

Agriculture Forestry and other Land Use Greenhouse Gas Emissions

Lochaber Case Study

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Highland Environment Forum
14th March 2016

Guiding documents



978-0-9573549-8-2

UK Greenhouse Gas Inventory, 1990 to 2013

Annual Report for Submission under the Framework Convention on Climate Change

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September 2015

This work forms part of the Science Research Programme of the Department of Energy and Climate Change.



Intergovernmental Panel on Climate Change

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Volume 4

Agriculture, Forestry and Other Land Use

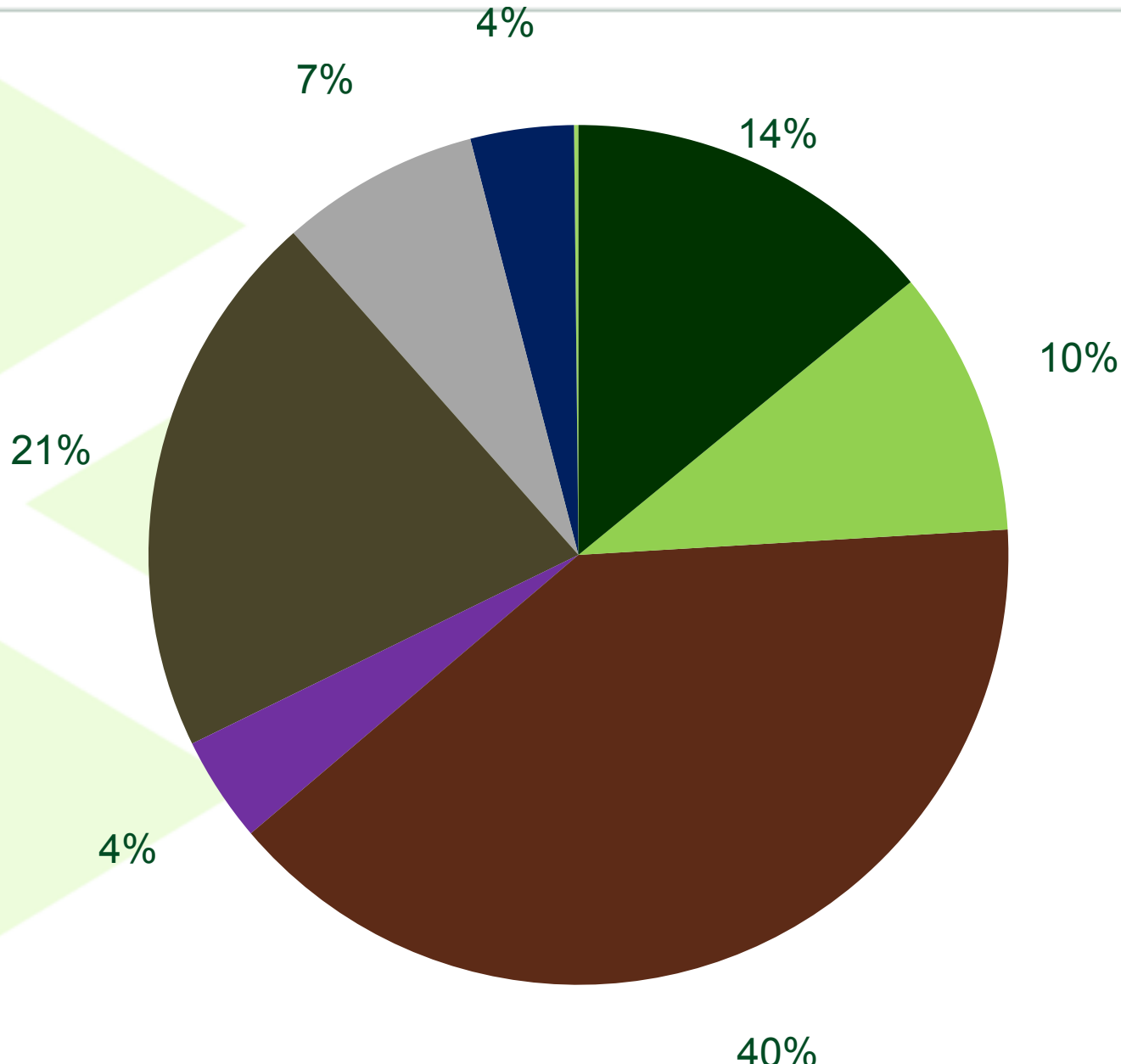
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IPCC National Greenhouse Gas Inventories Programme

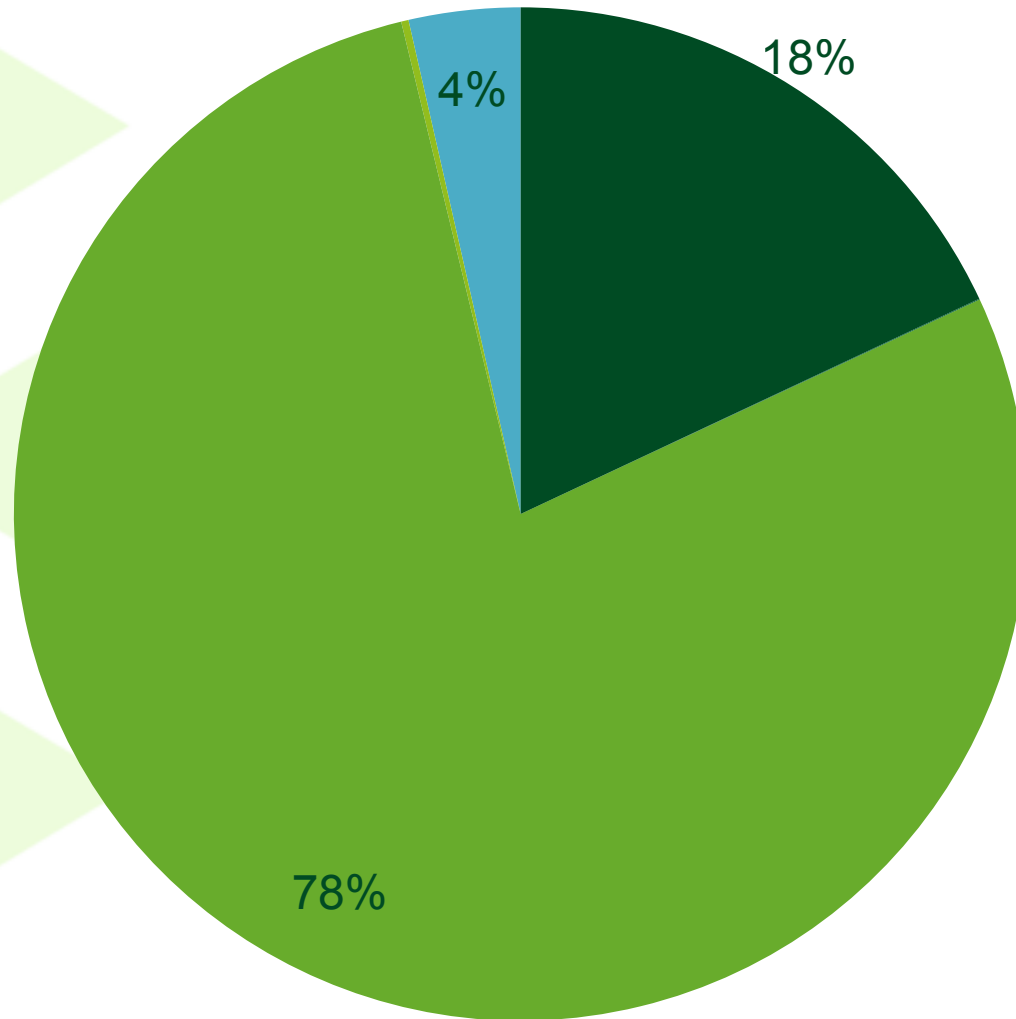
IGES

Lochaber Land Cover LCS88



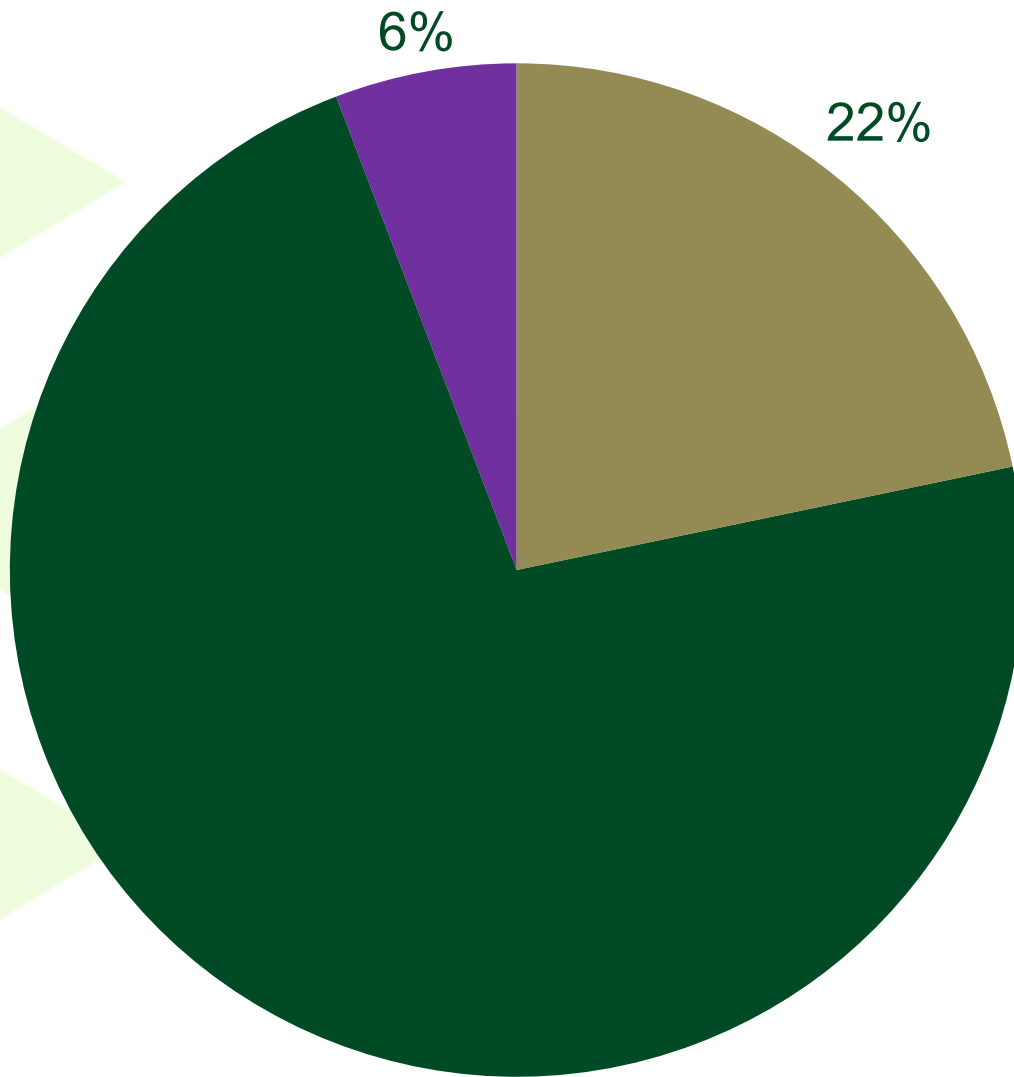
- Forest
- Grassland Impr
- Heathland
- Bog and bog/m
- Acid grassland
- Montane
- Freshwater/mar
- Urban

Lochaber Land Use 2012 %ages



- forest land
- cropland
- grassland
- settlement
- other

Lochaber Soil



- Mineral
- organo mi
- organic

Carbon stocks



Mean Soil C stocks to 1m tC/ha

Brown earths	152	
Podzols and ironpans	154	
Surface water gleys	167	
Groundwater gleys	173	
Peaty gleys/podzols	362	
Deep peat	539	
Rankers and rendzinas	108	
Lochaber total estimate		131,521,456t

Agricultural emissions



- **Animals**
 - Enteric methane
 - Manure methane
 - Manure nitrous oxide

- **Soils**
 - Fertiliser
 - Manure
 - Crop residues
 - Grazing returns

June Agricultural Census



9 parishes

Animal numbers

Beef cows 2,962

Calves 2,052

Total cattle 6,205

Pigs 100

Horses 245

Ewes 39,272

Lambs 30,988

Total sheep 82,578

Hens 6,091

Goats 52

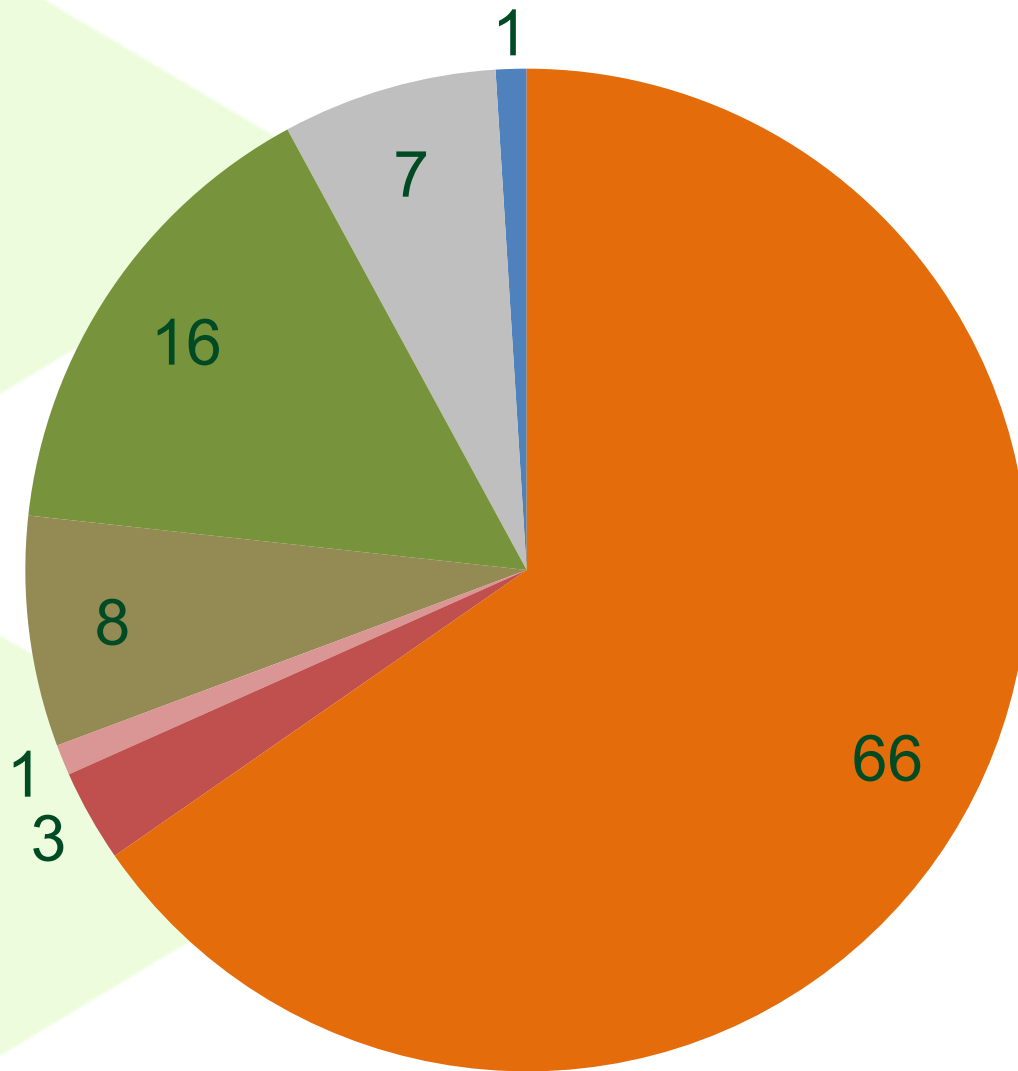
June Agricultural Census



Crops

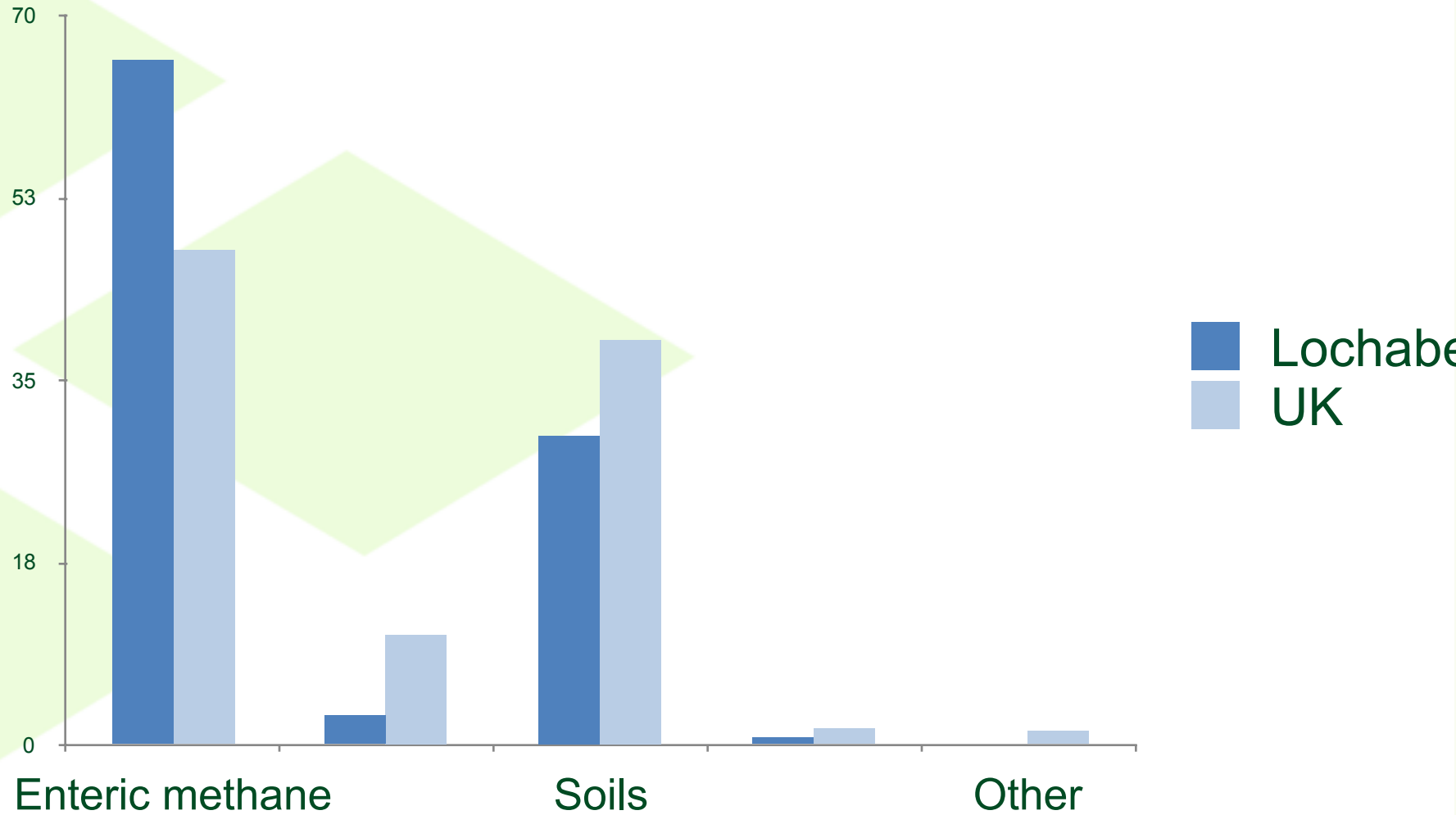
	Hectares
- Cereals	0.3
- Potatoes	1.99
- Fodder crops	15.7
- Other	5.1
- Vegetables for humans	9.4
- Fruit	0.64
Total	37.75

Agricultural emissions 2012 CO₂et

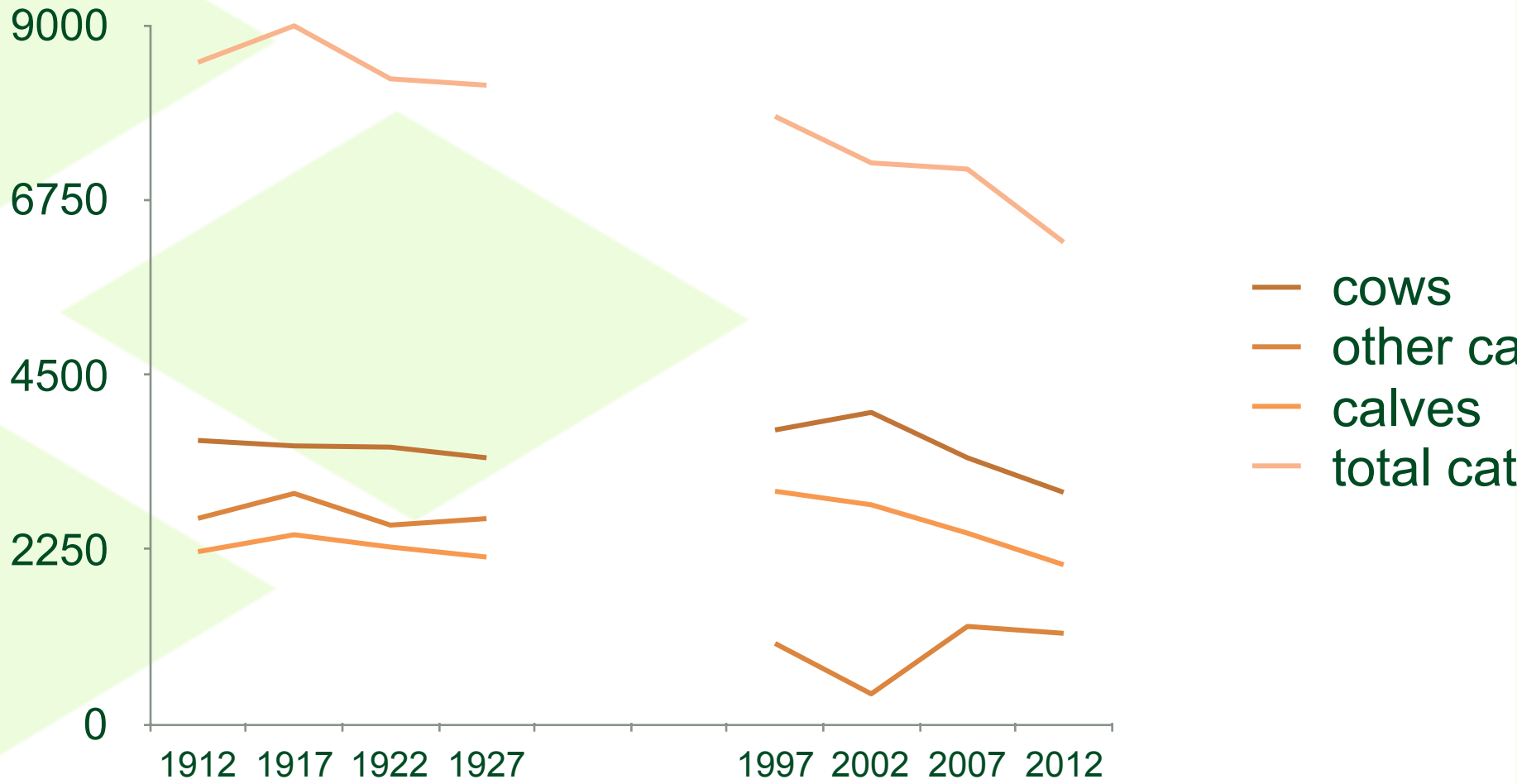


- Animals Enteric
- Animals Manure methane
- Animals Manure management
- Soils direct
- Soils Pasture deposits
- Soils indirect
- Liming

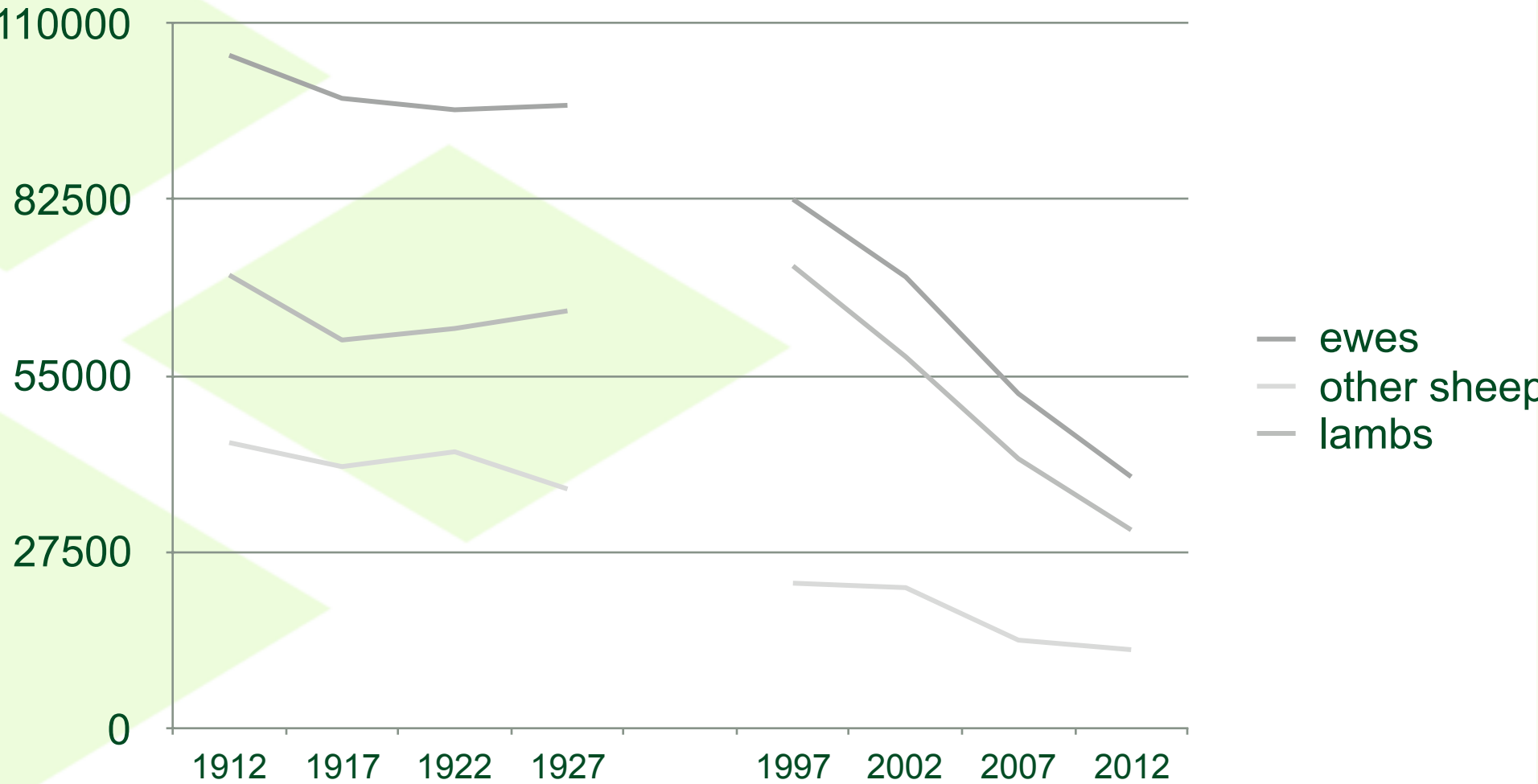
Comparison with UK results



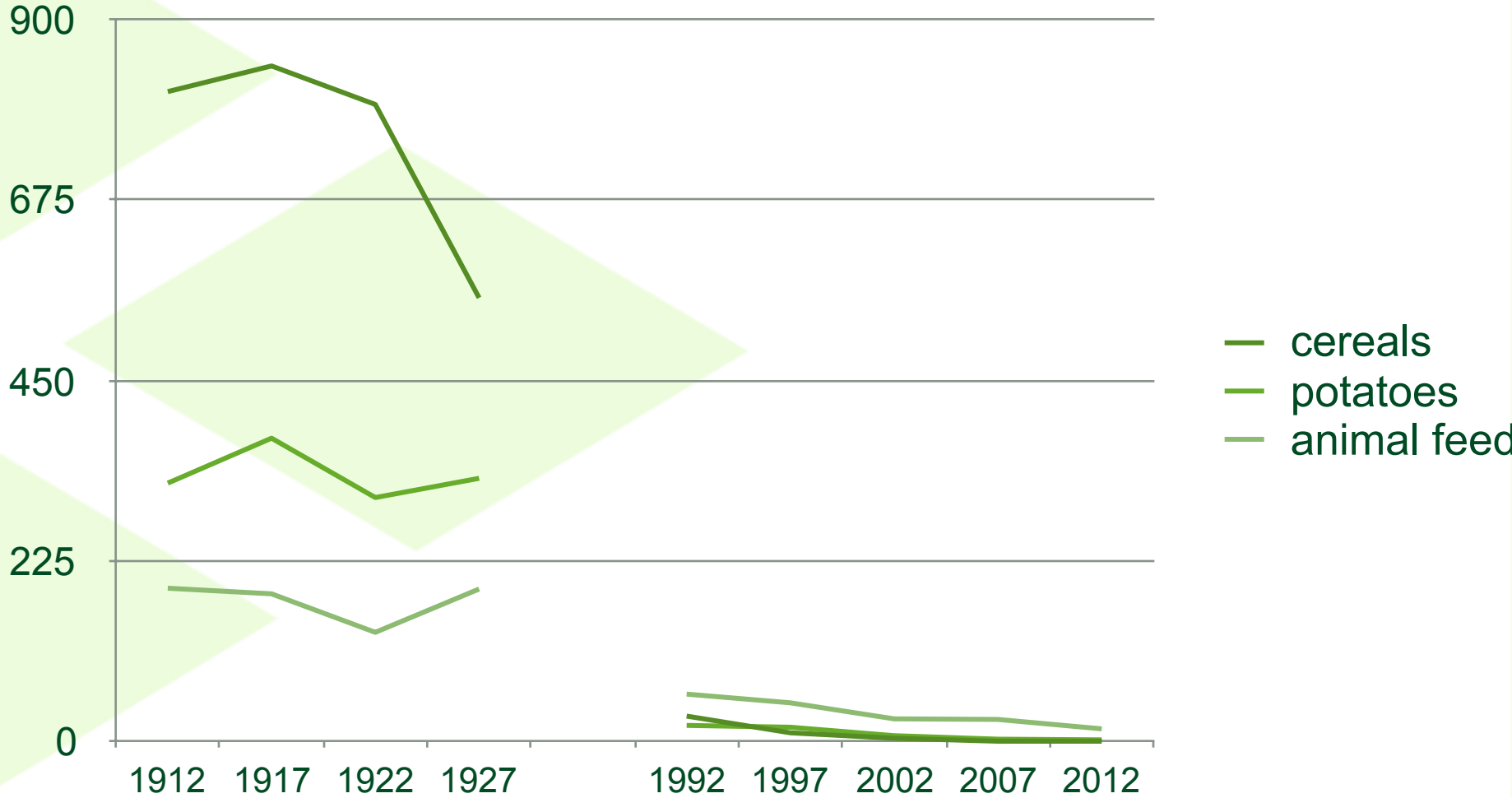
Cattle Numbers Lochaber 1912-27 and 1997-2012



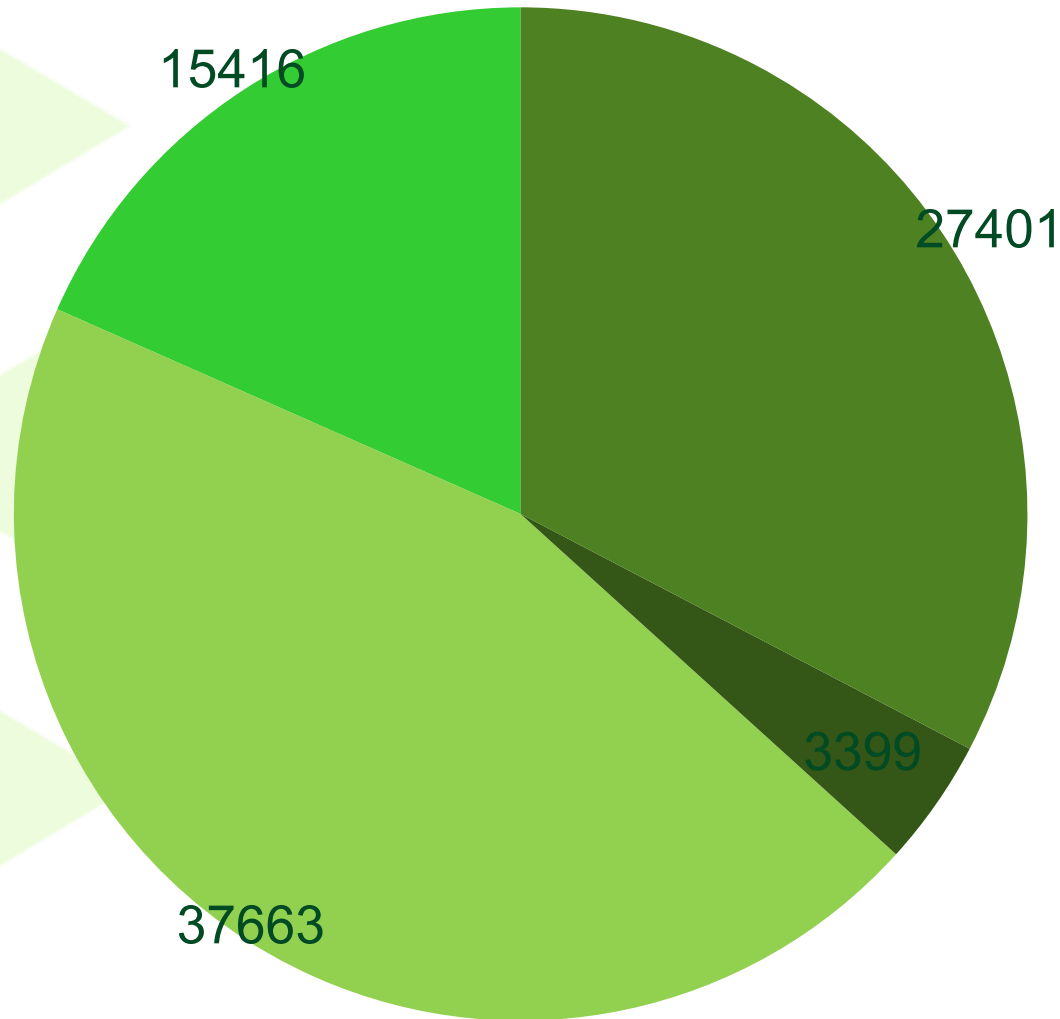
Sheep numbers Lochaber 1912-27 and 1997-2012



Crop production Lochaber 1912-27 and 1992-2012 Hectares



Lochaber Forest land 2011 ha



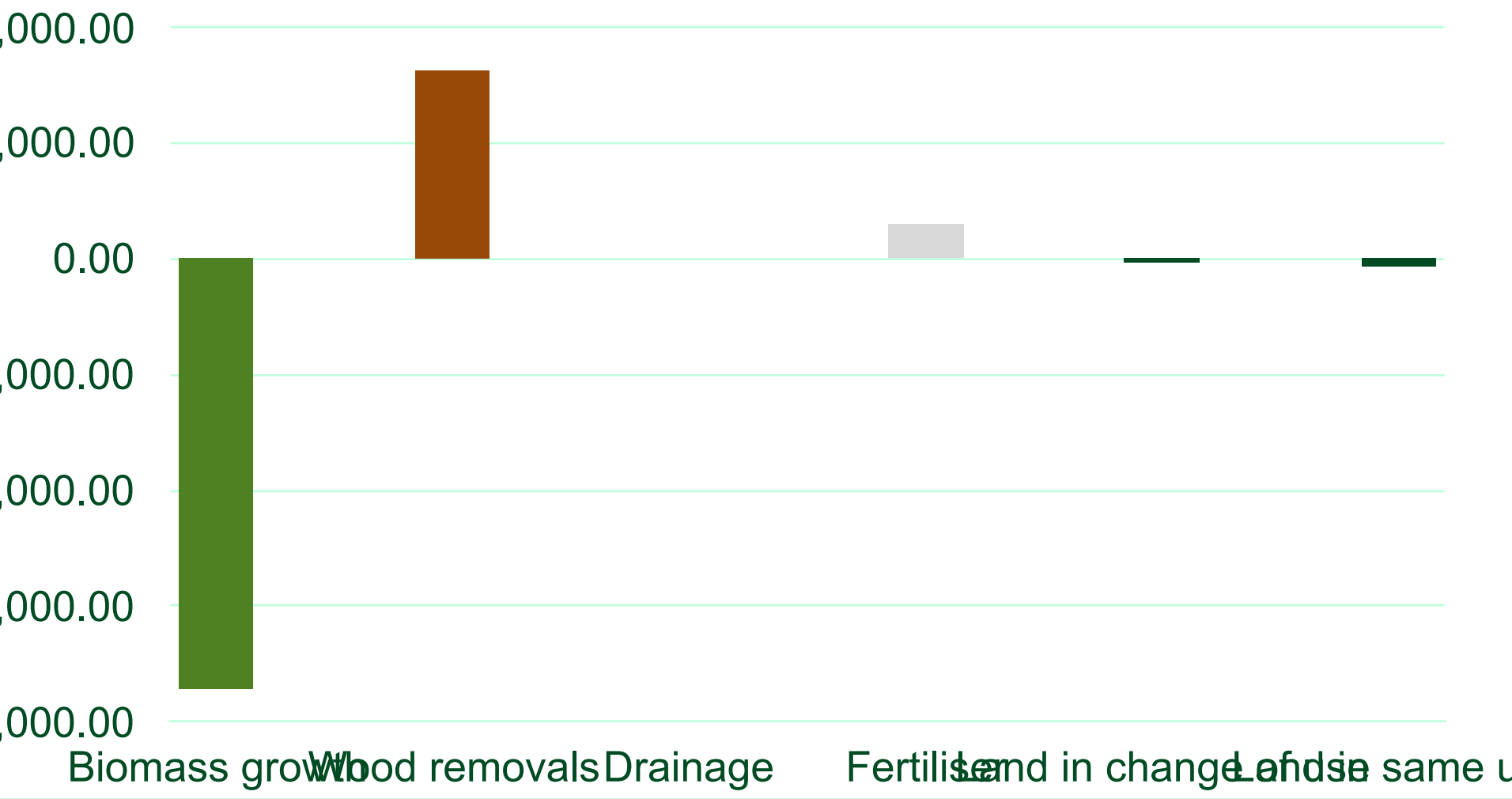
- Conifer FC
- Broadleaf FC
- Conifer other
- Broadleaf oth

Forestry



- Biomass growth
 - Species and age
 - Yield class tables for annual growth
 - BEF and stem to root ratio
- Harvest
- Wood products

Land Use emissions Lochaber 2012 t CO₂e



Land use change



1992-2012

To\From	Woods	Crops	Grassland	Settlement	Other	Total 2012
Woods	61549	0	22329			83878
Crops	0	123	0			123
Grassland	0	547	363436			363983
Settlement	0		364	728		1092
Other	0	0	0		16557	16557
Total 1992	61549	670	386129	728	16557	465633

Land use change 1912-1992



	1912	1992	Source	LUC
Forest land	10,148	61,549	JAC/LCS88	51,401
Arable	1354	670	JAC	-684

Table 6 Land use change Lochaber 1912 and 2012

Land use change



UK National Inventory

Factors for land use change

- Grassland to forest land 47tC/ha
- Cropland to grassland 88tC/ha
- Grassland to settlement -187tC/ha

Conclusions



- Importance of understanding, protecting and enhancing carbon resource
- How much forestry should we have?
- Should we grow more of our own food?

Thanks for listening