Table 2. Indicator thresholds that signal different stages of drought risk. These thresholds have been decided upon based on use in past studies, as well as past data trends in PNG (Rahmati et al., 2020; Nasrollahi et al., 2018; Aitkenhead et al., 2021).

Indicator	**No to Mild Drought Risk**	**Moderate Drought Risk**	**Severe to Extreme Drought Risk**
SPI	0.1 to 2	0 to -0.9	-1 to -2
VHI	>45	40 to 44	0 to 39
Percentage of Children Weighed at Clinics Less than 80% Weight for Age 0 to 4 years old	0 to 22	23 to 39	>40
Agricultural Occupation	0 to 24	25 to 50	>50
Key crop average replacement cost	0 to 1500	1501 to 3000	>3000
Staple crop tolerance scores	0	1	2
Land use (score)	0> to 2	>2 to 4	>4 to 6
Average Elevation (type)	1	2	3
Population density	>50	49 to 15	<15
Access to safe drinking water (%)	>60	60 to 40	<40

Table 3. The correspondence between risk level pattern observed across PNG in the risk assessment for each drought event identified, and the corresponding strength level assigned to the event.

Risk level pattern observed across PNG for indicated event	**Corresponding strength assigned to the event**
An approximately even number of provinces expressing moderate/severe risk level, with slightly more displaying severe.	Mild drought event.
Almost all provinces are at a severe risk level.	Moderate drought event.
Almost all provinces are at least at a severe risk level, with many expressing extreme risk levels.	Severe to extreme drought event.

Table 4. Information on the types of impacts associated with the three severity classes used to classify drought severity in the literature. Adapted from Allen & Bourke (1997).

Severity Class	**Types of impacts associated**
Mild	Unusually dry, but no major food supply, or drinking water or health problems OR some inconvenience with shortages in staple food but other food available, and/or must travel further to collect drinking water. Health satisfactory.

Moderate	Conditions are difficult, with food reduced and some famine food being eaten, and/or water available only at a distance, and/or some babies and elderly people unwell. No lives at risk and no related deaths reported.
Severe to Extreme	No food in gardens, famine food only being eaten, and/or water in short supply and possibly polluted, and/or increasing disease, and/or the lives of small children and elderly people at risk OR Extreme situation with only famine food available, and/or water very short, and/or many people ill, and/or small children and elderly people seriously at risk and/or related deaths reported.

Table 5. Drought hazard indicators that were investigated and found to be fit for use when measuring drought hazard in PNG provinces.

Indicator	Past use description	Listed by WMO?	Reason for Selection
SPI	Used in a similar drought assessment conducted in Iran [12]. It has also been used in various other past drought vulnerability assessments [13, 14]. Has been evaluated and proven to be effective by (Chua et al., 2020) through a case study investigating how well SWCEM precipitation products characterised drought in PNG during the 2015/2016 El Niño event.	Yes- Green.	SPI is a space-based monitoring drought hazard indicator. It can inform on whether an El Niño or La Niña event is occurring; low precipitation is most often associated with an El Niño phase in many PNG provinces, vice versa. It has been given 'green light' by World Meteorological Organisation (WMO) and recommended as starting point for drought hazard assessment [1]. It has also been proven reliable as a drought hazard indicator in a previous drought detection study in PNG (Chua et al., 2020) and used consistently in past drought risk assessments conducted in other countries with a drought-prone climate like PNG (Khan et al., 2008; Rahmati et al., 2014) For example, it was used in the study by Nasrollahi et al. (2018) to detect drought hazard in Iran. Iran has a hot, dry climate characterized by long, hot, dry summers and short, cool winters [12]. The climate has some similarities to PNG and therefore hazard indicators are likely to be climatically suited to this study. Although the study in Iran was very broad and used nonspecific indicators that were averaged across a large range of areas being assessed, SPI has been similarly used to indicate drought hazard in additional studies and proven to be useful when assessing drought on both broad and specific scales [13, 14]. Quality data for SPI is available from Space-Based Monitoring Observations available through National Oceanic Atmospheric Administration (NOAA) and Japan Aerospace Exploration Agency (JAXA).
VHI	Used in a study of agricultural drought in Zimbabwe [15]. Has been evaluated and proven to be highly effective by (Chua et al., 2020) through a case study investigating how well SWCEM precipitation products characterised drought in PNG during the 2015/2016 El Niño event.	Yes- Green	VHI is a spaced-based monitoring drought hazard indicator that can inform on whether an El Niño or La Niña event is occurring. Chua et al. (2020) determined VHI to be highly effective in indicating the spatial and temporal aspects of the severe 2015/16 El Niño event in PNG. It has been given the 'green light' by World Meteorological Organisation (WMO) due to its ease of use and reliability [1]. Furthermore, it has been proven useful through consistent inclusion in past drought risk assessments conducted in other countries with a drought-prone climate like PNG (Bhardwaj et al., 2021a; Dalezios et al., 2014). For example, in the Zimbabwe study conducted by Frischen et al. (2020) VHI was included as a drought hazard indicator. Although the climate of Zimbabwe is dissimilar to that of PNG, the study in Zimbabwe focused on agricultural drought risk and investigated this on specific, local community levels [15]. Therefore, the indicators used by Frischen et al. (2020) would be advantageous for use in this research, due to the importance of agriculture in PNG provinces and the subsequent focus on assessing agricultural risk in local communities with a risk assessment. However, the weighting of VHI will be reduced as it is primarily an indicator for agricultural drought risk, and although the agricultural impact of drought is of key focus in this research, a more holistic investigation is intended with additional focus on other sectors. Quality data for VHI is available through NOAA and JAXA.

Table 6. Additional drought hazard indicators investigated and found to be unfit for use when measuring drought hazard in PNG provinces.

Indicator	Past use description	Listed by WMO?	Reason for Omission
Rainfall Deficiency	Rainfall deficiency is a major factor responsible for occurrence of drought as it is the cause of subsequent soil moisture shortage for crops [2].	No	This indicator is too broad and has questionable accuracy at the provincial level [1]. There are more efficient indicators that similarly measure water availability that would be preferable.
Soil Moisture Deficit Index	Has been used to indicate salinity levels [16]. This is important as salinity levels affect agricultural production [16].	Yes- Red	This indicator is marked with a red light by WMO because of significant obstacles that threaten the ability for use of this indicator in research. This indicator requires weekly calculations at different soil depths, which is complicated to collect and calculate (Svoboda and Fuchs, 2016).
Standardised Water Level Index	It has been used in past studies to evaluate the hazard level of drought through the identification of the amount of salt in the water, hence by its salinity concentration [9].	Yes- Yellow	This indicator is marked as yellow due to some challenges when using this indicator for research. This indicator produces similar results to SPI, but it uses groundwater or well-level data instead of precipitation, which is more complex to collect and calculate (Svoboda and Fuchs, 2016).
Normalized Difference Vegetation Index (NDVI)	NDVI is used to identify and monitor droughts that are affecting agriculture specifically [1]. It is a remote sensing indicator that has openly available data from spaced-based monitoring organisations like NOAA [1].	Yes- Green	This indicator is a popular drought hazard indicator, but it has several limitations reducing the accuracy and efficiency for use in indicating drought. Past studies have shown that anomalies are common in temporal NDVI data (Gaikwad et al. 2015). Additionally, NDVI is known to be influenced by other atmospheric and environmental factors that are not related to drought. This threatens the accuracy of NDVI for indicating drought hazard conditions as NDVI values may reflect non-drought-related stress conditions in vegetation (Jiménez-Donaire et al. 2020).

Table 7. Drought vulnerability indicators that were investigated and found to be fit for use when measuring drought vulnerability in the PNG Provinces.

Indicator	Past use description	Reason for Selection
Percentage of Children Weighed at Clinics Less than 80% Weight for Age 0 to 4 years old	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Hirvonen et al., 2020; Cooper et al., 2019).	This vulnerability is an indicator specific for the health sector. It has been used in reliable past studies investigating and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Hirvonen et al., 2020; Cooper et al., 2019). For example, the study by Hirvonen et al. (2020) used this indicator in a case study of the 2015 drought event in Ethiopia to determine the association between drought risk and health impacts. Results of the study indicated that chronic undernutrition rates increased in drought-exposed areas that had a limited road network. The socio-economic characteristics, including those of the health sector, of Ethiopia are like PNG as they are both developing nations. Both Ethiopia and PNG have malnutrition as a main health concern, as well as lack of access to clean water and sanitation. Given the similarities between Ethiopia and PNG, and the past usefulness of this indicator in the study by Hirvonen et al. (2020), it is likely that this indicator will be an efficient drought vulnerability indicator for PNG provinces. Data is available at the provincial level in PNG for recent years from PNG National Weather Service (NWS) and United Nations Development Programme (UNDP).
Key crop replacement cost	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Mohmmed et al., 2018; Abid et al., 2016).	This vulnerability indicator is an indicator specific for the economic sector, considering socioeconomic drought affects. It has been used in reliable past studies investigating and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Mohmmed et al., 2018; Abid et al., 2016). For example, a drought vulnerability assessment conducted by Mohmmed et al. (2018) in five agricultural-based regions of Gadaref, Eastern Sudan used key crop replacement as an indicator to examine the susceptibility of farmers. The assessment resulted in the identification of the most vulnerable regions in the study area. Sudan has similar socioeconomic characteristics to PNG, as they are both least developing countries according to the United Nations General Assembly. Like PNG, Sudan has a population vulnerable to poverty and malnourishment, with most of the population depending on agriculture for their livelihood. Due to the similarity between Sudan and PNG regarding socio-economic factors, and the usefulness of this indicator in the past study by Mohmmed et al. (2018), key crop replacement cost is likely an effective indicator of drought vulnerability in PNG provinces. Data is available on the provincial level for recent years from PNG National Weather Service (NWS) and United Nations Development Programme (UNDP).
Staple Crop Tolerance Scores	Used in reliable past studies investigating and assessing climate vulnerability and the effects of drought within study areas with similar socioeconomic characteristics as PNG (Antwi et al., 2015; Ayantunde et al., 2015).	This vulnerability indicator is specific for the environment and agricultural sector, considering agricultural drought effects. It has been used in reliable past studies investigating and assessing climate vulnerability and the effects of drought within study areas with similar socioeconomic characteristics as PNG (Antwi et al., 2015; Ayantunde et al., 2015). For example, in the study by Ayantunde et al. (2015) staple crop tolerance score was used as an indicator in a drought vulnerability assessment of three agro-pastoral communities in Niger. Niger is a least developed country with similar socio-economic characteristics to PNG, with a like reliance on the agricultural industry. As in PNG, farmers in Niger are frequently impacts by disaster events like drought, reporting detrimental impacts to crops. Due to the related socio-economic characteristics of PNG and Niger, and the usefulness of staple crop tolerance score for indicating drought vulnerability in the study by Ayantunde et al. (2015), this indicator is likely effective for assessing drought vulnerability in PNG provinces. Data is available for recent years from PNG National Weather Service (NWS) and United Nations Development Programme (UNDP) Data is available on the provincial level in PNG.
Agricultural Occupation (% of population employed in agriculture)	Used in reliable past studies investigating drought vulnerability and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Nasrollahi et al., 2018; Mainali and Pricope, 2019).	This vulnerability indicator is specific for the economic and agricultural sector. It has been used in reliable past studies investigating drought vulnerability and assessing the effects of drought within study areas with similar socioeconomic characteristics as PNG (Nasrollahi et al., 2018; Mainali and Pricope, 2019). For example, the study by Mainali and Pricope (2019) in Nepal used agricultural occupation as an indicator for mapping climate vulnerability of ten drought-prone villages. Results displayed that most of the study area falls in the high vulnerability category with significant spatial variation. Nepal and PNG have a similar reliance on the agricultural industry, with a significant amount of the populations employed in agriculture. The similarity between PNG and Nepal regarding the reliance on agriculture, as well as the usefulness of this indicator in the past study by Mainali and Pricope (2019) means that this indicator is most likely effective for indicating drought vulnerability in PNG provinces. Data is available for recent years from PNG National Statistical Office. Data is available on the provincial level in PNG.

Table 8. Additional drought vulnerability indicators unfit for use when measuring drought vulnerability in PNG provinces.

Indicator	Past use description	Reason for Omission
Social dependency (% population >15 and <64 years old)	Used by Frischen et al. (2020) as a drought vulnerability indicator in a drought risk assessment in Zimbabwe. Like PNG, Zimbabwe is severely affected by drought leading to adverse impacts like water shortages, declining yields, and periods of food insecurity, accompanied by economic downturns. Both countries heavily rely on the agricultural sector. The risk index gave differing risk severity levels for the different regions of Zimbabwe (Frischen et al. 2020).	Although this indicator has been used in past studies in areas with similar characteristics to PNG, it is unlikely this would be a representative indicator of drought vulnerability in PNG provinces. This is because there is unlikely to be spatial variation in indicator data, thus would not indicate the varying vulnerability levels of PNG provinces. PNG has a similarly young population across all provinces.
Average household consumption of staple food	This food consumption indicator informs on food security in households (Ibok et al. 2019). In a study conducted by Islam et al. (2022) in Bangladesh, this indicator was used to indicate climate risk of vulnerable households.	Data is severely scarce for this indicator in PNG. Therefore, it cannot readily be used as an indicator for drought vulnerability in PNG provinces.
Average Household Income	Average household income has been investigated as an indicator of drought vulnerability in previous studies, including in the research conducted by Stenekes et al. (2012). In this study, Stenekes et al. (2012) revise indicators of drought vulnerability across the Murray-Darling Basin in Australia and propose indicators to be included in future risk assessments. Average household income is proposed as a vulnerability indicator.	As a least developed country, PNG is expected to have low average household income across most provinces. The likely similarity of data for this indicator across PNG provinces reduces the value for informing on the varying vulnerability levels in PNG.
Education (Literacy rate in at least one language % of population over 10 years old)	Education level (literacy rate) has been used in past risk assessment studies as an indicator for drought vulnerability, particularly for the adaptive capacity element. In an investigation of drought risk in Nigeria, focusing on food security impacts, Ibok et al. (2019) use education level as a drought vulnerability indicator. Although Nigeria is a more developed country compared to PNG, both countries have low literacy rates compared to western countries like Australia. This has the potential to affects the ability of locals to independently implement effective drought management strategies. A study of global drought risk by Carrão et al. (2016) use education level as an indicator to derive drought vulnerability. Using the drought vulnerability, hazard and exposure indices, a drought risk index was mapped across the globe and regions of high risk were identified.	Education levels are similarly low across all PNG provinces, including the National Capital District. According to a new survey conducted in five provinces of PNG from 2006-2011, by the Asia South Pacific Association for Basic and Adult Education (ASPBAE), education level is alarmingly low across all PNG provinces (less than 5% in some cases). As there would be little variation between provinces for this indicator, it would not be valuable for informing on the varying drought vulnerability levels in PNG.
Key crop production	In an investigation of drought vulnerability in India, crop production was proposed as a useful indicator (Saha et al. 2012). Similarly, crop production was used as an indicator in a drought vulnerability assessment conducted in Indonesia, which specifically focused on food security impacts (Dewan Ketahanan Pangan, Kementerian Pertanian and World Food Programme 2015).	The use in past studies investigating countries with a similar reliance on agriculture as PNG, means this indicator has the potential for use in the PNG risk assessment. However, in this research key crop production is seen more of an impact factor rather than a vulnerability factor. Staple crop tolerance or crop replacement cost a could be more specific indicators for indicating vulnerability to the effects of drought. For example, if a province was to have low crop tolerance scores and high replacement cost, it is likely that in a drought period the production of crops would be reduced as an impact of drought.

Table 9. Drought exposure indicators that were investigated and found to be fit for use when measuring drought exposure in PNG provinces.

Indicator	Past use description	Reason for Selection
Land Use (type)	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Rahmati et al., 2020; Shahid and Behrawan, 2008).	This is an exposure indicator specifically considering the environment and agricultural sector. It has been used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Rahmati et al., 2020; Shahid and Behrawan, 2008). For example, Land Use was used as an indicator in by Shahid and Behrawan (2008) as an exposure indicator included in the vulnerability index in a spatial risk assessment for drought in Bangladesh. In the Bangladesh study exposure was not considered as its own component of drought risk, it was included as part of the vulnerability component. Although the methodology of Shahid and Behrawan (2008) differs to the one used in this study, the consideration of land use as an exposure indicator is deemed appropriate for assessing risk in PNG. Like PNG, Bangladesh heavily relies on agriculture, with a large portion of land use dedicated to agricultural activities which have been affected by drought in the past. Data is available for recent years from PNG National Weather Service (NWS) and United Nations Development Programme (UNDP).
Elevation (type) (Highland/Lowland/Average)	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Han et al., 2015; Sun et al., 2020).	Elevation is an exposure indicator specifically considering the environment and Agricultural Sector. Elevation affects the severity of drought in PNG, with highland areas known to be most exposed to the effects of drought in PNG in the form of frost. In the 2015/2016 drought event in PNG, high altitude areas experienced severely detrimental impacts on crops (Iese et al. 2021). Elevation has been used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Han et al., 2015; Sun et al., 2020). Data is available from open-sourced GIS platforms.
Population Density	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Nasrollahi et al., 2018; Pei et al., 2018).	Population Density is an exposure indicator for social sector, as it is an indirect indicator for infrastructure, health service, and water accessibility. It has been used in reliable past studies investigating and assessing the effects of drought (Nasrollahi et al., 2018; Pei et al., 2018). More direct indicators of accessibility like access to roads or access to markets would be better for use here, however, data availability for such indicators is extremely limited. Thus, population density is seen as the best possible indicator for accessibility to contribute to the exposure index in this research. Data is available for population density in recent years from PNG National Statistical Office.
Access to safe drinking water (% of population with access to safe drinking water)	Used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Limones et al., 2020; Frischen et al., 2020b).	Access to safe drinking water is an indicator of drought exposure, particularly considering hydrological drought and its impacts on the social sector. If communities have limited access to safe drinking water, they will be more exposed to detrimental drought effects as they may have to travel further to additional water sources in times of drought, etc (Limones et al., 2020). It has been used in reliable past studies investigating and assessing the effects of drought within study areas with similar socio-geographic characteristics as PNG (Limones et al., 2020; Frischen et al., 2020b). For example, when investigating an approach for identifying high drought risk areas in data-scarce regions of southern Angola, Limones et al. (2020) use access to safe drinking water as an indicator of drought exposure. Angola is expected to have similarly restricted access to safe drinking water in some areas, just as with regions in PNG, as it is a Least Developed Country with locals having limited access to core resources. In the study by Limones et al. (2020) this indicator was able to help in the identification of high-risk areas to drought in Angola. The similarity between Angola and PNG mean it is likely that this indicator is suitable for use in informing a drought exposure index in PNG as well. Data is available for this indicator for recent years from PNG National Statistical Office.

Table 10. Additional drought exposure indicator unsuitable for use when measuring drought exposure in PNG provinces.

Indicator	Past use description	Reason for Omission
Access to roads	This indicator has been used in several past studies conducting risk assessments (Hagenlocher et al. 2020; Luh et al. 2015; Nakamura et al. 2019). For example, Nakamura et al. (2019) used this as an indicator for exposure in a drought risk assessment in Ethiopia. Results suggested that remote communities with roads connecting them to markets and other services had less exposure to drought impacts.	This indicator would be useful for indicating drought exposure; however, data is not available/accessible on the provincial level for PNG. Thus, this indicator cannot be included in the risk assessment at this time for PNG. In the future if data becomes available, then this indicator should be considered for the drought exposure index.
Access to land resources	This indicator was used in a study by Ghimire et al. (2010) which describes access to land resources as total landholding in a given area. It is explained that the higher the landholding, the lower the exposure to drought impacts. This is because landholding can serve as a cushion to absorb financial shocks by utilising it as collateral for loans or sale when needed.	This indicator is not appropriate for use in PNG, due to the nature of customary clan ownership, which over 95% of land in PNG remains under (Chand 2017). Customary clan ownership is defined as the long-established practices of PNG people. Clans rather than individual people hold most of the land in PNG provinces. Additionally, data for clan land holdings is scarce as the principles of land tenure that arise from custom are not commonly written down (Chand 2017).
Access to technology	Ghimire et al. (2010) use this indicator in an assessment of drought risk, explaining that this indicator is evidence for the adoption of improved varieties of crops or horticultural plants. Thus, access to technology likely reduces exposure.	This indicator is likely not representative of varied drought exposure among PNG provinces as it would be expected that access to technology would be relatively low across PNG. Additionally, data for this indicator is limited on the provincial level in PNG.
Access to social networks	Ghimire et al. (2010) use this indicator in an assessment of drought risk, defining this indicator as membership in social, political, or economic organisation. It is seen that access to social networks decreases drought exposure (Ghimire et al. 2010).	Data is restricted for this indicator on the provincial level in PNG. If data was restricted, it is believed that this would not be as ideal as an exposure indicator in PNG as if more relevant indicators were available like access to markets.
Access to market	Previous drought risk investigations have used access to market as an exposure indicator (Ghimire et al. 2010; Mdungela et al. 2017). It is defined as the walking distance to reach the nearest public transportation service or walking distance to the market itself. The lesser the distance, the more access to a market, which in turn means lower exposure. Walking distance is preferred over distance in kilometres, because of difference in topography in different areas of investigation.	Data is restricted for this indicator on the provincial level in PNG. It would be useful to incorporate this indicator in the risk assessment in the future if data becomes available.
On-farm diversification	Mdungela et al. (2017) used this as an indicator of drought exposure in an investigation of drought risk. On-farm diversification includes the mixing of crops and the inclusion of drought-resistance crops on farms. Mdungela et al. (2017) explain that the more diverse a farm is, the less exposed it is to drought conditions.	Data is restricted for this indicator on the provincial level in PNG. Currently, it is expected that information regarding farming types is included in the land use indicator. However, this indicator would be more specific for use if data was available.
Aridity Index	The Aridity Index has been used in past drought risk assessment studies like Lindoso et al. (2014). It is a real-time indicator in which water balance is considered with the comparison of the actual aridity to the normal aridity for a given period [1].	Not applicable to long-term or multi-seasonal events [1]. Thus it would not be appropriate to measure long-term drought; long term drought affects PNG frequently.

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Table 16. Average Sensitivity Index Values across PNG provinces for each indicator and the index which they inform using 2015 data as a case study. Rankings are shown for SI with highest sensitivity ranked first and lowest sensitivity ranked last. The likely credibility is also ranked amongst indicators, with first being the most credible for inclusion in the index and last being the least credible.

Index	Indicator	Sensitivity Index (Avg. across provinces)	Sensitivity Rank (highest to lowest SI)	Likely Credibility Rank
Hazard	SPI	0.56	1st	2nd
	VHI	0.47	2nd	1st
Vulnerability	Staple Crop Tolerance Score	0.41	1st	4th
	Agricultural Occupation	0.36	2nd	3rd
	Percentage of Children Weighed at Clinics Less than 80% Weight for Age 0 to 4 years old	0.33	3rd	2nd
	Key Crop Replacement Cost	0.31	4th	1st
Exposure	Land Use	0.39	1st	4th
	Elevation Type	0.34	2nd	3rd
	Population Density	0.32	3rd	2nd
	Access to Safe Drinking Water	0.31	4th	1st

6.1 Appendix A

Table displaying F-test results for the 2015-2016 drought period risk assessment versus literature results.

Statistic	df (degrees of freedom)	F statistic	P-value
Value	18	0.86	0.37

6.2 Appendix B

Table displaying F-test results for the 2019-2020 drought period risk assessment versus literature results.

Statistic	df (degrees of freedom)	F statistic	P-value
Value	17	0.71	0.25

6.3 Appendix C

Table displaying t-test results for the 2015-2016 drought period risk assessment versus literature results.

Statistic	df (degrees of freedom)	t statistic	P-value
Value	36	-1.70	0.10

6.4 Appendix D

Table displaying t-test results for the 2019-2020 drought period risk assessment versus literature results.

Statistic	df (degrees of freedom)	t statistic	P-value
Value	34	1.51	0.14

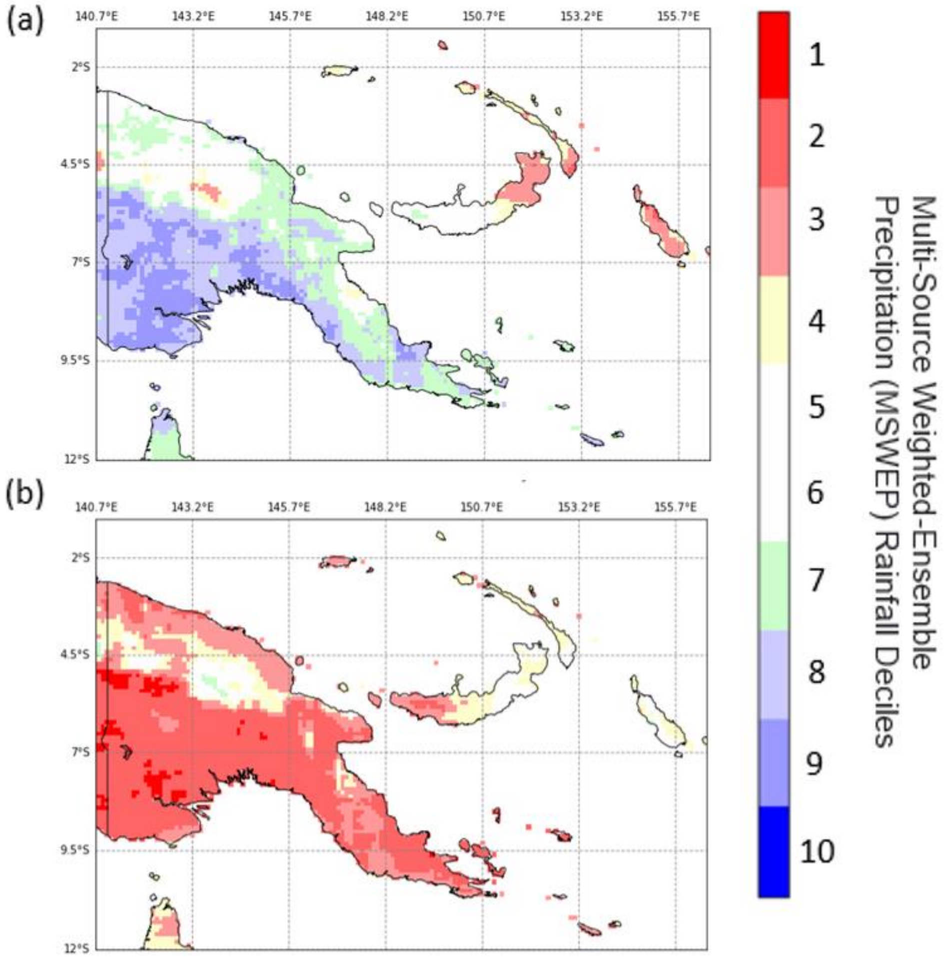

Figure 1: Multi-Source Weighted-Ensemble Precipitation (MSWEP) rainfall deciles in (a) La Niña events (La Niña years being 1988, 1989, 1995, 1998, 1999, 2000, 2007, 2010, 2011 and 2020) and (b) El Niño events (El Niño years being 1982, 1987, 1991, 1992, 1994, 1997, 2002, 2006, and 2015) compared to a base period of 1980–2020. Figure adapted from Bhardwaj et al. 2021b.

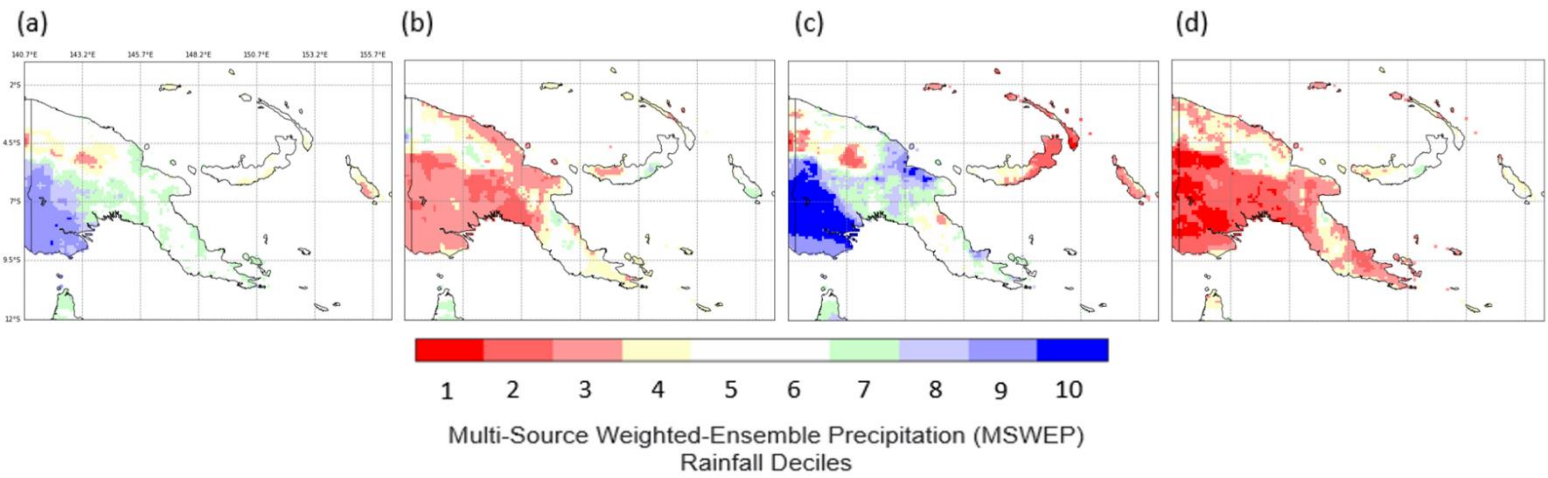

Figure 2. Multi-Source Weighted-Ensemble Precipitation (MSWEP) rainfall deciles in response to various climate drivers: (a) Negative IOD phase (during 1981, 1989, 1992, 1996, 1998, 2010, 2014, and 2016 years), (b) Positive IOD phase (during 1982, 1983, 1994, 1997, 2006, 2012, 2015, and 2019 years), (c) Negative IOD phase and La Niña ENSO phase (during 1989, 1998, and 2010 years) and (d) Positive

IOD phase and El Niño ENSO phase (during 1982, 1994, 1997, 2006, and 2015 years). Deciles are compared to a 1980–2020 base period. Figure adapted from Bhardwaj et al. 2021b.