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SIP
SUSTAINABLE INTENSIFICATION
RESEARCH PLATFORM


UNIVERSITY OF
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Centre for
Rural Policy Research


ROTHAMSTED
RESEARCH


University of
Kent


ADAS


CEH
Centre for
Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL


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PRIFYSGOL
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fera


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LEAF
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Integrated Farm Management


NIAB


Westcountry
Rivers Trust


BioSS


University of
BRISTOL


UNIVERSITY OF
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Eden
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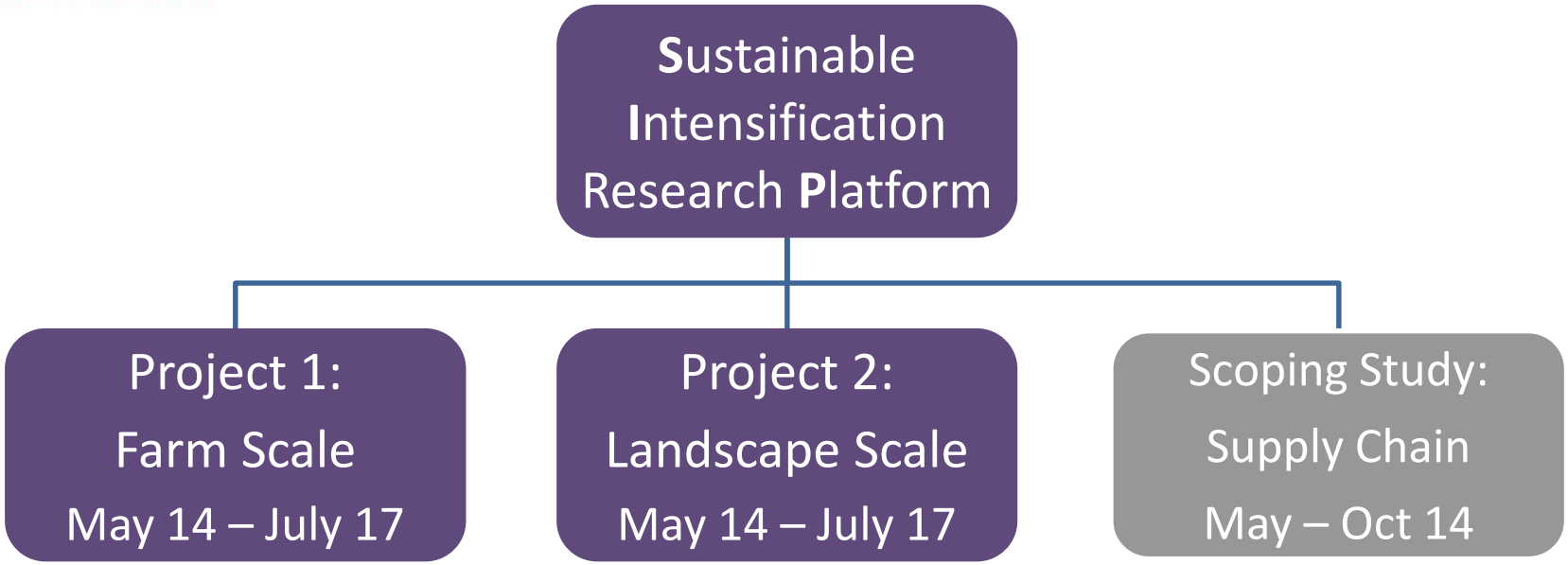
# What is the SIP?




Looking at opportunities and risks for SI in England and Wales, and how SI can be put into practice

# What is SI?

- The approach, whereby farmland is managed to maximise economic, environmental and social outcomes.

- The SI Platform investigates ways to increase farm productivity while reducing environmental impacts and enhancing the ecosystem services that agricultural land provides to society.

# What will be achieved?

**Key areas of work**

- Development of techniques for Integrated Farm Management
- Development of technical tools to identify opportunities and risks associated with sustainable intensification in different landscapes
- Identify ways in which farmers can collaborate more to meet the goals of sustainable intensification and identify models of good practice
- Create benchmarking tools to measure SI performance by farms

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# SIP Study Farm and Area Locations

Nafferton

Eden

Hanfaes & Conwy

Allerton & Upper Welland

North Wyke & Taw

Morley & Wensum /Yare

Future Farm

Avon

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# Project 1

- Develop improved indicators and standardised methodologies for land managers and their advisers to measure the economic, environmental and social performance of farms
- Identify and develop farm management interventions for the sustainable intensification of agriculture
- Investigate ways of better communicating complex messages to farmers and propose approaches for more innovative decision support

*Being addressed through six main work packages*

# Henfaes (upland livestock)

***Increase grassland productivity through optimised soil, nutrient and grazing management***

- Demonstrate how improved productivity (and economic gains) can be achieved for sheep farming through better grassland management, with little or no extra fertiliser
- Show how to produce lamb with a notably reduced carbon footprint
- Help inform the debate about how best to manage upland farms for the delivery of a range of ecosystem services

# North Wyke / Future Farm (lowland)

***Assess the impact and value of beef and dairy production from contrasting swards***

- Demonstrate potential trade-offs between animal performance, carrying capacity, nutrient yield and environmental impact (water, air) for contrasting pasture types within lowland livestock systems
- Quantify factors influencing the decision when to re-sow permanent pastures
- Demonstrate the potential to improve product quality (meat and milk) in relation to diet composition (fibre and protein)

# Morley (arable)

***Improve productivity of arable cropping systems and reduce consumption of high energy inputs***

- Demonstrate the effects of less-intensive cultivations and cover crops on productivity, economics and potential environmental impacts of combinable cropping systems
- Show how the function and resilience of arable soils could be improved through the use of over-winter cover crops to enhance soil structure and other properties
- Demonstrate practical considerations and routes for implementing cover crops on-farm

# Allerton (mixed)

***Examine alternative crop / soil management systems with potential to improve productivity and environmental outcomes***

- Demonstrate the practical benefits and constraints associated with alternative establishment systems and cover crops
- Evaluate pasture and sheep performance in relation to sward nutrients, and the role of leys in an arable rotation
- Strengthen the local farmer network and test SIP as an approach to engaging with the local farming community

# Nafferton (mixed)

***Examine contribution of recycled 'waste' and locally-grown feed to improved economic sustainability and food quality***

- Demonstrate organic fertiliser impacts on productivity, quality and health of spelt and rye for organic and conventional systems
- Show how recycled 'waste' could contribute to improved economic sustainability for local producers, reduced carbon footprint and better food quality
- Quantify the benefits of locally-grown rape seed and oats for enhanced milk quality in housed organic and conventional dairying

# Farm Performance Indicators (1.1A)

- Establish a suite of indicators for whole farms that could integrate with the Farm Business Survey (FBS)
- For a sample of East Anglian cereal and South-West dairy farms:
  - Use FBS data in models to generate estimates of environmental impacts (air and water pollution; greenhouse gas (GHG) emissions)
  - Undertake analyses to relate aspects of productivity to environmental outcomes, to test what extra information would be needed in FBS
    - Nitrogen inputs are a good proxy for nitrogen loading, and dairy stocking rate is a good proxy for methane emissions
    - No obvious proxy for phosphate or total GHG emissions
- Feed into 'SI Benchmarking tool' (SIP Project 2)

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# Indicator List

## Economic

- Profit per hectare
- Return on Capital Employed
- Gross Margin per hectare
- Gross Margin as proportion of £output
- Proportion of £output across different land uses
- Owner Stake
- Unit costs (£out / £in)
- Total and Variable Costs per hectare

## Environmental

- Water and air quality
- Ammonia emissions, nitrate and phosphate runoff
- Use of crop protection products
- Resource use [efficiency]
- Energy use and sources (electricity + fuel)
- Water use (irrigation method etc.) and sources
- Greenhouse gas emissions
- $CO_2$, $CH_4$, $N_2O$, total
- Biodiversity
- Soil quality
- Land use changes (outside of crop rotation)

## Social

- Farm level
- Farmer / manager age
- Successor identified
- Staff training and development
- Knowledge exchange between farmers
- Community
- Local produce
- Local employment and wages
- Maintained footpaths on farm
- Public engagement
- Landscape/society
- Landscape diversity
- Farm Assurance Membership

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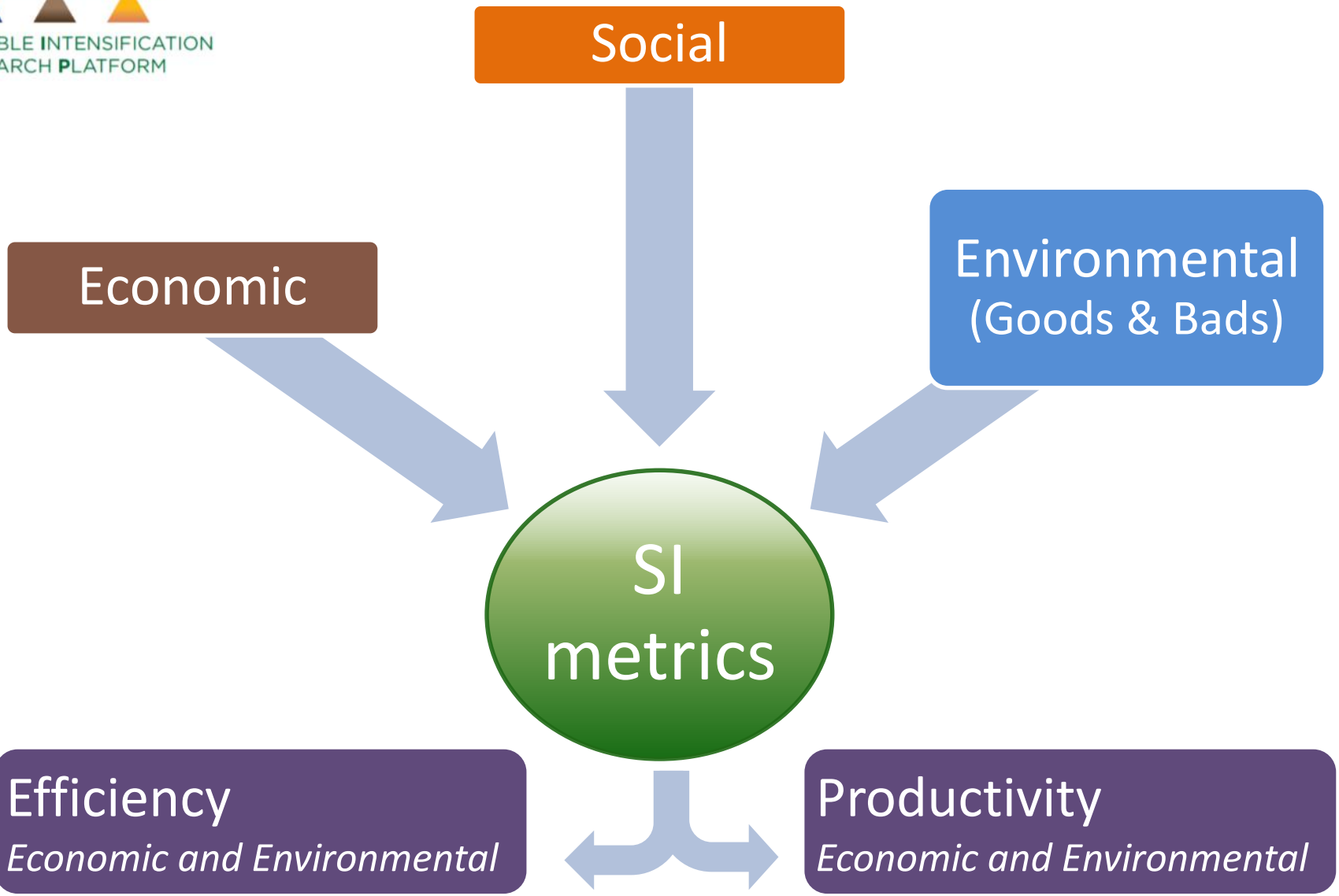
# Integrated SI Metrics



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# Project 2

- Aims to develop an understanding of the actions required at landscape scales to deliver SI by:
  - Investigating the spatial variation in land capability and environmental risk.
  - Identifying where coordinated action is required at these scales to achieve SI, and design and test methods of collaborative working in the study areas.
  - Understanding the barriers to collaboration and investigate mechanisms through which collaboration can be encouraged.

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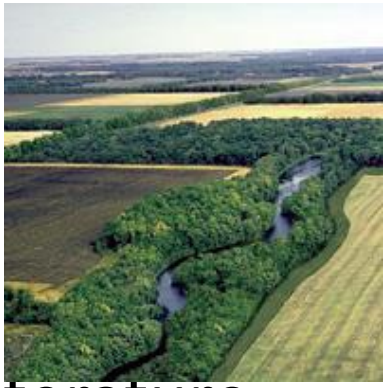
# 5 main strands



1. **Understanding farmer collaboration** (literature review, baseline survey across study areas and follow up focus groups etc).
2. Developing and applying **Dynamic Landscape Typology Tool**.
3. Applying and **testing landscape interventions** in platform case study areas.
4. Design and develop a **SI benchmarking system**.
5. Relating SI to **Ecosytem Services** (extra funding from Chief Scientist).


# Landscape Typology

See: https://eip.ceh.ac.uk/apps/sustainable-intensification/info/

Steven Anthony, David Lee, Michael Image
Bridget Emmett, John Watkins, Peter Henrys,
Jack Cosby, Amy Thomas
Nigel Boatman, Andrew Crowe

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# What is the typology?

- A database of national maps that describe:
  - The diversity of farm systems and attributes
  - The regional need or opportunity for improvement in specific outcomes that can be delivered by sustainable intensification practices.
- An analysis combining these maps with details of selected SI practices to guide regional practice selection

# BASELINE FARM SURVEY
## interview schedule

- **SECTION A. SUSTAINABLE INTENSIFICATION – YOUR VIEWS AND PRACTICES.**
- **SECTION B. QUESTIONS ABOUT YOU AND YOUR FARM BUSINESS**
- Covering size, tenure, labour, profitability, decision-support tools, etc
- **SECTION D. ENVIRONMENTAL AND RESOURCE MANAGEMENT**
- **SECTION D. COMMUNITY AND QUALITY OF LIFE.**

# Baseline Survey Results

(136 page Report currently with Defra for comments)

**Table 2.1: Sample information and response rate**

| Case Study Area | Taw | Conwy | Upper Welland | Nafferton | Wensum | Eden | Avon | Total |
|---|---|---|---|---|---|---|---|---|
| Sample size | 240 | 175 | 239 | 240 | 240 | 239 | 240 | 1,613 |
| No opted out* | 44 | TBC | 28 | 40 | 34 | 27 | 47 | 220 |
| Nil response/ wrong number | 72 | 83 | 85 | 69 | 113 | 80 | 109 | 611 |
| Effective sample (minus opt outs & nil response) | 124 | TBC | 126 | 131 | 93 | 132 | 84 | 782 |
| Completed interviews | 35 | 35 | 34 | 36 | 35 | 34 | 35 | 244 |
| Response rate (%) | 28% | TBC | 27% | 27% | 38% | 26% | 42% | 32% |

# Views on SI

- The survey reveals relatively high level of *awareness* of SI (51%) but lower levels of *understanding* of the concept, with only 23% of farmers conceptualising SI as meaning increased production while also taking care of the environment.
- A further 18% understand SI as an entirely agricultural production / business oriented concept while 51% struggled to define SI.

**Table 5.1. Involvement in SI activities**[1,2]

*[1]Figures have been rounded up.*

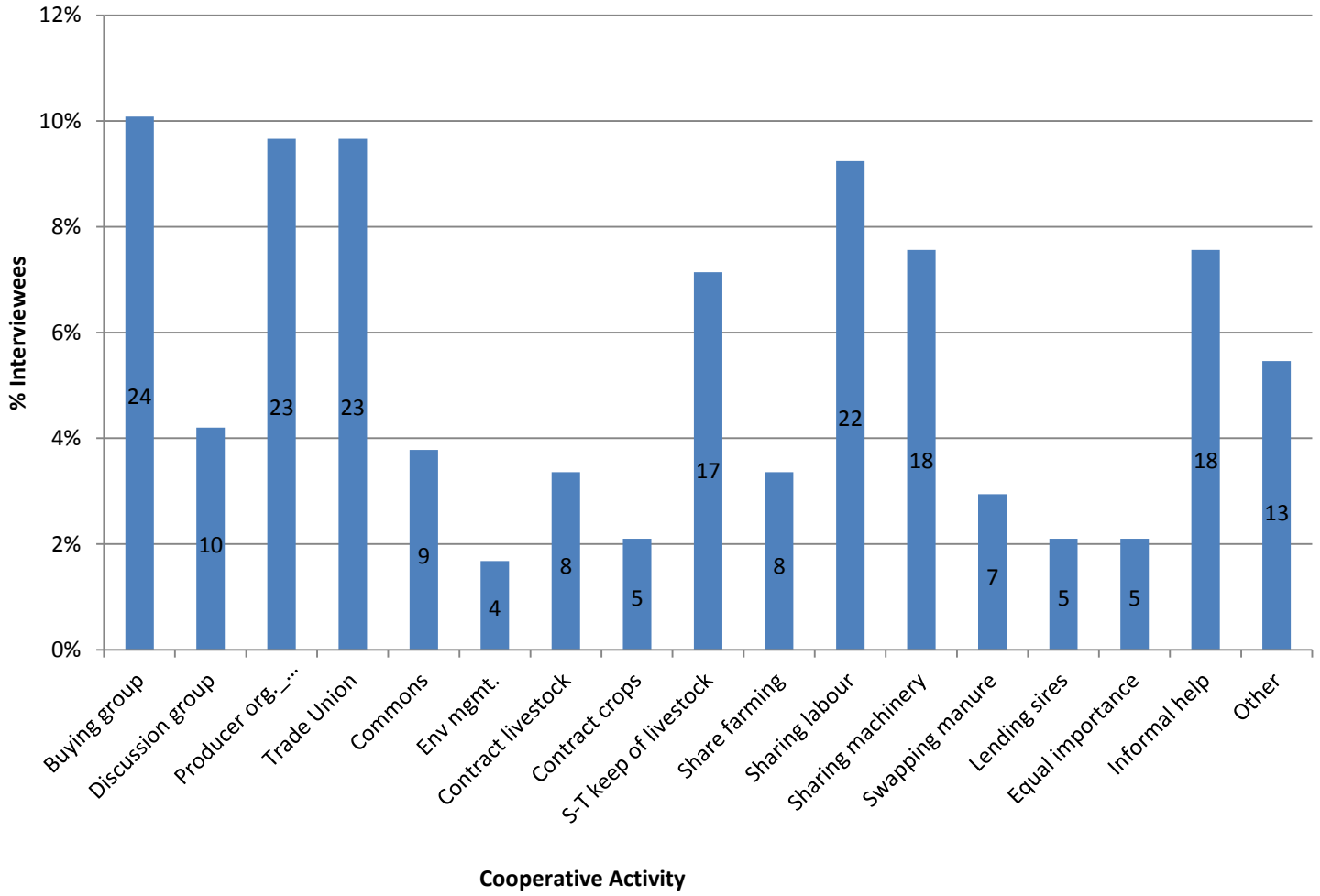
*[2]Columns do not sum to 100% as respondents may be involved in more than one activity*

| SI Activity (summary) | Already Carry Out (%) | Would consider introducing/ Increasing (%) | Would not consider (%) | Not applicable to Farming System (%) |
|---|---|---|---|---|
| | % | % | % | % |
| Tolerant varieties | 43 | 18 | 6 | 33 |
| Reduced tillage | 44 | 14 | 9 | 33 |
| Cover crops | 44 | 19 | 11 | 25 |
| Improve animal nutrition | 59 | 13 | 9 | 19 |
| Reseed pasture for improved nutrient value etc. | 59 | 14 | 15 | 12 |
| Predict disease and pest outbreaks | 29 | 26 | 23 | 21 |
| Precision farming | 31 | 31 | 18 | 21 |
| Monitor & control on-farm energy use | 45 | 24 | 16 | 15 |
| Optimise marginal land for ecosystem services | 80 | 10 | 6 | 4 |
| Train staff for improved sustainability | 18 | 16 | 11 | 54 |

# Collaboration/co-operation

- Almost all farmers are currently involved in at least one cooperative activity. This headline figure challenges the stereotypical image of the independent and uncooperative British farmer. This is an image that was endorsed by some respondents but it is a belief that may not reflect reality.
- The most common cooperative activities that are characterised as the most important to farmers are: buying group membership, producer group membership and sharing labour and or machinery.
- Only six of all surveyed farmers were not currently involved in any co-operative activities.

# Respondents' single most important co-operative activities



# Thank You

Funding from Defra for the SIP is gratefully acknowledged