

Metadata

1. Context

This research forms part of the Natural Environment Research Council (NERC) programme on Droughts and Water Scarcity, funded through the Historic Droughts and MaRIUS projects (grant references NE/L010070/1 and NE/L010186/1, respectively). The aim of this work was to get a deeper understanding of how past droughts have affected UK agriculture, how farmers have managed droughts and how this management has evolved over time, and what aspects could be improved for a better drought management in the agricultural sector in the future.

As part of the research, 15 growers in the Anglian region were invited to participate in an interview. Those farmers were selected among the ones that previously participated in an online survey sent to UK Irrigation Association members in December 2014 (in Section 5 of this document there is a copy of the online questionnaire).

2. Description of the data

This dataset contains the transcripts of interviews with irrigators in the Anglian region (UK) carried out between February 2015 and March 2016. A total of 15 growers participated in this study (nine face-to-face and six by phone). The interviews were recorded, transcribed and carefully anonymised. A copy of the interview protocol can be found in Section 4 of this document. Questions were open-ended to derive an in-depth understanding of decision processes at the farm level to cope with droughts, and to elicit information on farmer memories from past drought events.

Each file contains the transcripts of one interview with a grower. On the front page there is information regarding the name of the interviewers, the date and the region (NUTS3)¹ where the farm is located. Then, the whole interview transcript is available. Only those details that could lead to the identification of the participant or any confidential comment (as stated by the participant during the interview) have been removed.

3. List of acronyms

Here is a list of acronyms used in the interview transcripts:

- EA: Environment Agency
- IDB: Irrigation Drainage Board
- NFU: National Farmers Union
- S57: Section 57 of the Water Act
- UKIA: UK Irrigators Association
- WAG: Water Abstractors Group

¹ NUTS: Nomenclature of Territorial Units for Statistics. It is a geocode standard for referencing the subdivisions of countries for statistical purposes.

4. Interview protocol

Introduction

1. **In the online survey you gave us some details about the crops that you grow, the size of your farm, etc., but could you tell us a little bit about your story in the farming business?**
 - a. For how long have you been in this business?
 - b. Always same crops? Changes from rainfed to irrigated agriculture?

"The next questions are going to be related to past droughts in order to better understand how drought management can be improved to deal with future events..."

Memories from past droughts

2. **You said that your business activity was affected by the drought (the first drought he/she mentioned in the online survey). What else could you tell us about it?**
 - a. Duration, timing, etc.
 - b. Losses?
 - c. Any management action?
3. **What memories would you like to share with us about other drought episodes that affected your business?**
 - a. Which drought?
 - a. Duration, timing, etc.
 - b. Losses?
 - c. Any management action?
4. **I can see in the online survey that you suffered some abstraction restrictions during past droughts. We would like to know more about how Section 57 has affected your business?**
 - a. How section 57 is applied? Triggers, amount of notice (is it transparent, fair, ...?)
 - b. Information for growers about restrictions
 - c. Ability to negotiate with EA if restrictions/bans applied?

5. Your production is mainly for (processing/supermarkets/local farmers' market/exports/other). How the impacts of a drought episode on crop production could have affected them and other actors in between?

- a. Impacts on other agents of the supply chain
- b. Problems
- c. Ways of negotiating

"Now, we are going to ask you a few questions related to drought management at the different levels, and ways of improvement..."

Drought management

6. You said in the online survey that your main strategies during a drought are.....Could you describe how is the decision process during/after a drought about which on-farm strategies to implement to cope with it?

- a. How to choose among them?
- b. Triggers and timing for implementation?

7. Would you consider that your attitude towards drought risk have changed after being affected by several drought episodes?

- a. Any strategies at the beginning of the season (ex ante, prevention strategies), when you don't know how the year is going to be (wet, dry)?
- b. Any long-term management actions taken? changes in crop mix (more resistant to drought), building reservoirs

8. What would you do, in terms of drought management, if droughts (or abstraction restrictions) become more frequent and/or severe?

- a. Changes in drought management strategies?

9. How did governmental bodies and farmers associations support farmers in drought management and which aspects could be improved?

- a. Environment Agency
- b. UKIA, NFU
- c. WAG

10. How do you perceive drought management in the UK has evolved over time?

- a. At the national level (related to agriculture)?
- b. At the regional/local level?

c. At the farm level?

11. In the online survey, you said that the water management aspects that should be changed to reduce the impacts of future droughts in the UK irrigated agriculture are: Could you explain us why do you believe these are the most important issues to be improved and how can be achieved?

Final questions

12. In your opinion, what can be learned from previous drought episodes in the UK?

a. what things do you believe could have done better in relation to drought management in previous events?

13. Would you like to add anything before concluding this interview?

5. Online questionnaire

Q1. Farm postcode:

Q2. Farm size

Total farm size (ha)	
Proportion that can be irrigated (in %)	
Proportion that was irrigated in 2014 (in %)	

Q3. Which crops do you grow and what are their average yields?

Please tick all that apply

Crops	Rainfed	Irrigated	Rainfed average yield (tonnes/ha)	Irrigated average yield (tonnes/ha)
Maincrop potatoes				
Early potatoes				
Vegetables				
Cereals				
Sugar beet				
Grass				
Small fruit				
Orchard fruit				

Q4. From which water sources do you get the irrigation water from?

Please ensure the total =100

	%
Surface Water (including ponds, lakes, gravel or clay workings, rivers, streams or other water course)	
Ground Water (including wells, bore holes and springs rising on the holding)	
Public mains water supply	
Rainwater collected on site	
Re-use of water from other purposes	
Other (please specify):	
TOTAL	100

Q5. What type of abstraction licence do you have for irrigating your crops?

Please tick all that apply

- All year abstraction
- Winter-only abstraction
- Summer-only abstraction

Q6. What irrigation method(s) do you use? Please, give the answer in % of irrigated area

Please ensure the total =100

	%
Static or hand-moved sprinklers, spray lines	
Hose reels with rain guns	
Hose reels with booms	
Centre pivots or linear moves	
Trickle or drip	
Other(s) (please specify):	
TOTAL	100

Q7. How do you decide when and how much to irrigate?

Please ensure the total =100

	%
Water balance calculation (by hand, computer)	
In-field soil moisture measurement	
Judgment (feeling the soil, crop inspection,...)	
Other(s) (please specify):	
TOTAL	100

Q8. What is the final destination for your products?

Please tick all that apply

	Local farmers' market	Processing	Supermarket	Exports	Other
Maincrop potatoes					
Early potatoes					
Vegetables					
Cereals					
Sugar beet					
Grass					
Small fruit					
Orchard fruit					

Q9. Has your production (yield and/or quality) been affected by any drought episode over the last few decades?

Please tick the drought period(s) below that affected your business and estimate the impact level in each case

	No impact	Low	Medium	High
1976				
1988-1992				
1995-1997				
2003				
2004-2006				
2010-2012				
Other event (please specify the year(s)):				

Q10. For the most recent drought episode in which your business was affected, what was the typical yield reduction compared with average yield for your most important crops?

Please provide an estimate in % or tonnes per ha, whichever is easiest

Crop type	Yield reduction (%)	Yield reduction (tonnes/ha)

Q11. Similarly, for the most recent drought episode, what were the typical impacts on farm-gate prices?

	No effect	Slight increase in price (less than 5%)	Moderate increase in price (5 to 10%)	High increase in price (more than 10%)	Slight decrease (less than 5%)	Decrease of more than 5%
Maincrop potatoes						
Early potatoes						
Vegetables						
Cereals						
Sugar beet						
Grass						
Small fruit						
Orchard fruit						

Q12. During/after a drought, did you experience any contractual/supply problems?

- No problem experienced
- Yes, I achieved a lower price for my product
- Yes, I did not achieve the agreed production as stipulated in the contract
- Yes, because of quality issues
- Yes, other reason(s) (please specify):

Q13. Have you experienced any abstraction restrictions during recent droughts?

	Yes, voluntary restrictions	Yes, mandatory restrictions	Yes, mandatory bans	No restriction
1976				
1988-1992				
1995-1997				
2003				
2004-2006				
2010-2012				
Other event (please specify the year(s)):				

Q14. What source(s) of information did you use during the most recent drought to raise your awareness?

- TV/Radio
- Newspaper
- Met Office website
- Environment Agency website
- Grower levy board (AHDB)
- Producer organizations (PO)
- Other source(s) (please specify):

Q15. What strategies do you implement when a drought has been declared and abstraction restrictions are likely?

Please tick any of the actions that are relevant to you in the left-hand column.

In the right-hand column, please tick two actions that you consider to be of highest importance.

		Top 2
Abstract to maximum to get soil water contents up		
Irrigated a reduced area to their full irrigation schedule		
Irrigate the full area to a reduced irrigation schedule		
Irrigate at night		
Renegotiate existing supply contracts		
Develop a drought management plan		
Evaluate water resource position		
Personally negotiate with EA		
Work with local Water Abstractor Group to negotiate with EA		
Seek informal water trades		
Other(s) (please specify):		

Q16. After the last drought episode, did your business make any changes in farm management to cope with future drought risks?

- No
- Yes, investment in alternative water sources to reduce risk (e.g. reservoir)
- Yes, changes in the crop mix or varieties to make them more resistant to droughts
- Yes, development of a business drought plan
- Yes, other change(s) (please specify):.....

Q17. In your opinion, what water management aspects could be changed to reduce the impacts of future droughts on the UK irrigated agricultural sector?

- Removal of Section 57 restrictions
- Implement a national crop insurance system
- Encourage water trading within the agricultural sector
- Improve information and forecasting of drought impacts for farming community
- Give farming sector a more central role in catchment water management
- Other(s) (please specify):

Q18. On a scale of 0 to 10, how do you rate drought risk to your farm business? 0 is 'not important at all', and 10 is 'very important'.

- | | | | |
|-------------------------|-------------------------|-------------------------|--------------------------|
| <input type="radio"/> 0 | <input type="radio"/> 3 | <input type="radio"/> 6 | <input type="radio"/> 9 |
| <input type="radio"/> 1 | <input type="radio"/> 4 | <input type="radio"/> 7 | <input type="radio"/> 10 |
| <input type="radio"/> 2 | <input type="radio"/> 5 | <input type="radio"/> 8 | |

Q19. Do you think droughts and water scarcity are likely to become more frequent in the future in the UK?

- No
- Not sure
- Very unlikely
- Likely
- Highly likely

Q20. Most growers are willing to invest in drought risk management strategies, but which options are more relevant to your business?

- No, not willing to invest in drought management strategies
- Yes, modernization of irrigation equipment is a priority
- Yes, an on-farm reservoir provides the greatest security
- Yes, changing soil and crop management practices (tied-ridging, mulching, better soil management, switching to more drought tolerant varieties)
- Yes, other(s) (please specify):

If you have any other specific comments relating to drought impacts on your farm or policy actions needed then please provide further information below

Growers interviews in the Anglian Region 2015 – Transcripts

Please provide your contact details if you wish to receive a summary of the results or are willing to further contribute to these projects.

This data will be used only for these purposes. Your answers will be still anonymous

- I would like to receive a summary of the results

- I am willing to further contribute to these projects (You may be contacted in order to know more about your experience dealing with droughts).

First name	
Last name	
Email address	
Mobile number	