

# Geography subject report

2022 cohort

February 2023



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# Introduction

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Throughout 2022, schools and the QCAA worked together to further consolidate the new Queensland Certificate of Education (QCE) system. The familiar challenges of flood disruption and pandemic restrictions were managed, and the system continued to mature regardless.

We have now accumulated three years of assessment information, and our growing experience of the new system is helping us to deliver more authentic learning experiences for students. An independent evaluation will commence in 2023 so that we can better understand how well the system is achieving its goals and, as required, make strategic improvements. The subject reports are a good example of what is available for the evaluators to use in their research.

This report analyses the summative assessment cycle for the past year — from endorsing internal assessment instruments to confirming internal assessment marks, and marking external assessment. It also gives readers information about:

- how schools have applied syllabus objectives in the design and marking of internal assessments
- how syllabus objectives have been applied in the marking of external assessments
- patterns of student achievement.

The report promotes continuous improvement by:

- identifying effective practices in the design and marking of valid, accessible and reliable assessments
- recommending where and how to enhance the design and marking of valid, accessible and reliable assessment instruments
- providing examples, including those that demonstrate best practice.

Schools are encouraged to reflect on the effective practices identified for each assessment, consider the recommendations to strengthen assessment design and explore the authentic student work samples provided.

## Audience and use

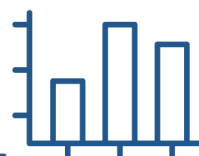
This report should be read by school leaders, subject leaders and teachers to:

- inform teaching and learning and assessment preparation
- assist in assessment design practice
- assist in making assessment decisions
- help prepare students for external assessment.

The report is publicly available to promote transparency and accountability. Students, parents, community members and other education stakeholders can use it to learn about the assessment practices and outcomes for General subjects (including alternative sequences (AS) and Senior External Examination (SEE) subjects, where relevant) and General (Extension) subjects.

## Report preparation

The report includes analyses of data and other information from endorsement, confirmation and external assessment processes. It also includes advice from the chief confirmer, chief endorser and chief marker, developed in consultation with and support from QCAA subject matter experts.



## Subject completion

The following data includes students who completed the General subject or AS.

**Note:** All data is correct as at 31 January 2023. Where percentages are provided, these are rounded to two decimal places and, therefore, may not add up to 100%.

Number of schools that offered the subject: 199.

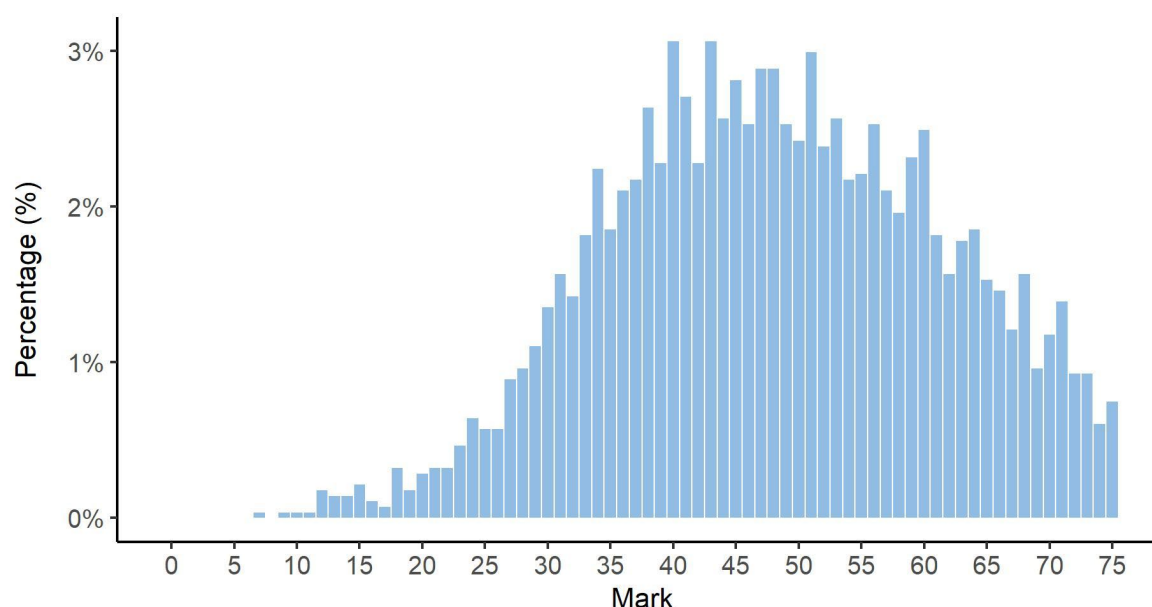
Completion of units	Unit 1	Unit 2	Units 3 and 4
Number of students completed	3175	3083	2776

## Units 1 and 2 results

Number of students	Satisfactory	Unsatisfactory
Unit 1	2869	306
Unit 2	2858	225

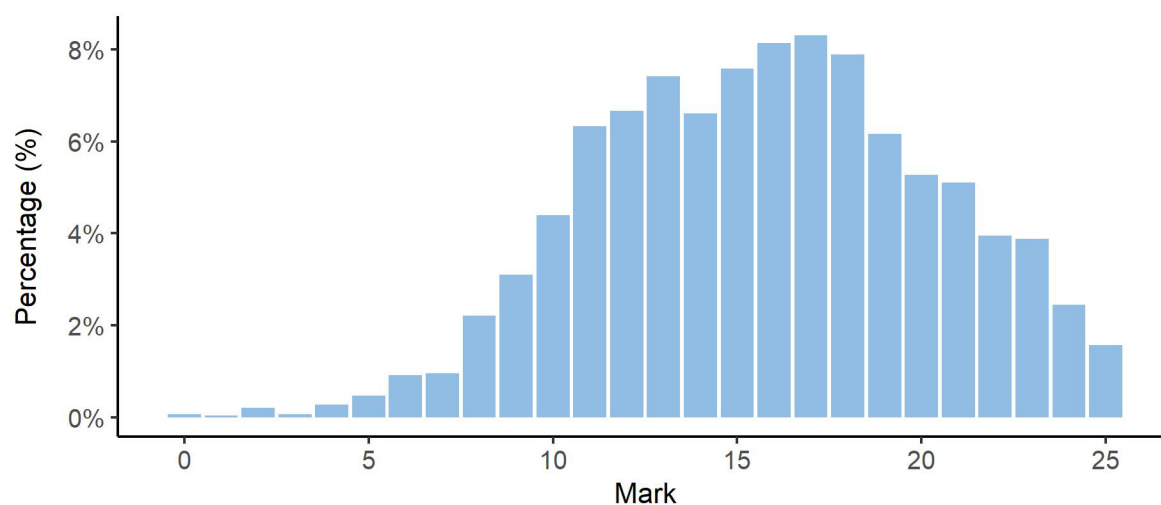
## Units 3 and 4 internal assessment (IA) results

### Total marks for IA

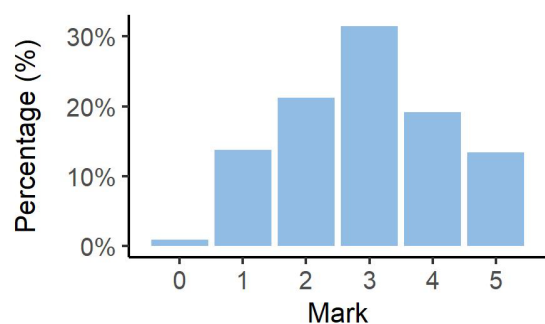


## IA1 marks

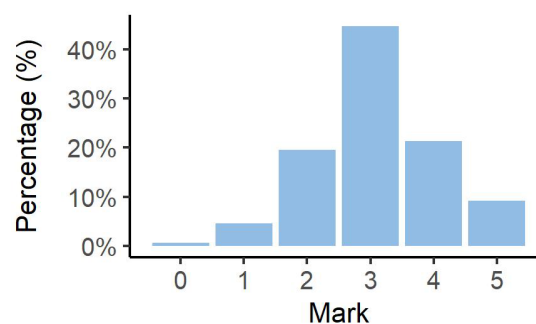
### IA1 total



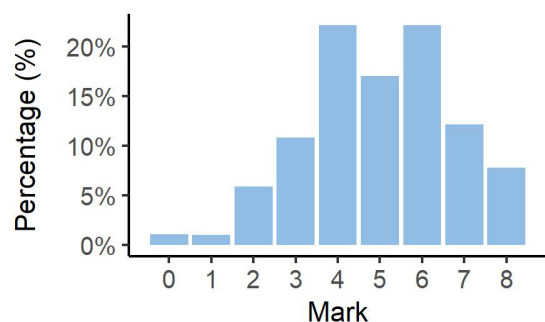
### IA1 Criterion: Explaining



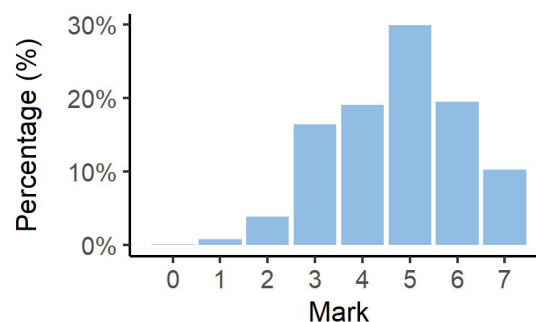
### IA1 Criterion: Comprehending



### IA1 Criterion: Analysing and Applying

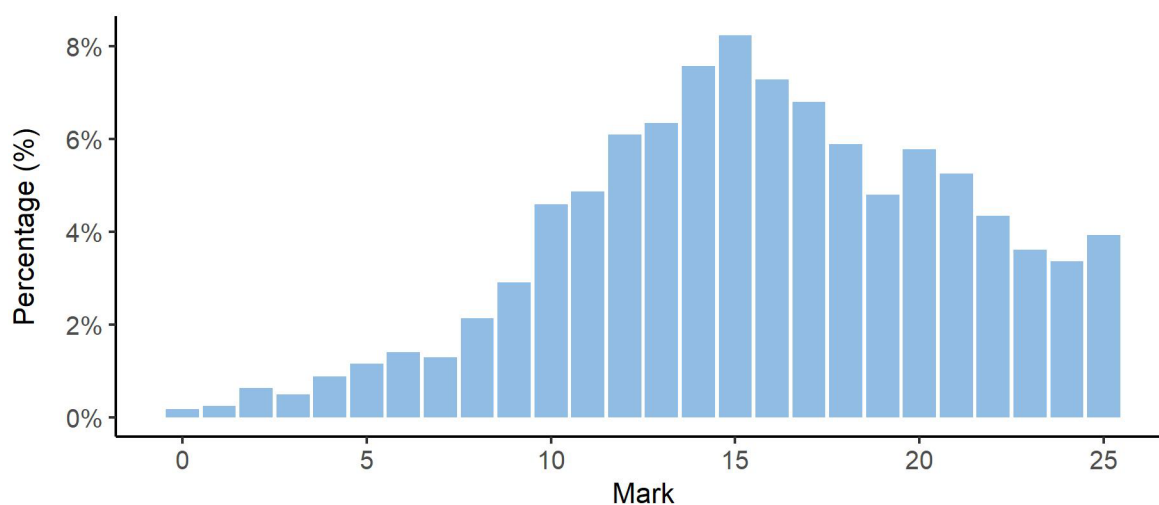


### IA1 Criterion: Communicating

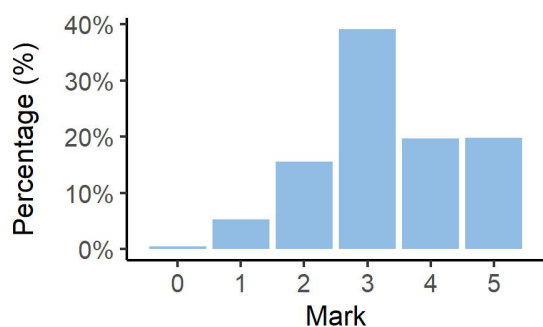


## IA2 marks

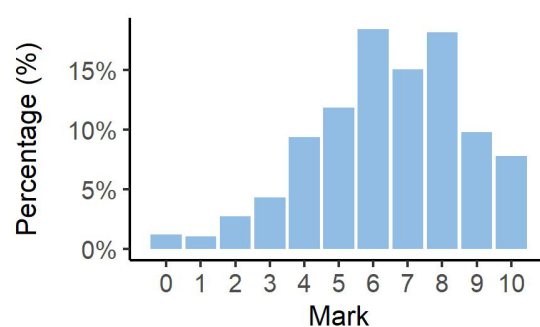
### IA2 total



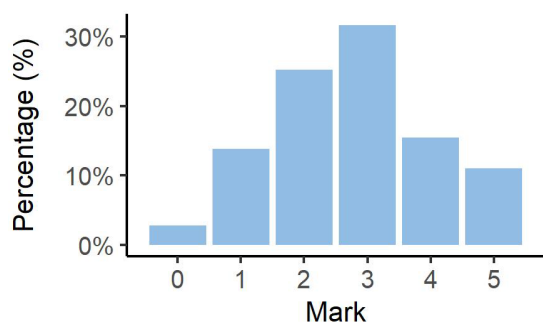
### IA2 Criterion: Explaining and Comprehending



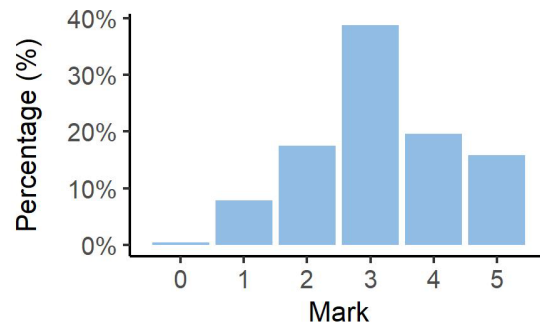
### IA2 Criterion: Analysing and Applying



### IA2 Criterion: Synthesising

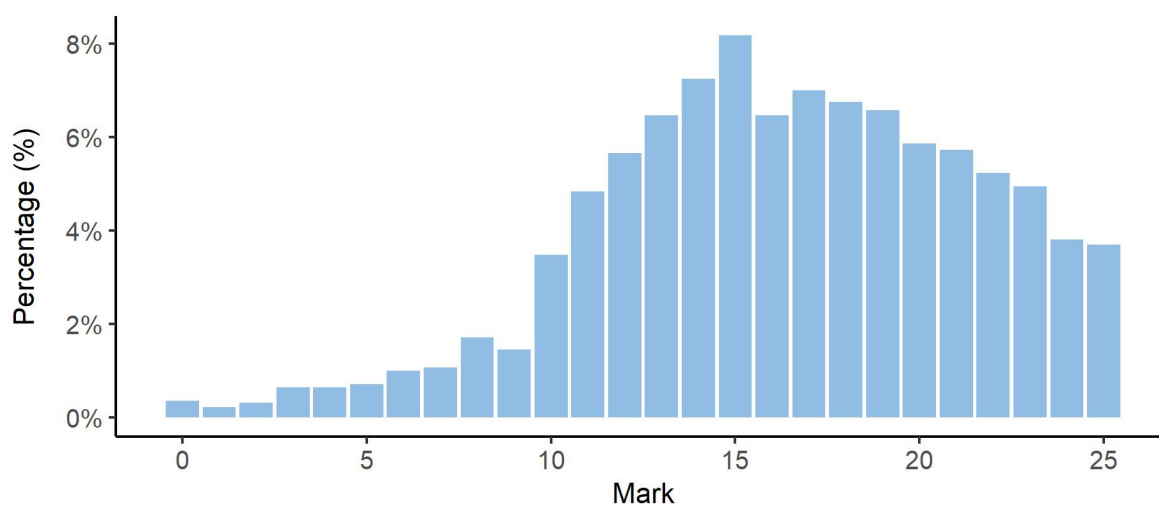


### IA2 Criterion: Communicating

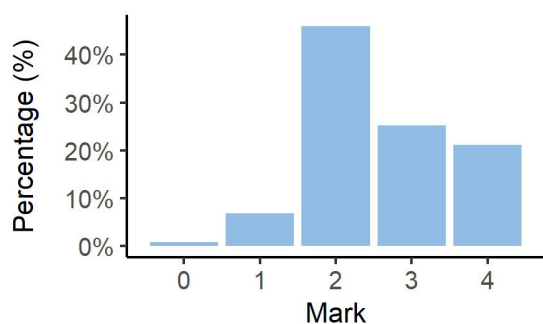


## IA3 marks

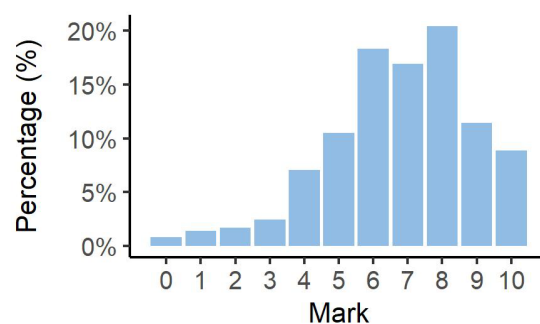
### IA3 total



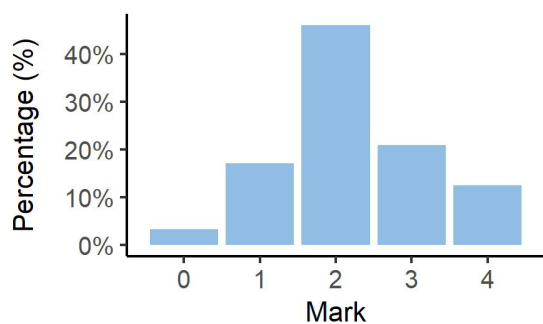
### IA3 Criterion: Explaining and Comprehending



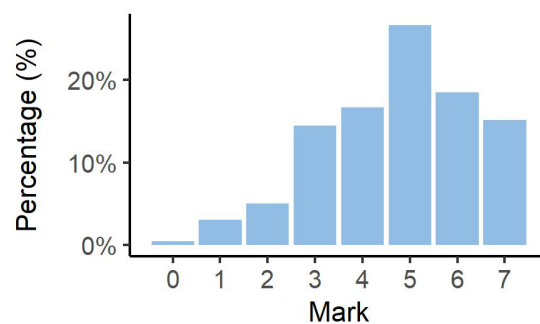
### IA3 Criterion: Analysing and Applying



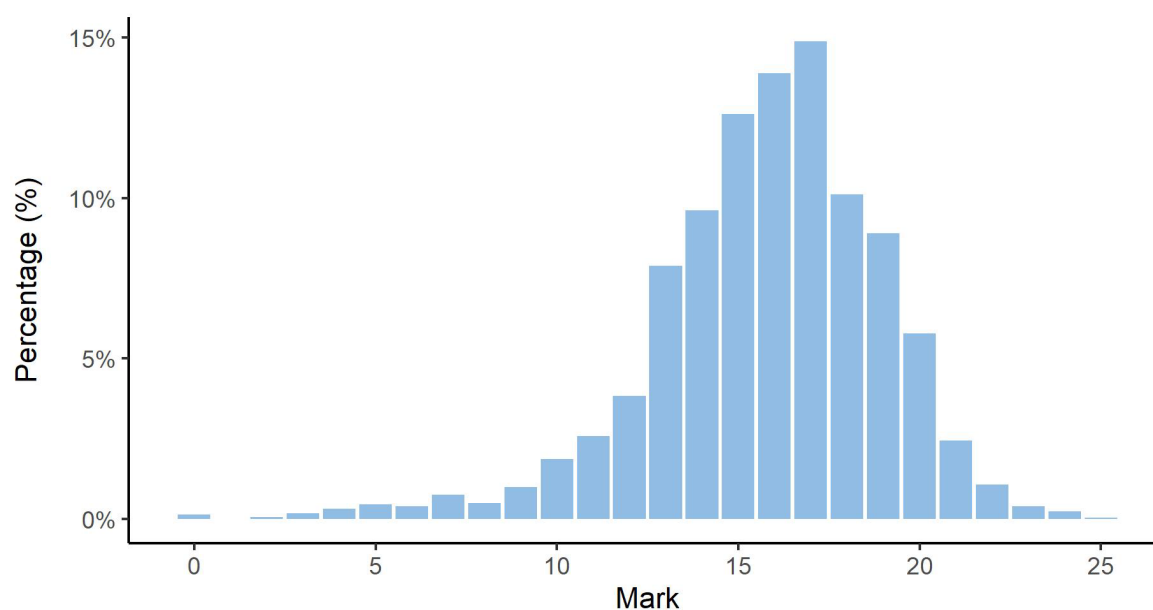
### IA3 Criterion: Synthesising



### IA3 Criterion: Communicating

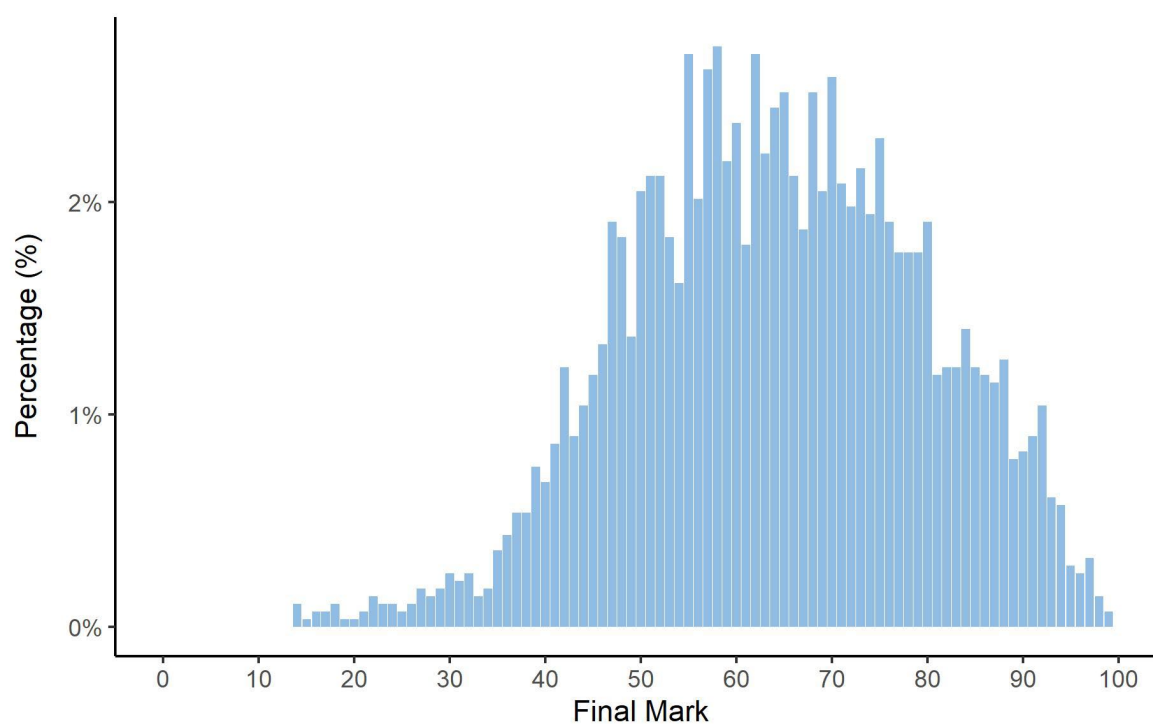


## External assessment (EA) marks



## Final subject results

### Final marks for IA and EA



## Grade boundaries

The grade boundaries are determined using a process to compare results on a numeric scale to the reporting standards.

Standard	A	B	C	D	E
Marks achieved	100–81	80–64	63–43	42–16	15–0

## Distribution of standards

The number of students who achieved each standard across the state is as follows.

Standard	A	B	C	D	E
Number of students	436	990	1127	219	4

# Internal assessment



The following information and advice relate to the assessment design and assessment decisions for each IA in Units 3 and 4. These instruments have undergone quality assurance processes informed by the attributes of quality assessment (validity, accessibility and reliability).

## Endorsement

Endorsement is the quality assurance process based on the attributes of validity and accessibility. These attributes are categorised further as priorities for assessment, and each priority can be further broken down into assessment practices.

Data presented in the Assessment design section identifies the reasons why IA instruments were not endorsed at Application 1, by the priority for assessments. An IA may have been identified more than once for a priority for assessment, e.g. it may have demonstrated a misalignment to both the subject matter and the assessment objective/s.

Refer to *QCE and QCIA policy and procedures handbook v4.0*, Section 9.5.

### Percentage of instruments endorsed in Application 1

Number of instruments submitted	IA1	IA2	IA3
Total number of instruments	199	199	198
Percentage endorsed in Application 1	7%	59%	52%

## Confirmation

Confirmation is the quality assurance process based on the attribute of reliability. The QCAA uses provisional criterion marks determined by teachers to identify the samples of student responses that schools are required to submit for confirmation.

Confirmation samples are representative of the school's decisions about the quality of student work in relation to the instrument-specific marking guide (ISMG), and are used to make decisions about the cohort's results.

Refer to *QCE and QCIA policy and procedures handbook v4.0*, Section 9.6.

The following table includes the percentage agreement between the provisional marks and confirmed marks by assessment instrument. The Assessment decisions section of this report for each assessment instrument identifies the agreement trends between provisional and confirmed marks by criterion.

### Number of samples reviewed and percentage agreement

IA	Number of schools	Number of samples requested	Number of additional samples requested	Percentage agreement with provisional marks
1	195	1248	259	61.54%
2	195	1184	201	62.56%
3	195	1225	223	61.03%



## Examination — combination response (25%)

The examination assesses the application of a range of cognitions to multiple provided items. Items are both short response and extended response using evidence from data. Data consists of a collection of information presented as tables and graphs, maps, diagrams and images with minimal text.

Student responses must be completed individually, under supervised conditions, and in a set timeframe.

## Assessment design

### Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

### Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	132
Authentication	0
Authenticity	19
Item construction	66
Scope and scale	92

\*Each priority might contain up to four assessment practices.

Total number of submissions: 198.

### Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- provided students more than one opportunity to demonstrate the assessment objectives
- provided a suitable dataset for the data transformation questions, considering the use of information and communication technologies (ICTs) and spatial technologies when administering the examination
- incorporated explicit language of the assessment objectives and/or performance-level descriptors in the examination questions, ensuring the assessable objectives were adequately assessed
- provided stimulus in Part B that was suited to analysis and included maps and data at a range of geographic scales.

## Practices to strengthen

It is recommended that assessment instruments:

- contain complex datasets that reflect the subject matter and can be transformed and represented in sophisticated cartographic and graphic forms
- ensure stimulus for Part B allows for multiple possible responses that assess the Analysing and Applying criterion. Patterns, trends and relationships must be evident in the stimulus to identify a geographical challenge, e.g. simple photographs as stimulus can be described but do not provide opportunity for analysis.
- use stimulus captions and references that do not influence a student's response. URLs are not required in a reference.

## Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

### Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	44
Language	34
Layout	51
Transparency	32

\*Each priority might contain up to four assessment practices.

Total number of submissions: 198.

## Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- included all information required to respond to the question on the same page in Part A
- used stimulus in both Part A and B which was legible and free from error, e.g. stimulus contained within borders for Part B were the most accessible
- had questions with a clear link to assessment objectives and were, therefore, the most transparent
- applied word limits to questions which met the task specifications.

## Practices to strengthen

It is recommended that assessment instruments:

- ensure stimulus for Part B adheres to the syllabus conditions and fits on one A3 page or equivalent
- provide stimulus that only includes data and information that is required to produce a response, without distractors, e.g. in Part A, only include data in tables that is required to complete the data transformation question.

## Additional advice

- Ensure that the amount of data students are presented with in order to make a map and/or graph is suitable. This is determined by the method of data transformation, e.g. 30 data points may be too many to be transformed within the syllabus conditions (time) where the map or graph is hand-drawn but may be suitable for transformation using relevant ICTs or spatial technologies.
- When constructing an examination from year to year, ensure there is a suitable level of difference to allow for authentic responses.
- Provide sufficient scope in the questions to ensure students are not producing the same or very similar responses when answering consecutive questions.
- Avoid using stimulus published in public forums as this may compromise the authenticity of the examination.

## Assessment decisions

### Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

#### Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Explaining	84.62%	11.79%	3.08%	0.51%
2	Comprehending	85.13%	13.33%	1.54%	0%
3	Analysing and Applying	75.38%	21.03%	1.54%	2.05%
4	Communicating	71.28%	24.1%	3.08%	1.54%

### Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

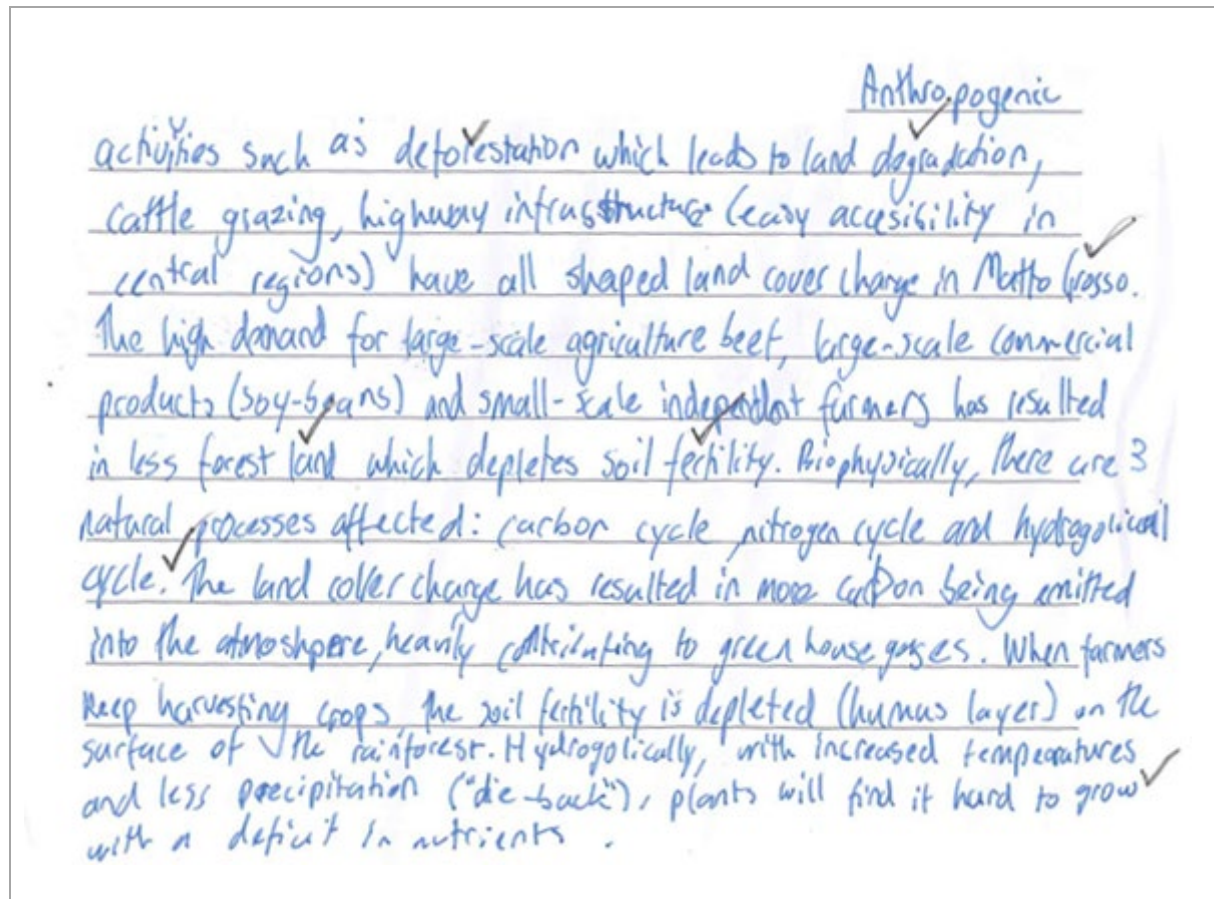
- for the Explaining criterion, responses matched to the upper performance level described a variety of features and elements of both biophysical and anthropogenic processes that shaped the identity of a place, and comprehensively explained how the interactions between the biophysical and anthropogenic processes caused land cover change resulting in a changing climate
- for the Comprehending criterion, responses matched to the upper performance level accurately recognised and described spatial patterns of land cover change and identified significant relationships in the data provided to determine possible implications of climate change for selected people and places

- for the Communicating criterion, responses matched to the upper performance-level descriptors for the data transformation questions demonstrated proficient transformation and representation of geographical data and information in sophisticated cartographic and graphic forms.

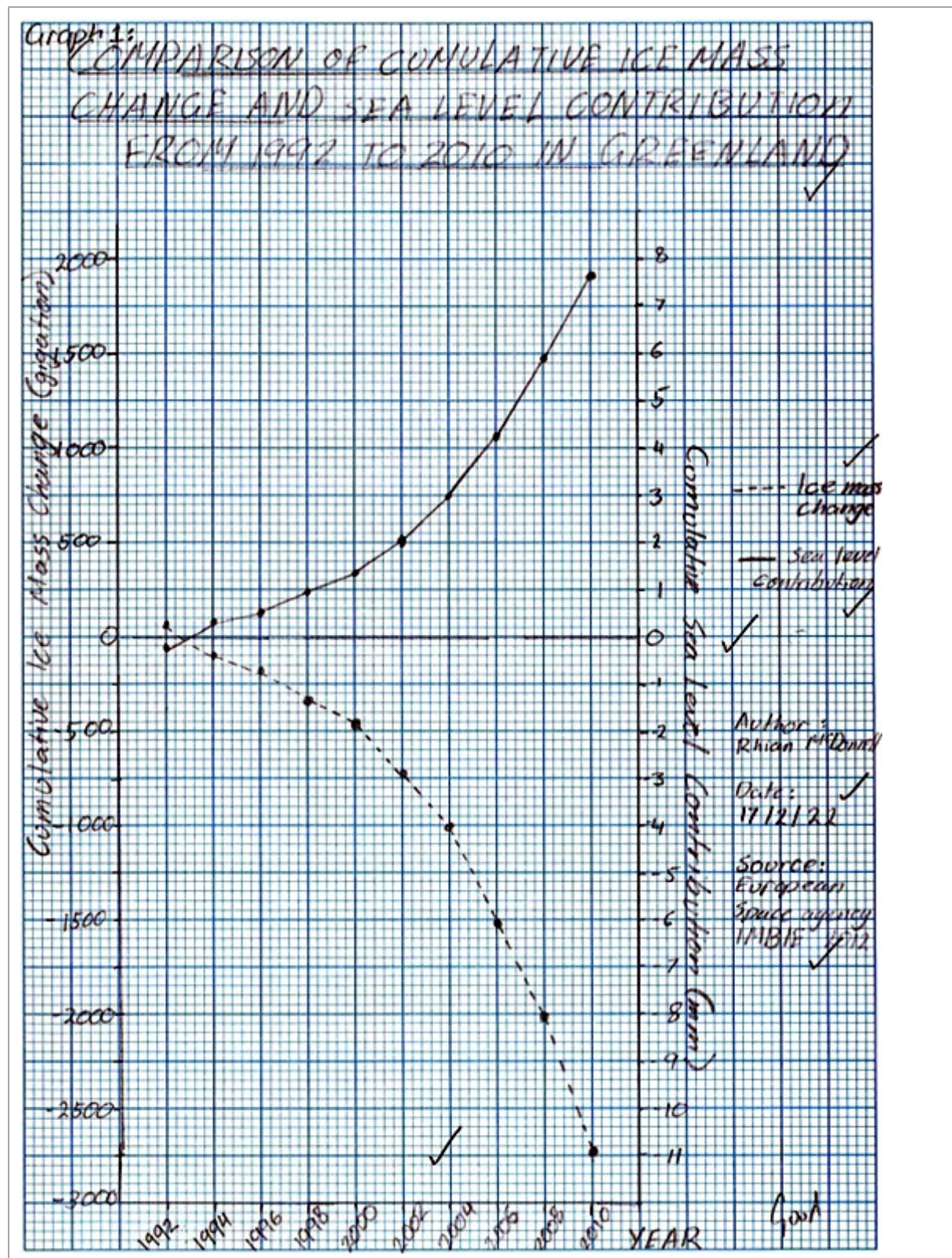
#### Samples of effective practices

The following excerpt demonstrates the upper performance level for the Explaining criterion. The explanation includes reference to a variety of features and elements of both biophysical and anthropogenic processes and the interactions that result in land cover change and a changing climate.

**Note:** The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.



The following excerpt demonstrates the upper performance level for Communicating. The transformation of data is proficient (adept and accurate) and the graph is sophisticated.



## Practices to strengthen

To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- for the Analysing and Applying criterion (Part B) at the upper performance levels
  - responses identify trends, patterns and relationships across a range of the data sources and information provided, rather than simply describing individual items of the stimulus
  - responses make generalisations (inferred from the analysis) about the potential impacts on both biophysical and anthropogenic environments based on the identified causes of the geographical challenge
- for the Communicating criterion at the upper performance level
  - cartographic and graphic forms represent multiple sets of data related to land cover and/or climate change
  - data is accurately transformed and represented with appropriate unit intervals.

## Additional advice

- Where appropriate, student-generated choropleth maps should reveal proficient transformation of the data to determine appropriate classes and use suitable light-to-dark shading with the highest value represented by the darkest shading.
- Spatial technologies and/or ICT may be used by students in the IA1 to represent data in cartographic and graphic forms, e.g. Geographic Information Systems (GIS), Excel.



## Investigation — field report (25%)

This assessment requires students to research a land-management or water-management challenge at a local scale through a field investigation. A field investigation assesses a range of cognitions in a particular context including observing, questioning, planning, collecting, recording, representing, analysing and responding to primary data and communicating geographical understanding in a field report.

The assessment occurs over a defined period of time. Students may use class time and their own time to develop a response.

## Assessment design

### Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

### Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	31
Authentication	1
Authenticity	18
Item construction	15
Scope and scale	37

\*Each priority might contain up to four assessment practices.

Total number of submissions: 199.

### Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- used specific sites in which there was an identified challenge that was clearly a land-management or water-management challenge associated with local land cover change
- provided the opportunity for substantial data collection that allowed for meeting the top performance-level descriptors for the analysing criterion
- provided authentic context and task statements and appropriate steps to complete the task which ensured students had a clear understanding of the task requirements.

## Practices to strengthen

It is recommended that assessment instruments:

- identify relevant challenge/s at the selected site that allows students to develop the field investigation
- ensure the fieldwork site is at an appropriate scale, and where there is adequate opportunity to observe and gather data to explain the identified challenge
- keep the context statement brief, ensuring it does not prevent students from identifying the causes of the challenge through their fieldwork investigation, or potential responses to the challenge
- make explicit reference to authentication strategies where data is collected in groups. Data must be independently analysed so students can create a unique response.

## Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

### Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	1
Language	6
Layout	1
Transparency	5

\*Each priority might contain up to four assessment practices.

Total number of submissions: 199.

## Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- included context and task statements that linked clearly to the topic and task requirements
- used appropriate geographical terminology in the context statement and task description.

## Practices to strengthen

It is recommended that assessment instruments:

- ensure context statements are concise and do not include information about how to complete the task, e.g. any information explaining what the students need to do must be included in the task section
- focus on challenges occurring as a result of local land cover change resulting in a land-management or water-management challenge for a specific site.

## Assessment decisions

### Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

#### Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Explaining and Comprehending	86.15%	13.85%	0%	0%
2	Analysing and Applying	72.31%	16.92%	1.54%	9.23%
3	Synthesising	78.46%	20%	0.51%	1.03%
4	Communicating	78.97%	20%	1.03%	0%

### Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

- for the Explaining and Comprehending criterion, responses matched to the upper performance level
  - provided in-depth explanations of how the local land cover change being investigated was the result of both biophysical and anthropogenic processes
  - accurately described spatial patterns of land cover change at the fieldwork location and represented the land cover change in student-generated maps that were incorporated into the field report
  - explained relationships between the biophysical and anthropogenic processes that resulted in the land cover change and identified significant implications of the change for selected people and places.
- for the Synthesising criterion, responses matched to the upper performance level clearly relied on the analysis to propose action/s to sustainably manage the impacts of the identified challenge at the field work location. Justification of the proposal was clearly linked to the impacts identified in the analysis.

#### Samples of effective practices

The following excerpts demonstrate in-depth explanations describing features and elements of biophysical and anthropogenic processes that have resulted in landcover change that is the cause of the identified water-management challenge at the fieldwork location.

The proposal demonstrates the synthesis of information from the analysis to propose justified action/s for sustainable management of land cover change that will address the water management challenge identified for the fieldwork location.

**Note:** The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.

### Excerpt 1

This report focuses on water management challenges impacting Avondale Creek at a disturbed location (16°50'45"S, 145°41'45"E), 1.22km from the undisturbed location (16°50'25"S, 145°41' 15"E), identified in Figure 1. Through a field investigation, it was observed that the main challenge is turbidity: a measure of light scattered by particulate matter suspended in water (Frayne, 2010).

Avondale Creek borders the Wake Park and is bisected by a major highway and bypass. It is surrounded by pockets of commercial and residential development to the north-west, and sugar cane farming to the east. This land use contributes to chemical runoff; coupled with stream bank erosion, this promotes eutrophication, exacerbating turbidity (Figure 1).

Turbidity prevents light penetration and encourages algal growth, resulting in decreased photosynthesis and dissolved oxygen (DO), impacting the health and sustainability of aquatic ecosystems and surrounding terrestrial areas. This in turn effects the Cattana Wetlands and greater ocean, with sediment plumes flowing out to the GBR, smothering corals and discouraging tourism. Turbidity also reduces the aesthetic and cultural value of the creek, which currently serves as an important recreational and spiritual site.

It is evident that anthropogenic processes have negatively impacted stream health at the disturbed site. Changes observed are driven by farming, urban and residential development (Figure 1).

In the week prior to data collection, the site experienced rainfall of 101.8mm (Australian Government Bureau of Meteorology, 2022). Heavy rainfall naturally introduces particles into waterways as flow velocity increases. Intensive rainfall and shallow rooted weeds allow for loose soil composition, promoting erosion and bank scouring. Poor soil stability from clearance of riparian vegetation, and invasive species, increases concentrations of loose sediment entering the waterway.

The lower creek borders the Wake Park, major highway, and residential areas; thus, surface runoff has seen an increase in particulate matter and chemical content. A high turbidity of 20 NTU metres indicates an unhealthy state, when compared to the acceptable baseline measure of 15 NTU metres (Queensland Government, 2009). This has broader implications for the biodiversity and sustainability of the ecosystem.

**Excerpt 2**

Remnants of riparian vegetation; bank scouring, and erosion have occurred as a result of its removal.

Loosely bound soil composition of the stream bank, with invasive weeds interspersed (evidence of anthropogenic interference).

Data analysis reveals that Avondale Creek is impacted by urban stream syndrome, with degraded, physical, chemical and biological conditions. Clearance of native riparian vegetation has resulted in high turbidity, directly impacting the sustainability and liveability of this ecosystem. This challenge has wider implications for the Cattana Wetlands and GBR.

Lilies should be removed to improve flow and subsequently, turbidity, with greater redistribution of sediments. Manual removal, whilst labour intensive, is more effective than herbicides, which introduce pollutants. To mitigate the effects of erosion, sedimentation and chemical discharge, native riparian vegetation could be restored via creation of a 'green corridor'. Green corridors are characterised by rich vegetation, connecting ecosystems amongst urban areas (Iberdrola, 2021). Several revegetation programs have been successfully implemented, like the Edward/Kooley Riverbank Project in New South Wales (New South Wales Government, 2020) (Figure 11).

Invasive weeds (Figures 4 and 7) should be replaced with Australian Natives, endemic to north Queensland, such as Bottle Brushes and Eucalypts, that bind soil and stabilise banks. Deep-rooted systems prevent undercutting and scour, slowing erosion and thus reducing turbidity (Queensland Government, 2017). Sedge grasses and mat rushes should replace the rocks along the bank (Figure 4), as their fibrous root systems are better equipped to combat erosion, capture sediments and nutrients (ANU Sustainable Farms, 2021). This slowed runoff will in turn prevent eutrophication.

Whilst this project will cost the local council, the long-term impact outweighs short term expenses. Controlling turbidity through revegetation will improve water quality, allowing for habitat restoration, ecosystem diversity, and resilience to a changing climate. Furthermore, gabions can be used in the interim to stabilise banks while plants grow to. Rehabilitation would improve economic and social sustainability, creating job prospects, as well as generating community engagement, with improved aesthetic appeal.

**Practices to strengthen**

To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- for the Analysing and Applying criterion at the upper performance level, students collect fieldwork data and information that allows for the identification of relationships and interactions that result in an identifiable geographical challenge at the fieldwork location. For the Applying criterion, generalisations about the impacts of the identified land cover change include both biophysical and anthropogenic environments

- for the Communicating criterion at the upper performance level, sophisticated cartographic and graphic forms represent multiple pieces of fieldwork data, e.g. multiple layers in a map.

### **Additional advice**

- Ensure that data gathered in the field reflects anthropogenic and biophysical factors that result in significant impacts for both people and places for the fieldwork location.
- Require students to recognise and describe comprehensive spatial patterns of land cover change/s for the fieldwork location.
- Ensure that the analysis of fieldwork data is focused on a single geographical challenge for the fieldwork location.
- Understand that the proposed action to manage the impacts of the identified challenge may include several strategies.
- Ensure that, where recordings of electronic reports are submitted for confirmation, the recording is done by the student to demonstrate the interactive data representations; voice overs are not required.



## Investigation — Data report (25%)

This assessment requires students to research a specific challenge or problem (at a local scale of study, for a place in Australia) through collecting, representing, analysing and responding to a range of data that is both teacher-provided and student researched. A geographic inquiry uses research practices to assess a range of cognitions in a particular context. Research practices include locating and using information beyond students' own knowledge and the data they have been given.

This assessment occurs over a defined period of time. Students may use class time and their own time to develop a response.

## Assessment design

### Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

### Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	28
Authentication	2
Authenticity	8
Item construction	30
Scope and scale	54

\*Each priority might contain up to four assessment practices.

Total number of submissions: 198.

### Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- presented one or more fundamental sets of raw data from the Australian Bureau of Statistics (ABS)
- ensured there was a discernible demographic challenge evident in the initial dataset, such as ageing population, youth population, population decline, or rapid population growth
- provided datasets for places at an appropriate geographical scale, such as ABS Statistical Area Level 2 (SA2).

## Practices to strengthen

It is recommended that assessment instruments:

- ensure the initial data set provided to students includes only raw data that has not already been analysed and summarised, or transformed and presented as graphs or maps
- consider scope and scale when selecting initial data sets. Places with a very low total population may not exhibit a suitable demographic challenge that allows for further investigation. A place that encompasses a very broad geographical scale (such as ABS SA4) may not allow students to propose authentic strategies to manage a challenge at a local scale
- do not require students to include an appendix.

## Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

### Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	1
Language	13
Layout	4
Transparency	3

\*Each priority might contain up to four assessment practices.

Total number of submissions: 198.

## Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- used clear and concise language and appropriate geographical terminology to describe the task and the context
- provided the initial datasets in table format.

## Practices to strengthen

It is recommended that assessment instruments:

- where multiple datasets are provided present these in a consistent format
- include only the raw data in tables of data from the ABS and not the summary statements that constitute analysis of the data.

## Assessment decisions

### Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

### Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Explaining and Comprehending	84.62%	14.87%	0.51%	0%
2	Analysing and applying	75.38%	14.87%	3.59%	6.15%
3	Synthesising	83.08%	16.41%	0.51%	0%
4	Communicating	79.49%	18.97%	1.03%	0.51%

### Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

- for the Analysing and Applying criterion, responses matched to the upper performance level
  - selected demographic data and information that allowed for interpretation and inferences that showed patterns, trends, and relationships to explain the main causes of the identified demographic challenge
  - demonstrated sophisticated extrapolation when generalisations were complex, i.e. beyond the immediate impacts of the identified demographic change, e.g. impacts that were secondary or even tertiary in nature
- for the Communicating criterion, responses matched to the upper performance level proficiently transformed raw data and accurately represented multiple datasets in graphic and cartographic forms with appropriate unit intervals.

### Samples of effective practices

The following excerpts demonstrate the Analysing and Applying and Communicating criteria at the upper performance level. For the Analysing and Applying criterion, the discerning selection of data and information allows for astute interpretations and inferences and sophisticated extrapolation to make generalisations about impacts for people and places.

For the Communicating criterion, the use of multiple layers of data and the proficient transformation into sophisticated cartographic and graphic forms demonstrates the upper performance level for the data transformation descriptors of the criterion, as well as the accomplished use of geographical terminology and the conventions of written communication.

**Note:** The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.

## Excerpt 1

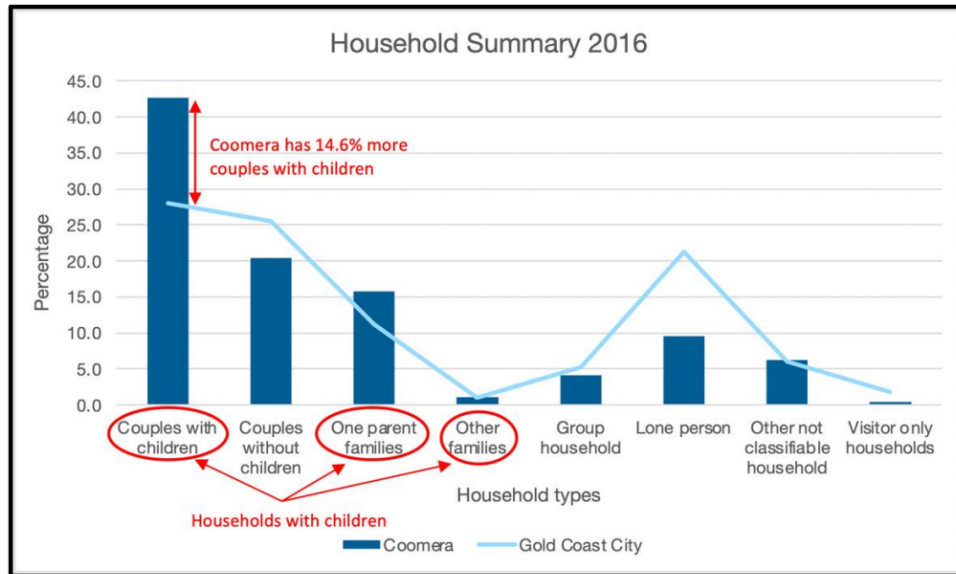


Figure 9: Household Summary 2016

Figure 9 displays the breakdown of family structure in Coomera compared to Gold Coast City. Couples with children is the most common household type in Coomera at 42.6%, which is 14.6% more than the Gold Coast. Overall, approximately 60% of households in Coomera contain children. This demonstrates Coomera's largely young population, as evident in Figure 2.

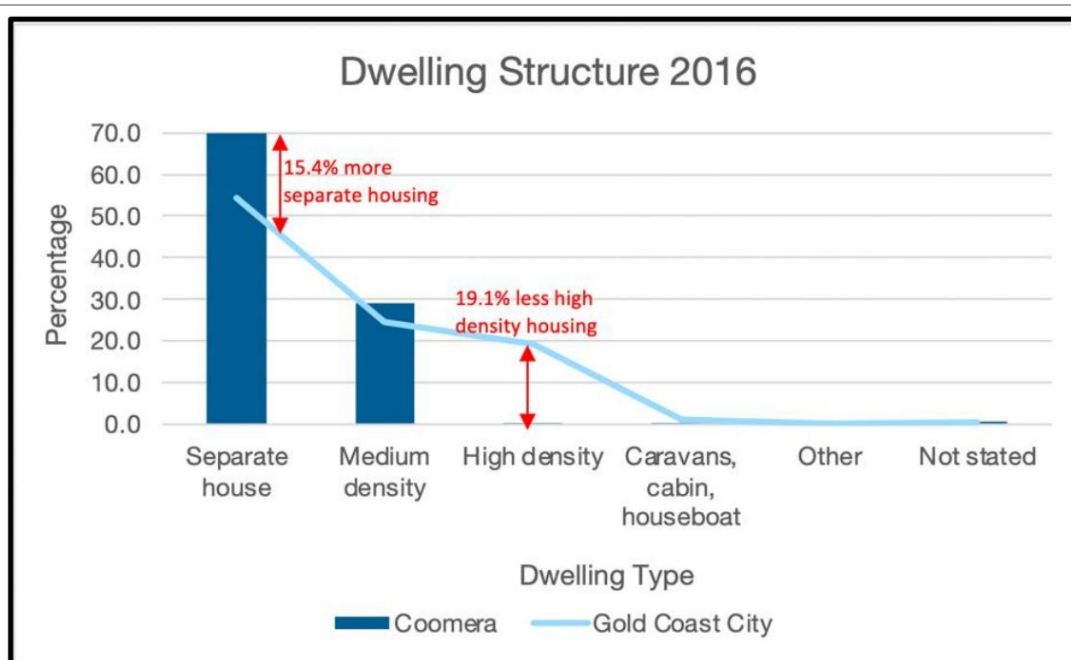


Figure 12: Dwelling Structure 2016

Figure 12 shows that approximately 70% of the housing in Coomera is separate housing, with practically no high-density housing, which corresponds with the urban sprawl evident in Figure 6. This presents a significant challenge for Coomera as housing demand continues to rise, yet due to the low-density housing, there is a lack of space for new estates.

Subsequently, the cost of rent and mortgage repayment are much higher than in surrounding areas. The median weekly rent for Coomera is \$418, which is 51% of their median weekly income of \$825, which places residents in housing stress. Additionally, the weekly mortgage repayment is \$526 which is 63% of the median income, suggesting severe housing stress for the 27% of the population paying mortgage.

## Excerpt 2

A major impact of Coomera's largest demographic being young families is urban sprawl. As these young families seek to purchase their first homes, a large amount of low-density housing has been constructed. This has numerous of biophysical and anthropogenic implications. Figure 17 shows a comparison of Coomera's population density in 2011 and 2021. It clearly demonstrates that the suburb has only minorly increased in density, which indicates urban sprawl. Whilst it has increased in density in the centre, some areas in the east and south have decreased, and overall, the trend in density has remained constant.

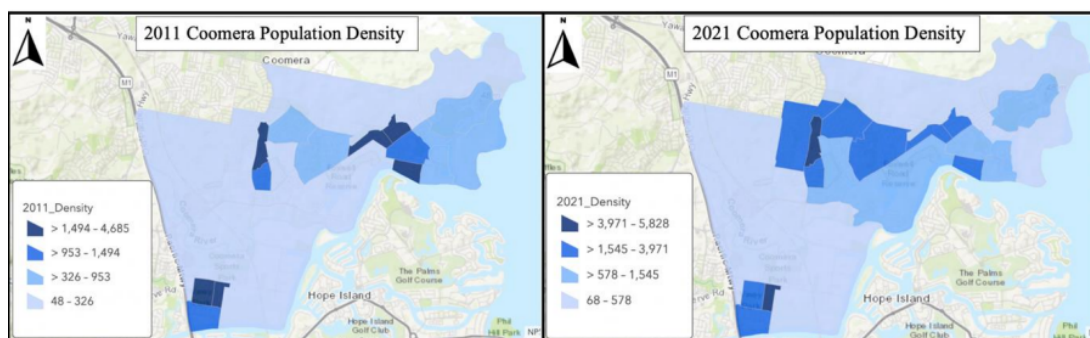


Figure 17: Density Over Time

One of the largest biophysical impacts of urban sprawl is deforestation. As discussed in 1.3, a large amount of deforestation occurred in order to build new estates, which subsequently, causes a loss of wildlife habitat, disturbing the local ecosystem (OECD, 2014). Another negative environmental impact is that there is a heavy reliance on cars, which causes air pollution (OECD, 2014). Both of these impacts result in increased carbon in the atmosphere, thus contributing to global warming (National Geographic, 2019). Figure 18 demonstrates Coomera's reliance on cars, and it can be seen that 89% of residents use cars, with only 6.1% using public transport.

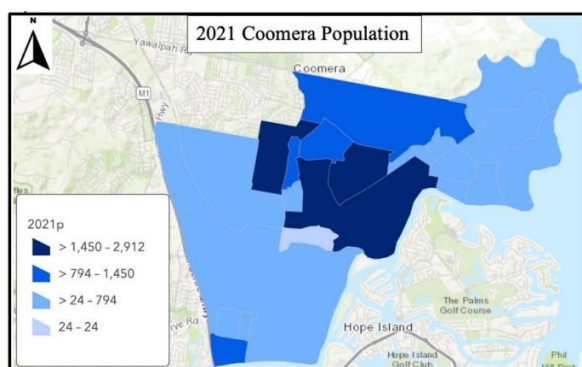


Figure 7: 2021 Coomera Population

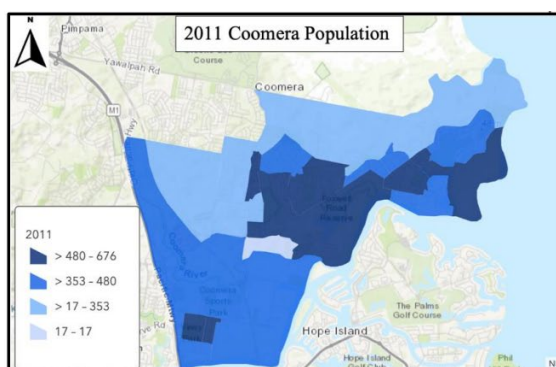


Figure 8: 2011 Coomera Population

## Practices to strengthen

To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- the initial data transformation allows for one clear demographic challenge to be identified and investigated, e.g. a single challenge arising from a youthful or ageing population in a place
- maps are student-generated using spatial technologies and/or ICT. Maps that are downloaded must be effectively adapted to the student's response, e.g. using overlays and annotations.

- the proposal/s to manage the impacts of demographic change uses the synthesis of information from the analysis and includes convincing evidence to demonstrate the upper performance level.

**Additional advice**

- Ensure that additional data gathered by the student for the IA3 investigation is at the same geographical scale as the fundamental set of raw data provided by the teacher, e.g. SA2.

# External assessment



External assessment (EA) is developed and marked by the QCAA. The external assessment for a subject is common to all schools and administered under the same conditions, at the same time, on the same day.

## Examination — combination response (25%)

### Assessment design

The assessment instrument was designed using the specifications, conditions and assessment objectives described in the summative external assessment section of the syllabus. The examination consisted of one paper (51 marks).

The examination assessed subject matter from Unit 4, Topic 2. Questions were derived from the context of Global population change.

The assessment required students to answer five short response questions (including creating a scatter graph) and one extended response question.

The stimulus consisted of a range of maps and graphs for both short response questions, and the extended response. Short response questions focused on internal and international migration, population density, and global fertility rates, and the extended response question focused on conflict as the cause of involuntary migration in the West Africa Sahel region.

The AS assessment instrument was the same as the external assessment for the General syllabus.

### Assessment decisions

Assessment decisions are made by markers by matching student responses to the external assessment marking guide (EAMG). The external assessment papers and the EAMG are published in the year after they are administered.

### Effective practices

Overall, students responded well to:

- analysing data and information to explain geographical challenges and applying their understanding from the analysis to make generalisations about the impact of the identified challenge for people or places
- analysing data and information in maps and graphs to answer short response questions
- selecting the appropriate form, a scatter graph, to show the relationship between the two sets of data provided.

## Samples of effective practices

### Short response

Question 1 required students to identify patterns of migration in selected European countries and describe the impacts of each pattern on the population of a relevant country, using evidence from the stimulus provided.

Effective student responses:

- identified two patterns of migration evident in the graph
- described the impact of each pattern on a relevant country's population
- used evidence from the graph.

This excerpt has been included:

- because it clearly identifies two patterns evident in the graph — one is places where emigration is greater than immigration, and one is places where immigration is greater than emigration
- as it describes the relevant impact on the population for the examples used.

Bosnia and Herzegovina has ~~a~~ an emigration pattern of people <sup>(25million)</sup> leaving the country and no immigration can be seen. However ~~a~~ it can be seen that the pattern of leaving the country makes up for 50% of the population with only 1% being immigrants. This impacts the country's population immensely as almost 50% of its population has left.\* Another pattern that can be seen is in Switzerland with 2.5million immigrants entering the country in 2019 and only 1million leaving. This is a very different pattern to Bosnia and Herzegovina which can be highlighted in 30% of <sup>Switzerland's population</sup> ~~the country~~ being immigrants.

Question 3 required students to analyse total fertility rates for global regions, shown in a map, and make an inference about a geographical challenge for countries with fertility rates below replacement value.

Effective student responses:

- provided a detailed analysis of the pattern evident in the map
- made astute inferences about a geographical challenge
- used evidence from the map.

This excerpt has been included:

- to illustrate a detailed analysis of the patterns of fertility, referring to specific places with above replacement value (Central and West African regions) and those below replacement value (Spain, Italy, Germany, North America, and Canada)
- to demonstrate astute inferences about a geographical challenge for countries with fertility rates below replacement value.

The global fertility replacement level is 2.1 children per women to keep the population steady or continue to grow. It can be seen on the graph, most regions in Europe, including Spain, Italy and Germany, are below fertility replacement levels at less than 1.55. This is also seen in North America, where both USA and Canada have a fertility rate of 1.55-1.99, below replacement. It is seen that more economically developed countries, have a lower, below replacement, fertility rate. However in Central and Western Africa, regions are above fertility replacement between 4.01 to greater than 5.05 children / women. It is seen the LDCs have fertility rates above 2.1. A challenge to regions, such as Europe and North America where fertility levels are below replacement (2.1), is there may be a negative natural increase occurring ~~the region~~ and without positive population momentum may see a decline in the population. These regions will have to rely on population momentum or emigration for the total population to remain stable and not decline.

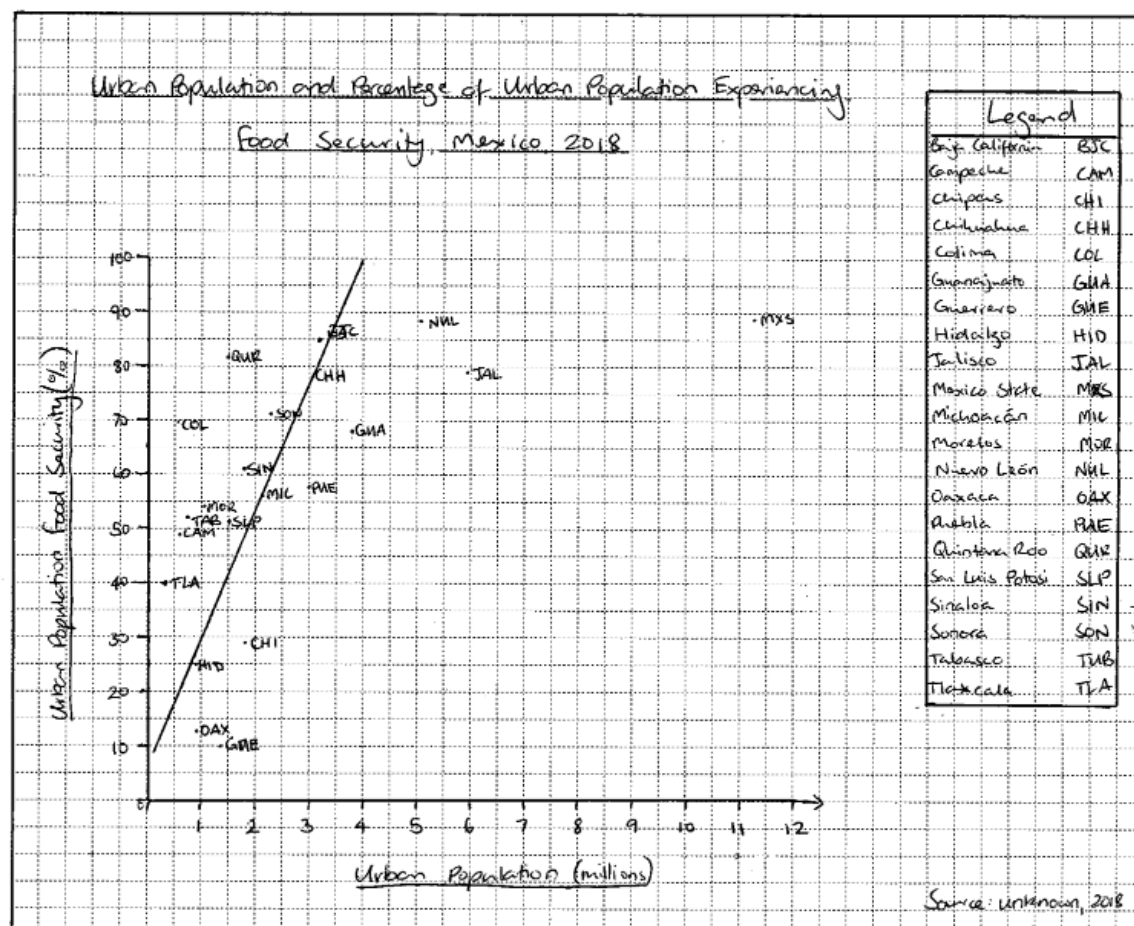
Question 5a and 5b required students to create a scatter graph showing the relationship between urban populations and food security in Mexico and then analyse the graph to make inferences about the impact of the relationship on internal migration.

Effective student responses:

- accurately plotted the data
- used an appropriate scale
- included the appropriate conventions for a scatter graph.

This excerpt has been included:

- to illustrate a high-level response for the Communicating criterion that correctly places the independent variable on the x-axis and the dependent variable on the y-axis, accurately plots the data, and identifies a positive relationship between the two sets of data.
- as it demonstrates a plausible inference about the impact of the relationship, i.e. internal migration will result in movement to places with higher food security, but in turn, will increase food insecurity for the places with less urban population.



The graph shows a positive, moderately strong relationship between urban population (millions) and urban food security(%), as shown by the line of best fit. As urban population increases, so does food security – as seen in Hidalgo (0.89, 25%) and Baja California (3.26, 85%). A possible outlier to this is Colima, which has a small population (0.542) but a large food security percentage (70%). From this, it can be inferred that internal migration will increase, as people will move to populations with higher food security, and will in turn increase the food security. However, this will decrease food security in smaller populated regions, further reinforcing the need to move to higher populations.

### Extended response

Question 6 required students to analyse a range of stimulus, presented as maps and graphs, to make inferences about a geographical challenge for the West Africa Sahel region and then use the analysis to make generalisations about the impacts of the identified challenge for people or places.

Effective student responses:

- provided a detailed explanation of a geographical challenge by interpreting the data and information to determine cause-and-effect relationships
- used comprehensive data to support the explanation
- identified complex relationships in the data
- made complex generalisations about the impacts on people or places
- used the analysis to support the generalisations
- organised paragraphs to convey ideas purposefully and fluently in relation to the question
- used correct geographical terminology throughout the response.

These excerpts have been included:

- to illustrate a response that makes clear links between the data analysed to explain the identified geographical challenge of the pressure on host countries of refugees, in addition to their own internally displaced persons, due to conflict (Excerpt 1)
- to demonstrate the use of appropriate data from multiple pieces of stimulus to support the explanation (all excerpts)

- to illustrate complex relationships in the data that underpin the explanation, such as the relationship between conflict events and the destination of refugees coinciding with the already stressed conditions experienced in host countries (low socioeconomic status, food stress, and conflict) (Excerpt 2)
- to illustrate the use of the analysis to make generalisations that are complex by explaining more than a primary implication (Excerpt 3).

### Excerpt 1

Consequently, this results in the significant challenge of ~~migration~~ <sup>internally</sup> the high numbers of refugees and internally displaced persons within these regions, thus placing pressure on the host countries to support them.

There is a correlation between conflict events and the proportion of internally displaced persons whereby regions with high numbers of conflict events have a large proportion of internally displaced persons.

This is particularly evident for Mali <sup>and Burkina Faso</sup> which have the highest number of conflict events (117,005,000 and 80,706,000 respectively), and over 80% internally displaced persons (218k and 848k respectively) (stimulus 1). Additionally, Nigeria had the largest number of conflicts in 2020 resulting in 1.8M <sup>(100%)</sup> internally displaced persons (stimulus 1). The conflict also results in the migration of individuals out of these zones into refugee camps, whereby ~~people are~~ <sup>people are</sup> travelling across international borders to from high conflict countries to neighbouring countries with less conflict, primarily Niger and Chad (stimulus 1). This leads to an increase in the population of these countries whereby people are clustered in makeshift settlements along borders. Consequently, this places pressure on these countries to accommodate the refugees.

## Excerpt 2

regions with low life expectancy's of 69 years for Niger and 62<sup>55</sup> years for Mali<sup>in 2019</sup>. In addition low gross national income per capita in 2019 of \$1,555 USD for Chad and \$1,201<sup>USD</sup> for Niger. indicating less economically developed region with limited resources available

In addition, these ~~to~~ regions of Chad and Niger have very poor agriculture resources of 43% of Majority of the regions agriculture in the northern halves as arid and nomadic pastoralism, therefore unable to be used for crops due to extreme desertification in the Sahel. Niger's main source of agriculture is ~~stop to~~ produced through rainfed agriculture at 43% of agriculture types, while 43% of agriculture is cropped. This and only 14% of agriculture is irrigated. This becomes a significant with the rain scarcity of rainfall in the West Africa Sahel as it has experienced periods of significant decline <sup>of mean yearly rainfall</sup> from 2cm/month in 1950s, down to negative 1.5cm/month in 1980s, then slowly rising ~~to~~ to 1cm/month in 2015, at an average yearly amount of 0.7cm/month in 2015. These rates of rainfall for the Sahel West Africa Sahel are extremely scarce and inadequate for the production of agriculture required in the regions, ~~leaving many~~ causing implications with food production for residents in the region. It is seen in stimulus 3 that many regions in West Africa Sahel experienced ~~extreme~~ food stress as a result of these significantly low rainfall patterns <sup>significantly</sup> ~~creating~~ significant ~~desertification~~ desertification in the Sahel. However, ~~that~~ these regions of main attraction for refugees ~~are~~ experience the most severe food stress at 1.1 million people in Chad and <sup>1.93</sup> 1.2 million people in Niger experiencing food stress. These locations of severe food stress are located <sup>at Mali and Niger and Niger and Niger</sup> around the borders of Chad and Niger, where migrants are seeking refuge.

**Excerpt 3**

The ~~lack of severe food crisis in Niger and Chad~~ along with lack of agriculture due to ~~insufficient~~ insufficient rainfall poses as a ~~severe~~ implication for both residents of the area as well as the refugees seeking shelter. With lack of nutritious food and inadequate health care as highlighted through the low life expectancy indicates severe issues relating to the health of refugees will arise. ~~to~~ This will result in severe starvation and malnutrition due to lack of food, ~~and lack of water~~ whilst the lack of rainfall severe drought causing people to resort to drinking contaminated water predominantly putting refugees <sup>and residents</sup> at risk of contracting water borne diseases, whilst the levels of malnutrition will ~~enhance~~ cause the refugees and residents of Chad and Niger more prone to illness and increase the severity of this implication on their health. Ultimately leaving refugees severely ill with no resources available to them due to lack of healthcare in Chad and Niger.

**Practices to strengthen**

It is recommended that when preparing students for external assessment, teachers consider:

- including activities to develop students' analytical skills so they can
  - identify cause-and-effect relationships evident in a stimulus, e.g. in Question 6, the number of conflict events over five years in multiple countries in the region and prolonged drought in the same countries resulted in the movement of refugees across neighbouring borders, placing stress on host countries
  - use comprehensive data (i.e. from multiple pieces of stimulus) to support their explanations of the identified challenge
- developing students' abilities to apply their understanding from their analysis to make complex generalisations about the impacts on people or places. Complex generalisations are more than a primary and obvious implication, e.g. a primary implication is that places experiencing conflict will see a reduced life expectancy and reduced farm labour leading to less agricultural production. A complex generalisation is that conflict typically reduces the availability of labour and can decimate agricultural land exacerbated by drought which would lead to a reduction in agricultural production. Reduced agricultural production reduces the availability of food, which creates food stress, resulting in hunger and malnutrition. It also contributes to increasing food prices and the need to import food, which creates food insecurity
- including activities that build students' understanding of the types of graphs and maps that are suited to different types of data, e.g. the best representations of two datasets that show a relationship is a scatter graph; data that represents change over time is best represented in a multiple line graph; percentage data is best represented in a sector graph and comparative data in multiple/compound columns or bar graphs.