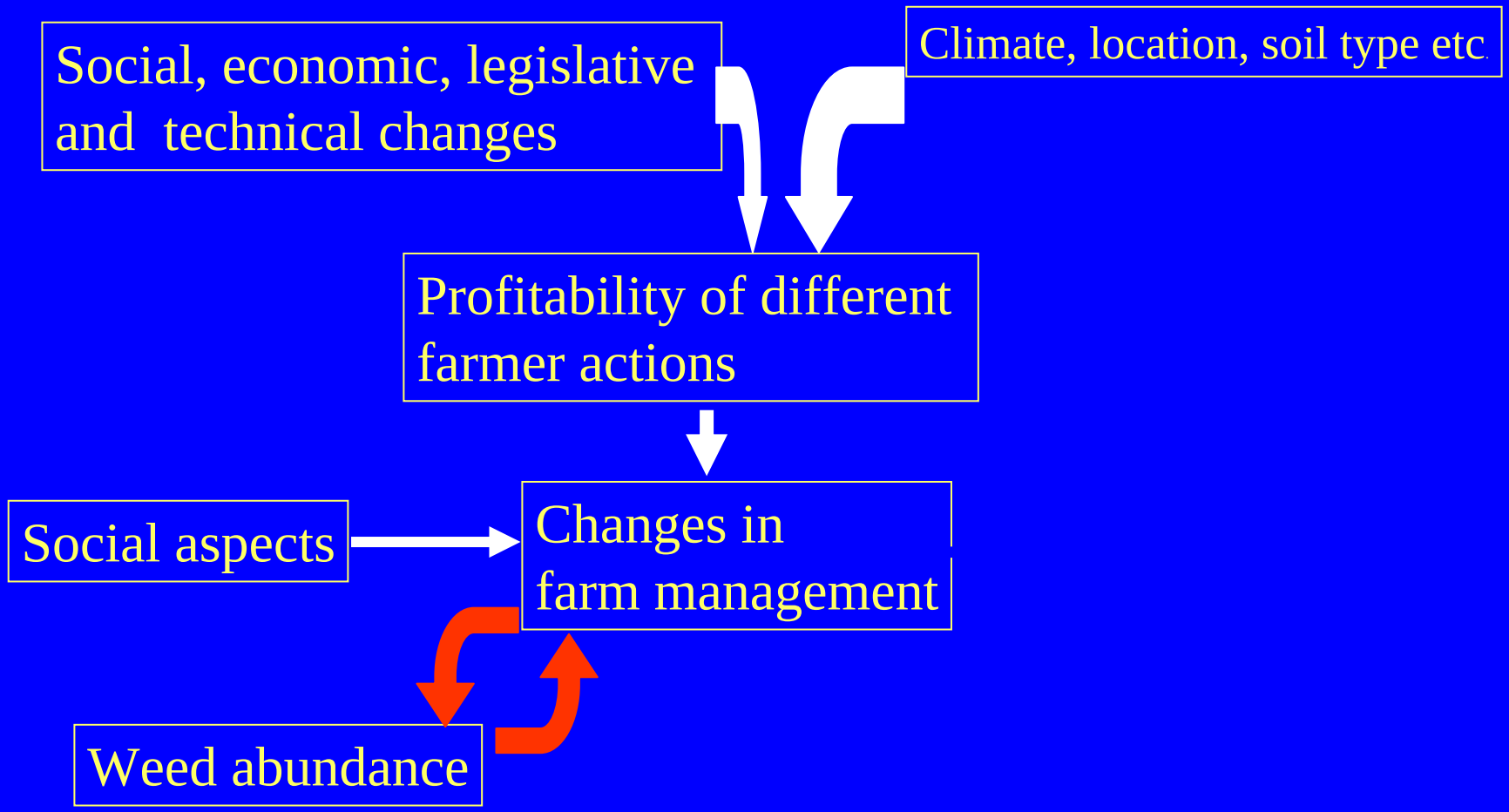
Conceptual framework



Weed populations

- Build on extensive model currently of 10 species using published and unpublished data.
- Extend.
- Apply to actual farms.
- Incorporate feedback into Silsoe Whole farm model

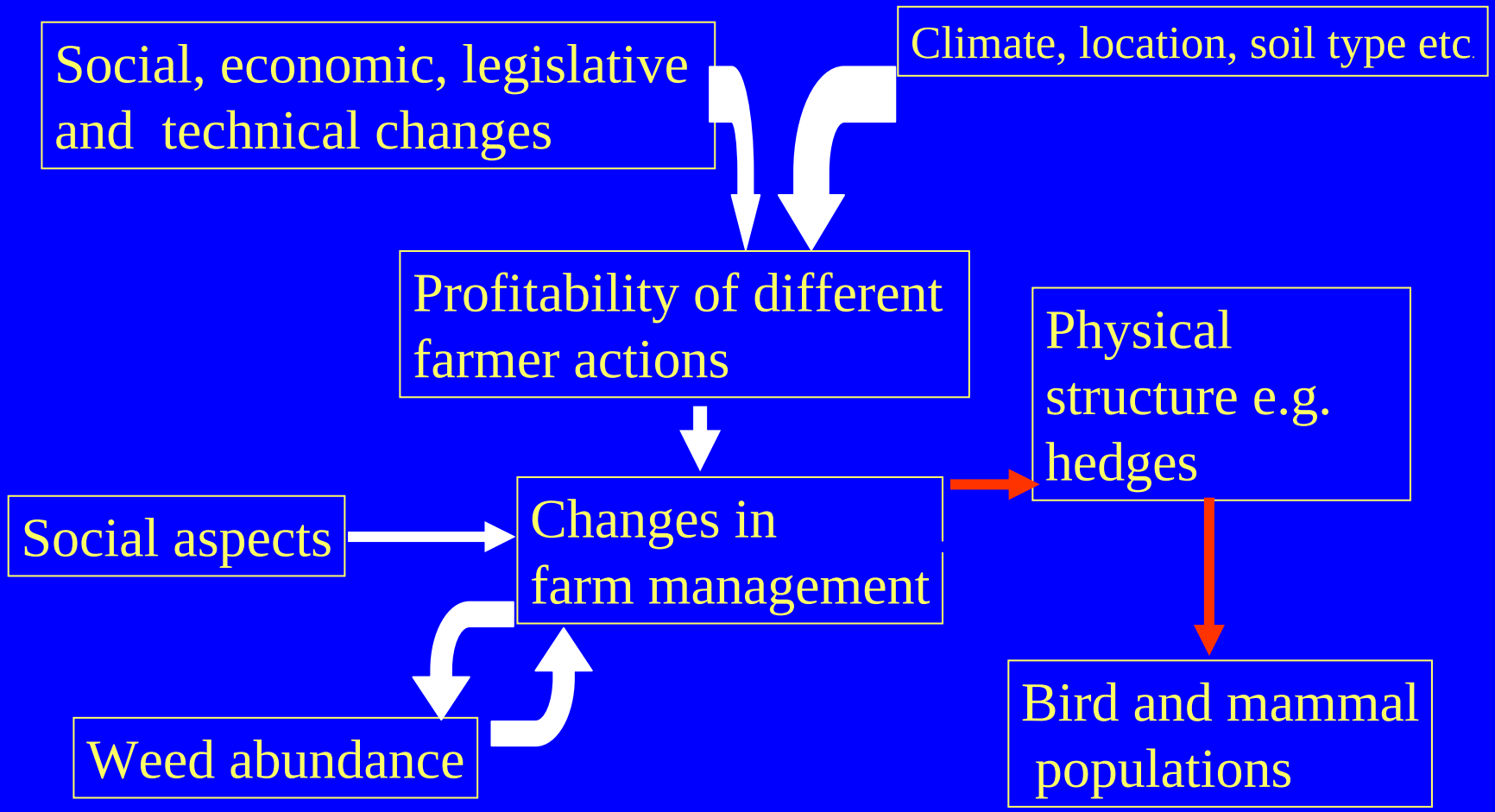
Conceptual framework



Impact of physical environment

- British Trust for Ornithology will analyse data on relationship between abundance and hedges, woods and crop type.

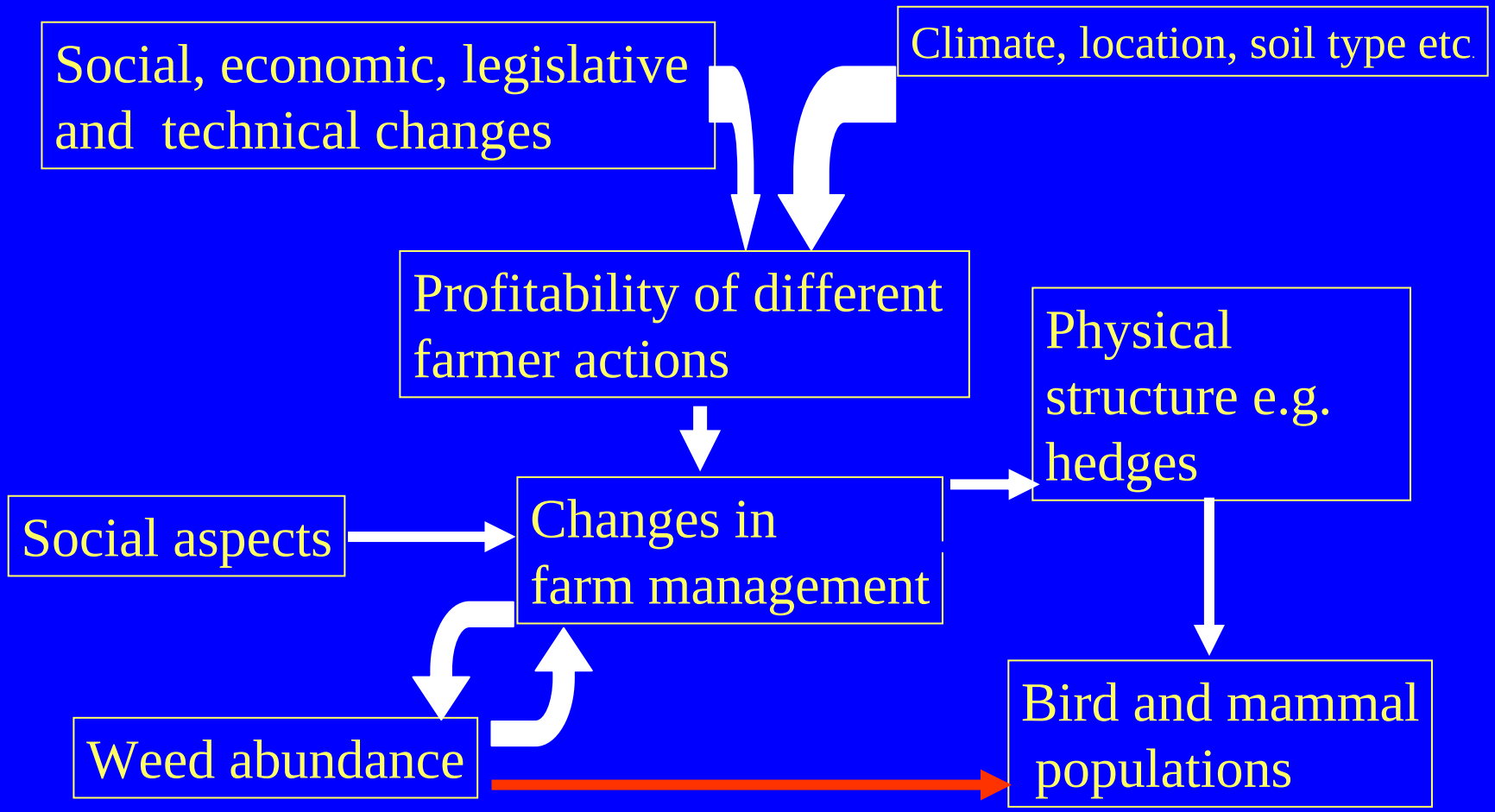
Conceptual framework



Impact of weed populations on birds

- Extend existing game theory population models

Conceptual framework



Can then consider political and technological change