qualtrics XM + Department of Primary Industries
Department of Regional NSW

NSW GOVERNMENT

Seasonal Conditions Reporting, Monitoring and Forecasting Survey Report

Climate Branch | NSW Department of Primary Industries

October 2022

Department of Primary Industries

Research Summary

Background & Methodology

The NSW Department of Primary Industries through the Future Ready Regions strategy aims to further develop the Enhanced Drought Information System (EDIS). To aid in this project, DPI engaged Qualtrics to help design a research study to understand the key needs of various stakeholders.

Survey Purpose

Identify and understand various stakeholders' informational needs and preferences in order to develop and refine current DPI service offerings to the community.

The key focus of this report will be to:

1. Understand the stakeholder's most preferred sources of information and support (awareness, usage & efficacy)

2. Identify key informational needs in relation to understanding and forecasting **extreme seasonal conditions** (including drought and floods)
   a. Uncover what activities are most impactful in providing better understanding of **extreme seasonal conditions**

3. Identify key decision outcomes and actions in relation to drought forecasting, preparation and management

4. Understand key communication preferences (channel, frequency) by key information sources

Methodology

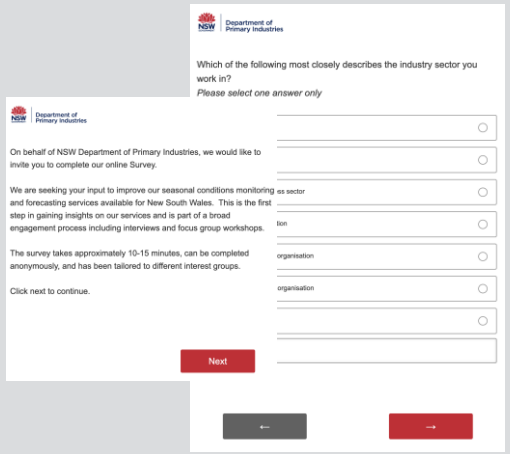
Survey Length
10-15 minutes

Survey Dates
May 2 – Sept 1, 2022

Sample
- 253 respondents
- NSW farmers (landowners, land managers), government employees and other interested stakeholders of DPI Drought Monitoring and Services

Sample Cuts
- Occupation (Landholder vs Non-landholder)
- Local Land Services Region

Online Survey



- **Distribution Method**
  (published via multiple channels, see below)
  - Anonymous Survey link
  - QR Code
- **Distribution Channels**
  - SSU subscribers
  - Direct contact through networks in the agricultural, government advisory and assistance sectors
  - NSW DPI media and social media
  - NSW Print media (newspapers)
  - Attendance at field days and other public events

Sample Composition

Target Customer Segment Definition

NSW farmers (landowners, land managers), government employees, other interested stakeholders of DPI's Seasonal Conditions Monitoring Services including users of other climate/weather services and products.

Survey Dates:
May 2, 2022 – Sept 1, 2022

Gender	n	%
Male	159	63%
Female	82	32%
Non-binary	1	0%
Prefer not to say	11	4%

Age Group	n	%
20 to 29	6	3%
30 to 39	27	12%
40 to 49	42	18%
50 to 59	70	31%
60 to 69	51	22%
70 to 79	27	12%
80 or over	5	2%

Occupation	n	%
Landholder	163	64%
Government Employee	56	22%
Public or Private business sector	12	5%
Other	10	4%
Education or Research organisation	6	2%
Charity or Membership organisation	6	2%

Overall Sample Size: n=253 respondents

LLS Region*	n	%
North Regions	**65**	**26%**
North Coast	54	21%
Northern Tablelands	11	4%
Western Regions	**60**	**24%**
North West	19	8%
Central West	30	12%
Western	11	4%
Hunter, Central Tablelands & Greater Sydney	**51**	**20%**
Hunter	11	4%
Central Tablelands	30	12%
Greater Sydney	10	4%
Riverina & Murray	**41**	**16%**
Riverina	30	12%
Murray	11	4%
South East	**28**	**11%**

*For a more robust statistical analysis and comparison, adjacent regions were grouped together to ensure there is a sample size of at least n=50 per group (if possible).

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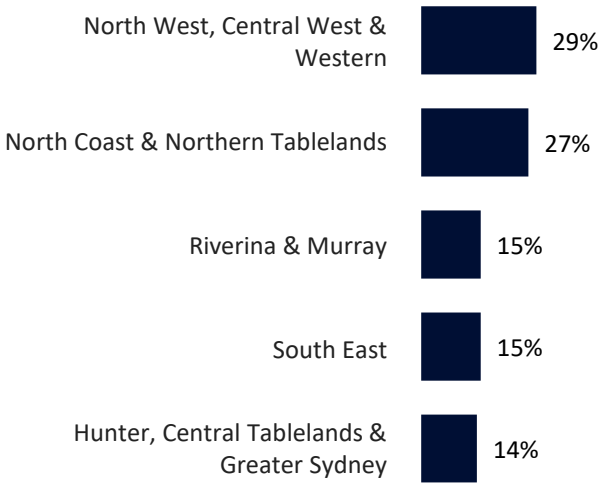
Demographics – in Detail

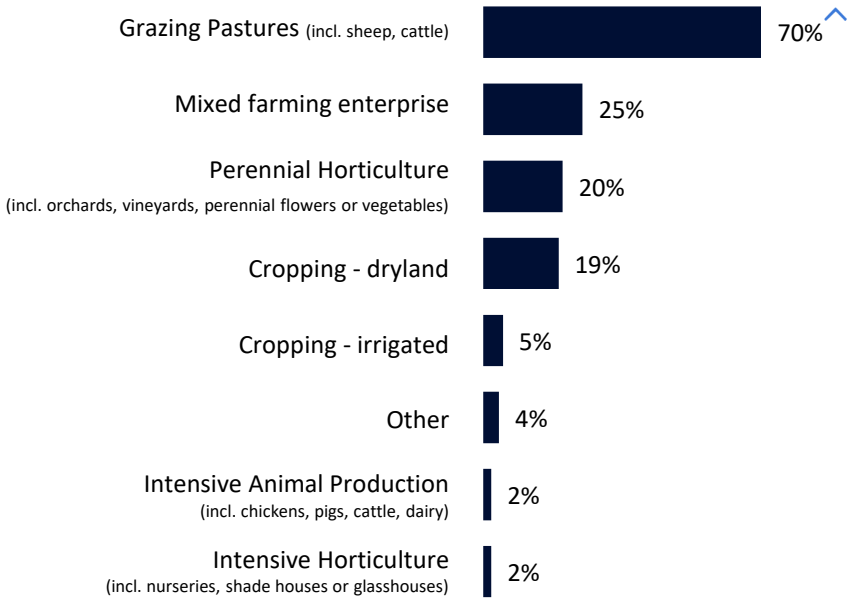
Demographics - Landholders

- The landholders who participated in this research are mostly from the Northern parts of NSW. Majority of them (70%) graze pastures and have been farming for over 25 years.

Local Land Services Region



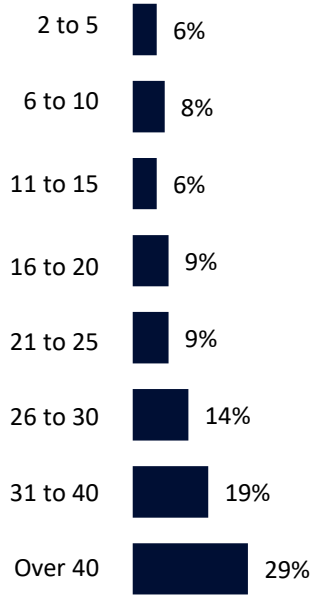
Farm Type



Average number of years farming:

31 years

Length of time farming



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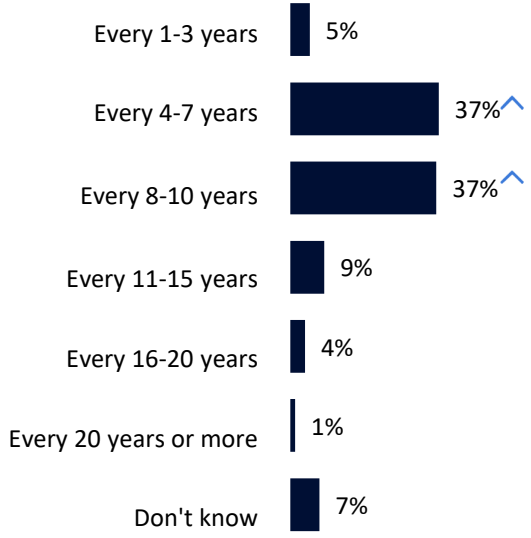
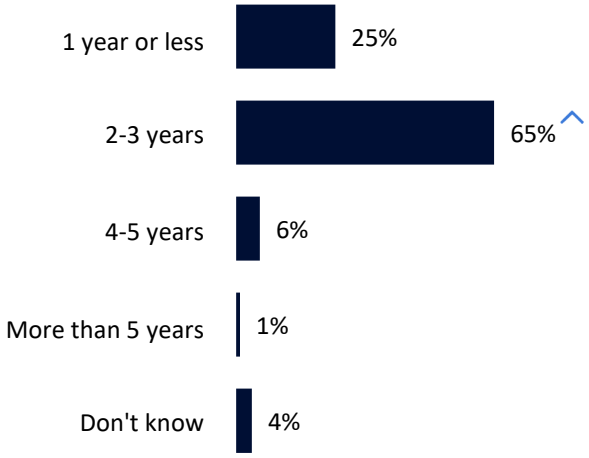
Demographics – Landholders (Drought Experience)

- Two in five (37%) landholders have experienced a major drought every 4-7 years and another 37% every 8-10 years. The typical length of drought experienced lasted 2-3 years. However, it seems that a meaningful proportion of the respondents (44%) is only prepared for up to 1 year of drought. This is interesting especially since 72% of droughts experienced by the respondents spanned 2 years or more.

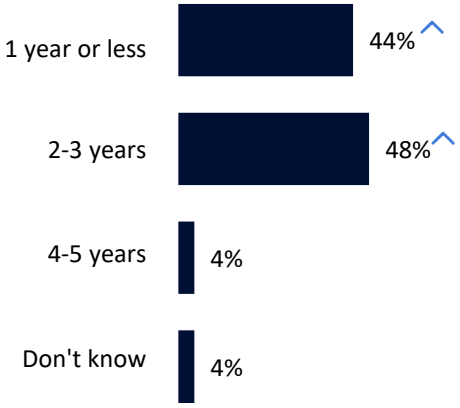
Frequency of experiencing Drought Conditions



Typical length of Drought Experienced



Current level of preparedness (in number of years)



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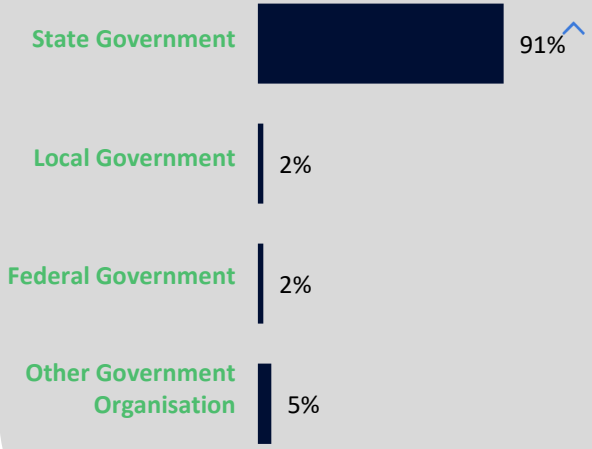
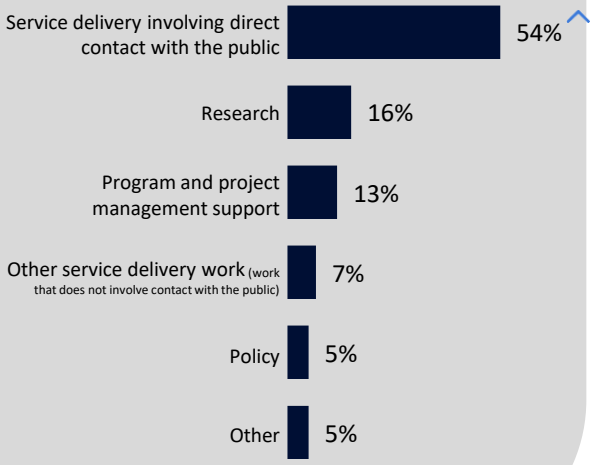
Demographics – Government Employee & Public/Private Business Sector

- Majority of government employees work for the State Government and have roles that involve service delivery involving direct contact with the public.
- Five of the twelve respondents from the Public/Private Business sectors have roles in Farm Advisory, agronomist, extension, specialist.

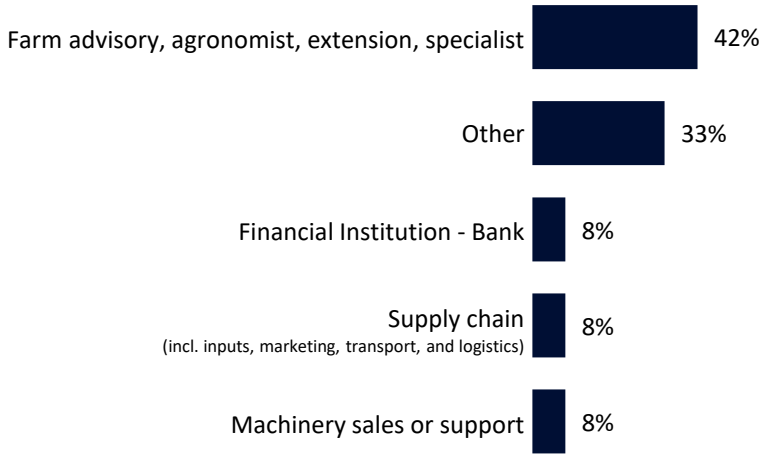
Government Organisation (Government Employee)



Type of Work (Government Employee)



Type of organisation (Public/Private Business Sector)



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Key Findings & Recommendations

Key Findings

Main sources of current climate information

The **Bureau of Meteorology (BoM)** website is by far the most known and used source of climate and weather information – used by around 4-in-5 (85%) respondents. The **DPI cimate website** provides information on Seasonal Conditions and Drought and is used by 20% of respondents, mostly government employees.

The **NSW State Seasonal Update**, **Interactive Combined Drought Indicator (CDI)** and **Drought Hub** are the most known DPI climate services. Current usage is low (at the time of the survey), but this is expected as these products are geared around drought response (NSW is currently not in drought and experiencing flooding across several regions).

Amongst all DPI climate services the **NSW State Seasonal Update** is the most highly regarded – especially in the *Central Tablelands + Greater Sydney + Hunter Regions.*

Opportunities identified

More localised reporting and data collection

Users of the **NSW State Seasonal Update** and **Interactive Combined Drought Indicator** mentioned often the need of localised forecasts aided by data collection from farmers themselves or local staff.

The User Experience

Respondents frequently mentioned the need to make accessing data/information from the website/App easier, straightforward and interactive (e.g., clickable maps, and time-series charts, etc.). With some wanting the ability to export the data for personalised analysis.

Improve Formatting of Information Provided (make it easier to read and understand)

Tailoring the language used on the website/App based on the audience/users of the information – in the words on one respondent “Less government styled language”. Furthermore, formatting the website/App to include data or visualisations that are easy to interpret and maps that are easy to navigate and view.

Demonstrate and communicate the impact of the data to users

Several respondents mentioned wanting DPI to include information on the impact of its data/updates on users. For example, landholders would like to gain further understanding on how to interpret seasonal updates & climate models, including learning management practices by others to be better prepared for extreme weather conditions.

Key Findings

Main Informational Needs

Seasonal rainfall forecasts (3 months ahead), Weather forecast (5-10 days ahead) & Weather forecast (1-2 days ahead) are the Top 3 most relevant information for the respondents, with the latter 2 being significantly more relevant to landholders than government employees.

For landholders, better information would improve their ***farm management practices,*** allow them to better ***manage climate extremes*** and be more ***prepared for droughts and floods.***

Meanwhile, among respondents who did not identify as landholders (e.g., Government or private/public employees, etc.) better information would enhance their ability to ***incorporate climate information into project and risk management design***.

Key Communication Preferences

Digital formats like **Email**, **DPI website** and **Apps** are the most preferred channels of communication.

The preference for **email**, **websites** or **apps** varies across age groups represented in the survey responses.

Across all users of DPI climate services, receiving information based on an **LGA level** is most preferred and most useful when making decisions about managing extreme seasonal conditions.

Especially among those who used **NSW State Seasonal Update**, LGA level is perceived to be most useful compared to other levels (e.g., state-wide overview, farm level, parish, etc.).

Key Findings

Key Actions taken to manage extreme seasonal conditions

Two-in-five (39%) landholders ***sold stock to reduce numbers*** as their primary action during the most recent drought. While 1-in-4 (24%) landholders, ***maintained groundcover to prevent wind and water erosion*** as their primary action.

During drought, landholders are most likely to sell livestock as on-farm feed availability decreases and prices increase for alternative sources. A quarter of landholders would also take preventative measures to limit erosion caused by dry weather.

Two-in-five (37%) Government & Public/Private Employees recommended to their clients to ***seek advice from specialised agencies***. While 1-in-3 (34%) recommended to their clients to ***maintain groundcover to prevent wind and water erosion.***

Examples of agencies recommended were NSW DPI, Local Land Services, Rural Financial Councillor, Rural Assistance Authority or Rural Resilience Program

Drought Preparation Barriers

Drought preparation is mainly hindered by the lack of ***confidence in the climate or weather data***

Among landholders in the Central West + North West + Western regions, there seem to be a greater **lack of confidence in climate or weather data** and **lack of localised climate or weather data** than other regions.

Additionally, amongst Government, Private/Public employees the ***timeliness of information*** also prevents them from providing better advice to their clients related extreme seasonal conditions.

Key Recommendations

Increase the promotion of NSW DPI Seasonal Conditions Monitoring Program, including its products and services

Promote DPI climate services through key channels where the users will most likely be reached. For example: direct emails, direct contact through agricultural or government networks, media (print, digital and social), etc. Some users mentioned hearing about the resource through a recent online conference.

Enhance the information sent through digital channels like email, website and app

Communications sent through emails, website pop-ups and app notifications should be impactful to encourage further usage. For instance, email communications could be tailored to address the most current concerns of landholders and/or government employees.

Importantly, tasks like ensuring that the emails are rendering properly on multiple device types can help ensure that the users can fully engage with the information within the email.

Opportunities to improve DPI services, especially in the key areas below:

Tailored Content
Ensure that the information and data are formatted in such a way that is easily accessible and understandable by the key audiences. This includes usage of language and terminologies that is more familiar to your key audiences.
Furthermore, a greater emphasis on explaining some of the science behind DPI products (e.g., CDI, etc.) plus outlining their direct impact on the users will improve confidence on materials published by DPI.

And lastly, thoughtful inclusion of maps, charts and tables should enhance the ability of the user to comprehend the message of the content.

User-centric Experience
Ensure that the user's navigation throughout the website/app is seamless and intuitive. Adding the ability to export data from the website/app will allow users to perform their own analysis and allow those users with limited access to the internet the ability to interact with the data offline.

Availability
Ensure that the NSW DPI FarmTracker app can be found and downloaded easily by the users, with one respondent commenting " a farmer will usually only try once to find something like that".

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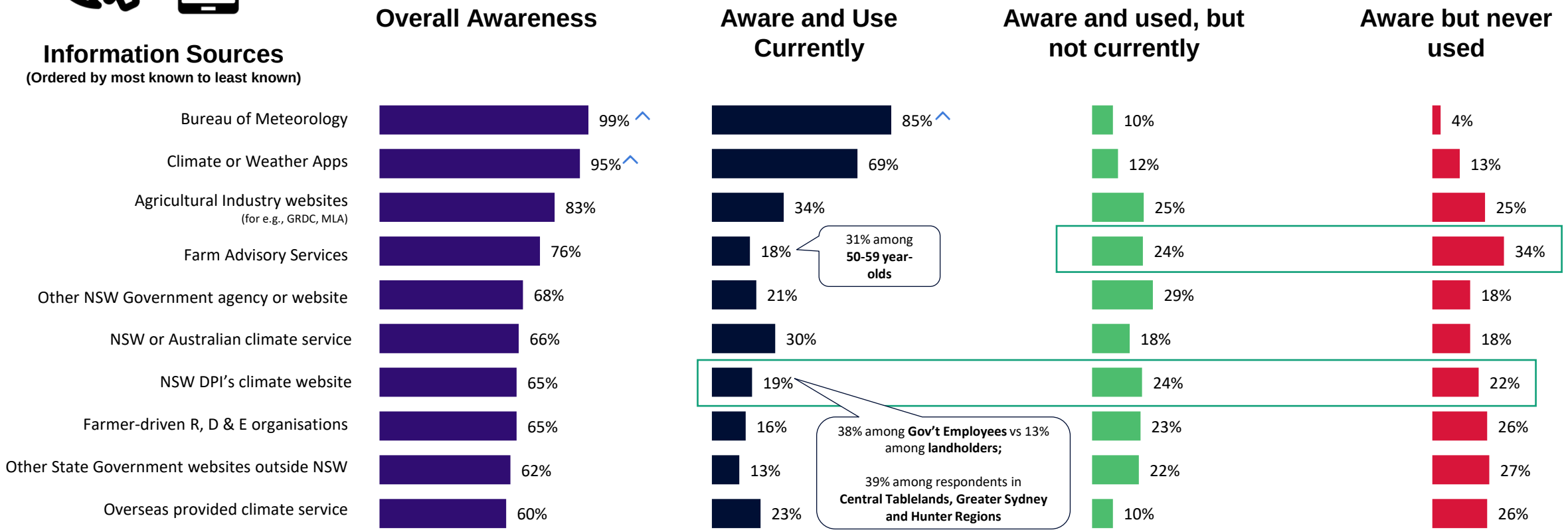
Current Sources of Information and Support

Most known and used Information Sources

- The **Bureau of Meteorology (BoM)** website is by far the most known and used source of information. Followed by **Climate or Weather Apps**.
- Meanwhile, **Farm Advisory Services** is well known but has the lowest usage out of all the information sources tested (34% are aware but never used). According to our segment analysis, this information source is mostly used by *50 to 59 year-olds* and least likely used in the *Central Tablelands, Greater Sydney and Hunter Regions*.
- Introduce measures to increase usage of **DPI's Climate Website**, currently being used by only 1-in-5 (19%) overall. Users are mostly in *Central Tablelands, Greater Sydney and Hunter Regions* (39%) and *government employees* (38%)

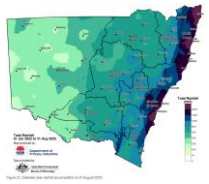
Information Sources
(Ordered by most known to least known)



indicates significantly higher citations vs other choices

Most known and used DPI Services

- The three most known DPI climate services are: **NSW State Seasonal Update, Interactive Combined Drought Indicator** and **Drought Hub**. The latter 2, are not presently being used despite being well known –this is expected as these products are geared around drought response (at the time of the survey NSW is not in drought and experiencing flooding across several regions).
- According to the segment analysis, significantly more government employees use DPI climate services than landholders. Ensure that more landholders are aware of DPI's services and the experiences are also tailored to the needs of landholders.
- Interestingly the **Drought Hub** was used most often in the *Central West, North West, Western Regions* - perhaps due to the severity of the last drought and possibly the advice provided by extension staff in those regions.

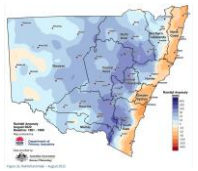


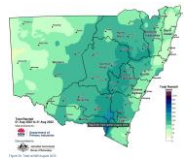
DPI Services (Ordered by most known to least known)	Overall Awareness	Aware and Use Currently	Aware and used, but not currently	Aware but never used	Net Usage (Aware and Use Currently + Aware and used, but not currently)
NSW State Seasonal Update	66% ^	29%	17%	20%	46% — 68% - **Gov't Employee** vs 37% - **Landholders**
Interactive Combined Drought Indicator	64% ^	15%	32%	18%	47% — 59% - **Gov't Employee** vs 39% - **Landholders**
Drought Hub	62% ^	8%	27%	27%	35% — 53% - **Central West + North West + Western Regions**
Seasonal Conditions Information Portal	44%	9%	17%	18%	26% — 43% - **Gov't Employee** vs 21% - **Landholders**
Seasonal Conditions / drought management workshop	43%	2%	17%	24%	19% — No significant differences to highlight between segments
Farm Tracker App	31%	0%	9%	22%	9% — 21% - **Gov't Employee** vs 4% - **Landholders**

^ indicates significantly higher citations vs other choices

Most highly rated DPI Services

- By and large users of DPI services are satisfied, especially with the **NSW State Seasonal Update** where 3-in-4 (75%) cited that they are satisfied with this service. In contrast to the **Farm Tracker App** where only 27% of the 22 users are satisfied with this service.
- Looking at notable differences in perception by usage: government employees are significantly more satisfied with the **Interactive Combined Drought Indicator** than landholders. The **Interactive Combined Drought Indicator** and **NSW State Seasonal Update** are especially well regarded in the *Central Tablelands + Greater Sydney + Hunter* regions.
- No significant differences were observed in preferences amongst gender and age groups.



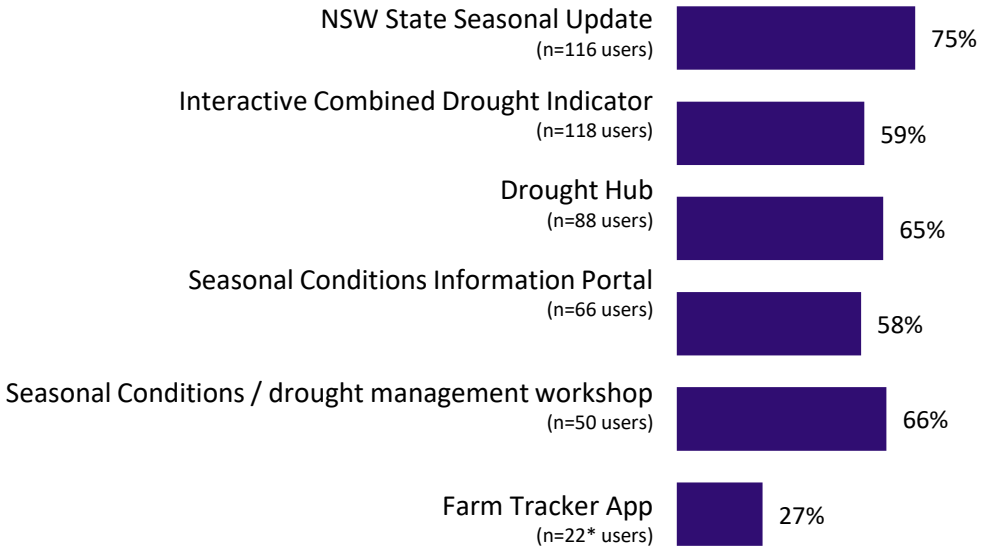


DPI climate services

(Ordered by most known to least known)

% Satisfied

(% Very Satisfied + % Partly Satisfied)



Occupation Type			Local Land Services Region				
Landholder	**Gov't Employee**	**Other**	North Coast + Northern Tablelands	Central West + North West + Western	Central Tablelands + Greater Sydney + Hunter	Murray + Riverina	South East
Base of Users are enclosed in parenthesis ()			**Base of Users are enclosed in parenthesis ()**				
(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F)**	**(G)**	**(H)**
67% (61)	82% (38)	88% (17)	71% (24)	53% (30)	94% **DE** (34)	85% (13)	75% (12)
45% (64)	79% **A** (33)	71% **A** (21)	43% (21)	54% (35)	84% **DEGH** (25)	57% (21)	50% (10)
64% (53)	76% **C** (25)	40% (10)	83% (18)	63% (32)	59% (17)	67% (12)	60% (5)
49% (35)	71% (24)	57% (7)	56% (9)	50% (18)	72% (18)	50% (12)	50% (8)
61% (33)	79% (14)	67% (3)	100% **EH** (7)	44% (16)	80% (10)	78% (9)	33% (6)
14% (7)	25% (12)	67% (3)	0% (0)	22% (9)	22% (9)	50% (2)	0% (1)

The percentages (%) are based on the number of Users (Aware and Use currently + Aware and used, but not currently)
A/B/C, D/E/F/G/H Letters indicate significant difference at 95% level. For example, in the able above the result of 84% Satisfaction with the Interactive Combined Indicator for respondents from Central Tablelands + Greater Sydney + Hunter (in column **F**) is significantly higher than regions in column **D** (North Coast + Norther Tablelands), **E** (Central West + North West + Western, **G** (Murray + Riverina) & **H** (South East).
Bases reflect the total number of respondents to that question. Results from a low base size (n<30) should be used indicatively.

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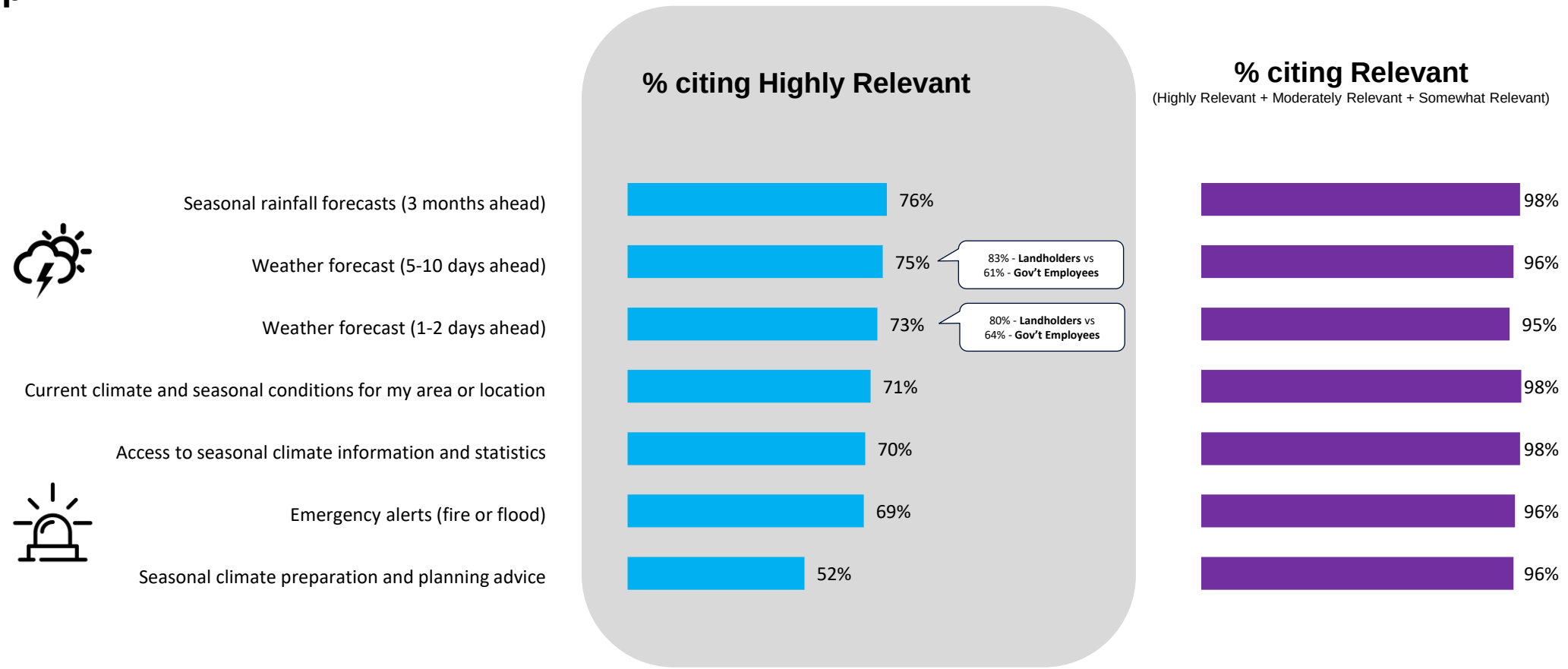
Key informational needs in relation to understanding and forecasting extreme seasonal conditions (incl drought and floods)

Relevant Key Sources of Information

- The top 3 most highly relevant information sources are **seasonal rainfall forecasts** (3 months ahead), **weather forecast** (5-10 days ahead) and **weather forecast** (1-2 days ahead), with almost all (96% and above) respondents finding the **Top 7 sources of information shown below** to be *relevant* to them.
- **Weather forecasts** (1-2 days ahead or 5-10 days ahead) are significantly more important among *landholders* than *government employees*

Top 7



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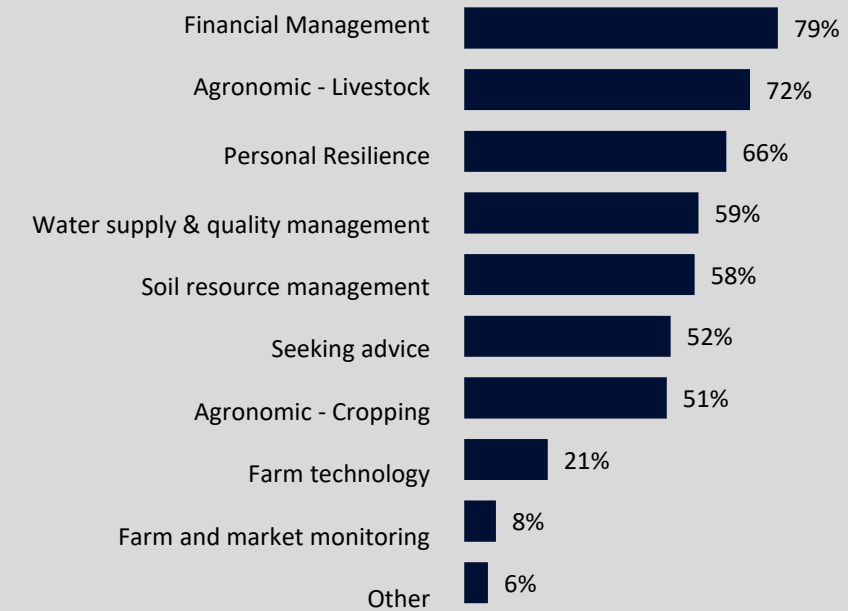
Key decision outcomes and actions in relation to drought forecasting, preparation and management

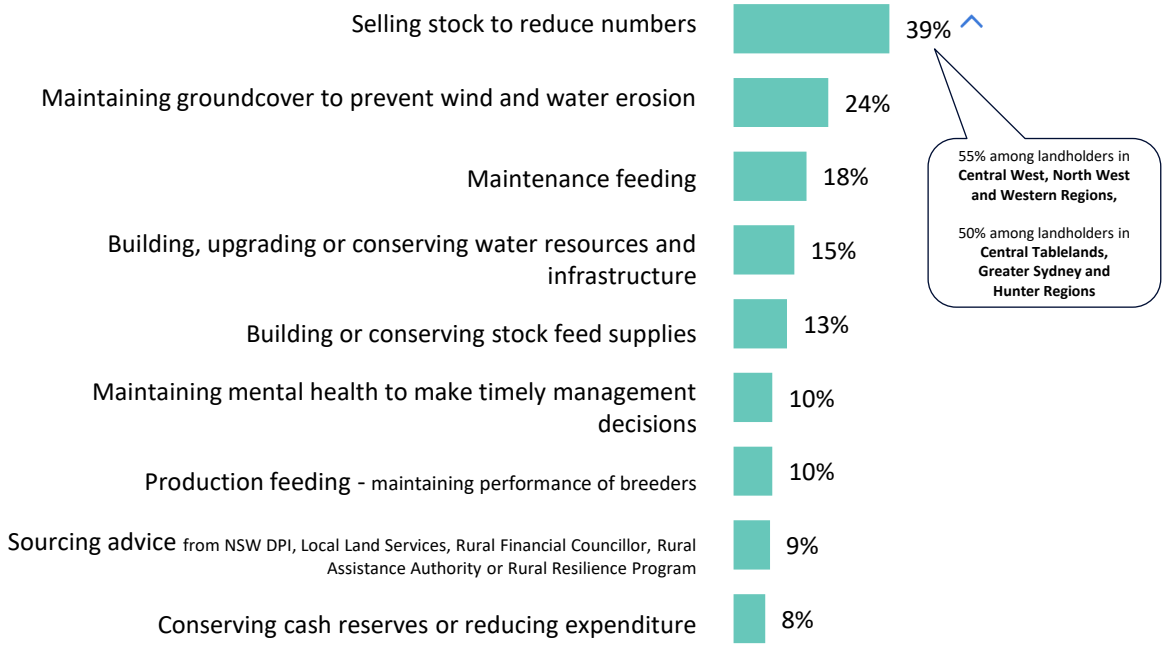
Actions during the most recent drought – Landholders

- Landholders primarily "sold livestock" during the most recent drought, this is followed by implementing soil resource management initiatives like "maintaining ground cover to prevent wind and water erosion".
- Around 1-in-2 landholders in the combined Central West + North West + Western Regions (55%) and combined Central Tablelands + Greater Sydney + Hunter Regions (50%), "sold livestock" during the most recent drought.
- It is interesting to note that although almost 4-in-5 (79%) of landholders indicated undertaking "Financial Management" initiatives, only 8% cited "conserving cash reserves or reducing expenditure" as the most important action they took during the recent drought.

Most cited actions undertaken during the most recent drought (by theme)



Most cited *Primary Actions* undertaken during the most recent drought

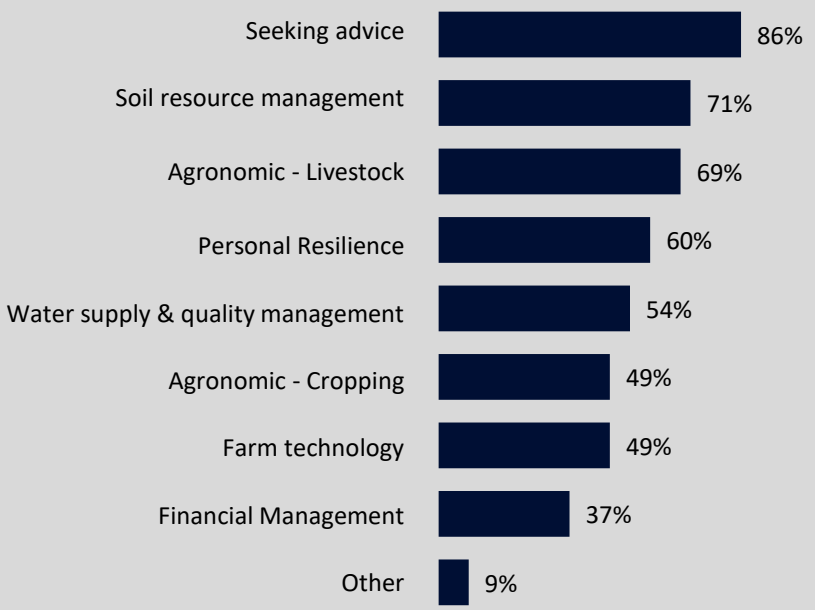


^ indicates significantly higher citations vs other choices

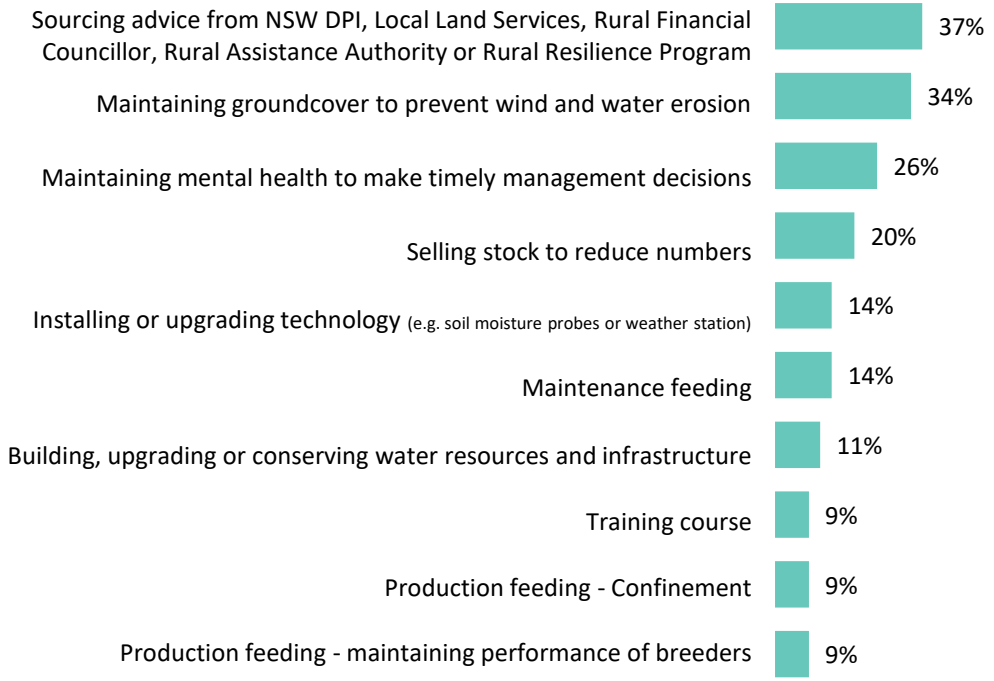
Recommendations during the most recent drought – Gov't & Public /Private Employee

- Government & Public/Private employees mainly recommend their clients to **seek advice (from NSW DPI plus other gov't agencies)** and to **maintain groundcover to prevent wind and water erosion**
- **Maintaining mental health** is also identified as a primary action by 1-in-4 (26%) *Gov't & Public/Private employees*, highlighting the importance of looking after one's well-being during crises.
- Due to the respondent sizes no significant differences were observed between regions for each action type. However, directionally, Government & Public/Private employees based in the Northern regions are more likely to recommend their clients to **seek advice** *(40%+)*, while **maintaining ground cover** would be recommended by those based in *Murray & Riverina*.

Most cited actions recommended during the most recent drought (by theme)

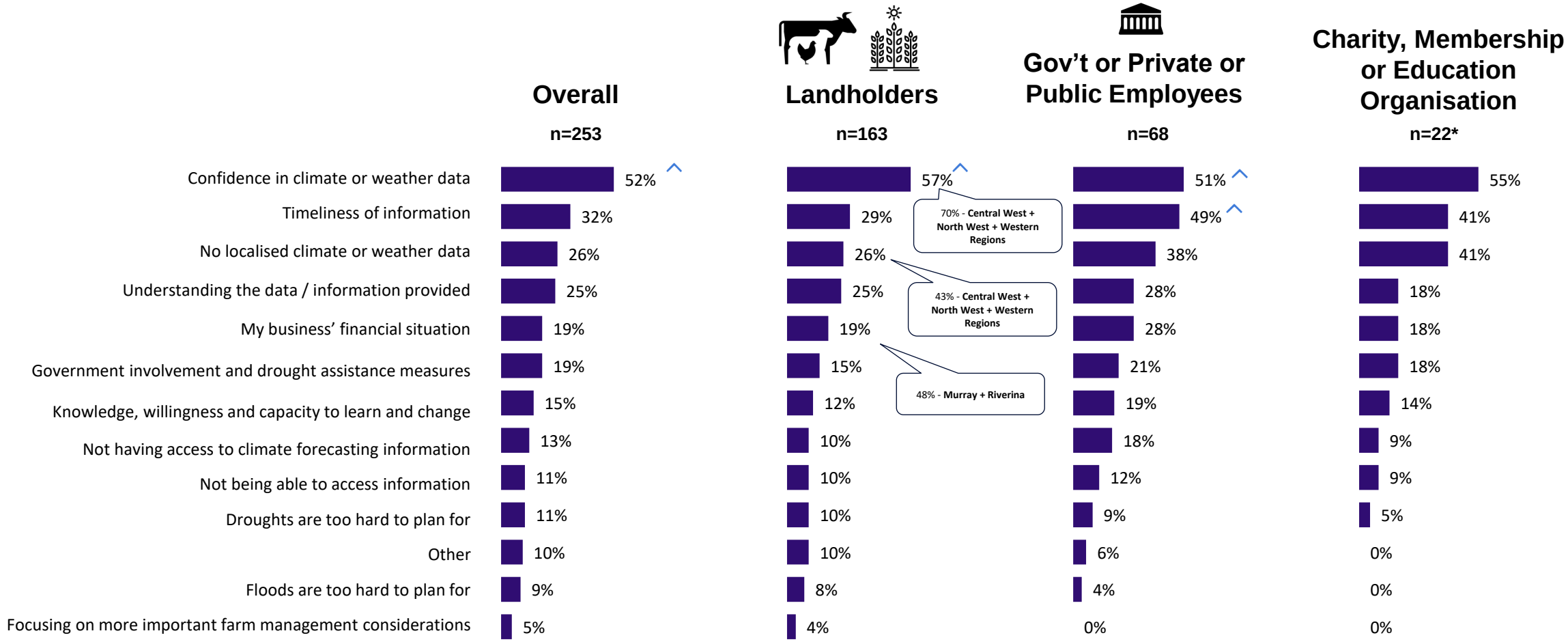


Most cited *Primary Actions* recommended during the most recent drought



Drought Preparation Barriers

- The **confidence in the climate or weather data** is paramount when preparing for extreme seasonal conditions regardless of occupation. Additionally, the **timeliness of information** is also a leading barrier in the ability of Government, Private or Public employees in providing advice to their clients.
- Among landholders in the combined *Central West + North West + Western region*, there seem to be a **lack of confidence in climate or weather data** and a **lack of localised climate or weather data** – more so than other regions.
- Interestingly, around half (48%) of landholders in *Murray & Riverina* cite their **business' financial situation** as their main barrier.



*Use indicatively – Low base size (n<30)

indicates significantly higher citations vs other choices within that segment

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Key communication preferences (channel, frequency) by key information sources

Preferred Communication Channels & Scale

- Digital formats are preferred compared to others, with email, DPI website and Apps being the most popular channels. Emails being significantly more popular among *60-69 year-olds* vs other age groups, while the App and DPI website popular among *20-39 year-olds*.
- Those who did not identify as landholders are more likely to adopt digital channels such as DPI website, online data portal and virtual presentation.
- When it comes to scale or resolution of information, 3 in 4 respondents cited LGA is most useful, another 4 in 10 cited farm or state level.

Channels to access information

80% among **60-69 year-olds**

61% among **20-39 year-olds**

64% among **20-39 year-olds**

	Total	Landholders	Gov't or Private or Public Employees, Charity, Membership or Education Organisation
	n=253	n=163	n=90
		(A)	(B)
Email	58% ^	61%	54%
DPI website	48%	37%	68% **A**
App - mobile or tablet	37%	34%	42%
Online data portal	32%	24%	47% **A**
Face to face presentation	27%	25%	30%
Virtual presentation	21%	16%	30% **A**
Local rural radio	20%	21%	18%
Podcast	16%	13%	21%
Rural print media	16%	18%	12%
Text message to mobile	16%	14%	20%
Hard copy in mail	12%	18% **B**	0%
Not interested in accessing information from DPI	2%	3%	1%

Most useful scale or resolution of information

	Total	Landholder	Gov't or Private or Public Employees, Charity, Membership or Education Organisation
	n=253	n=163	n=90
		(A)	(B)
Local Government Area (LGA)	75% ^	75%	76%
Farm level	45%	51% **A**	33%
State-wide overview	43%	42%	44%
Parish	19%	16%	26%
Other	7%	5%	10%

A/B, Letters indicate significant difference at 95% level. For example, if you see data point with a letter next to it (say 30% A), this means that that datapoint is a significantly higher than it's associated datapoint in column A, at the 95% level.

^ indicates significantly higher citations vs other choices

qualtrics XM + Department of Primary Industries
Department of Regional NSW

NSW GOVERNMENT

Seasonal Conditions Reporting, Monitoring and Forecasting Report

For more information contact:
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NSW Department of Primary Industries | Agriculture
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