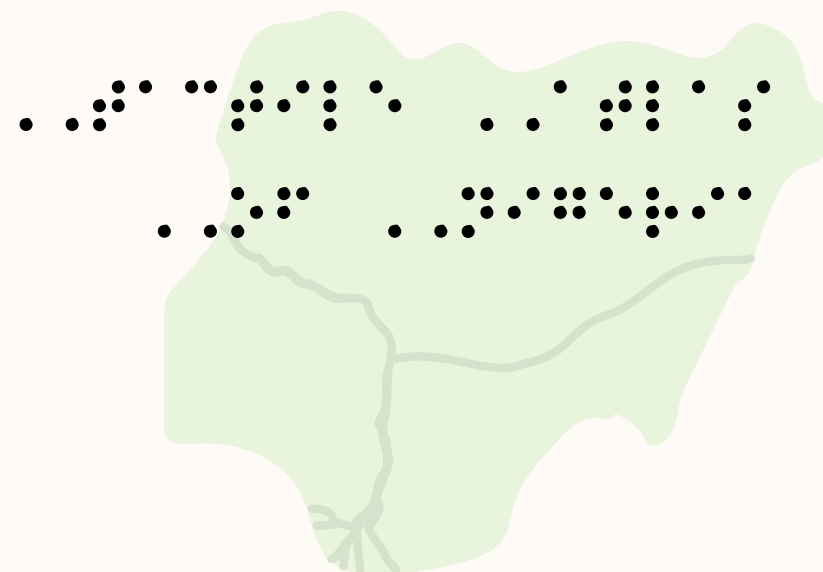




TACTILE ATLAS OF NIGERIA



Bamidele Clement Oke, 2026

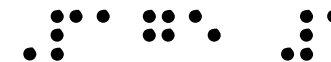


Co-funded by
the European Union



Palacký University
Olomouc





First Edition. July 31, 2026

Attachment No. 1 of the Master's Thesis submitted in partial fulfilment of the requirements for the degree of Master of Science (MSc).

at

Paris-Lodron University Salzburg (PLUS), Faculty of Digital and Analytical Sciences, Department of Geoinformatics, Salzburg, Austria.

and

Palacký University Olomouc (UPOL), Faculty of Science
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Data Sources:

Esri ArcGIS Living Atlas

OpenStreetMap Contributors

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Copernicus Climate Change Service (C3S)

National Bureau of Statistics Nigeria

Macmillan Nigeria Secondary School Atlas

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About This Atlas

This tactile atlas is a specialized educational initiative developed as a master's thesis to bridge a critical gap in inclusive geographic education. In Nigeria, students with visual impairments face profound learning challenges due to a severe shortage of adapted instructional materials, particularly in visually intensive subjects like geography. This project directly addresses this educational deficit by designing and producing tactile cartographic resources that provide equitable access to essential spatial information.

The primary objective of this atlas is to facilitate a meaningful transition from passive, lecture-based learning to active, hands-on spatial exploration. By interacting dynamically with physical and political maps, visually impaired students can form concrete mental concepts of complex geographical relationships. Beyond classroom success, developing these fundamental spatial skills supports the students' broader autonomy, geographic literacy, and independent mobility.

Developing the atlas required combining geographic information systems (GIS) with strict tactile cartographic generalization principles to ensure legibility. Every layout element including line weights, textures, map frames, scales, and braille labels was carefully optimized for touch based on established accessibility standards. The microcapsule paper printing method, commonly known as swell paper, was adopted as the production technique due to its excellent tactile clarity, production efficiency, and cost-effectiveness.

To ensure its real-world utility, the atlas underwent a rigorous two-phase user-testing process across two different countries. The first validation phase took place in Europe at the Grammar School and Secondary School for Students with Visual Impairments, Prague, where visually impaired students evaluated the initial tactile parameters. Valuable feedback from these participants regarding braille font sizes, line definitions, and texture separations was instrumental in refining the design of the map prototypes.

The second testing phase was conducted across selected special schools within Nigeria to evaluate the refined maps directly with prospective end users and educators. Engaging students in their local learning environments ensured that the tactile parameters met the practical needs of the classroom and aligned with user expectations. Insights gathered from these field tests coupled with reviews by thesis supervisors and a pedagogy expert guided the final round of structural improvements for the atlas, completely optimizing the resource for the national geography curriculum.

The final structure of the atlas presents a progressive learning journey that spans global, continental, and national scales. It begins with broad world maps and regional divisions across Africa to establish a macro-level geographic context for the reader. The core of the atlas then transitions into highly detailed national themes, mapping Nigeria's historical administration, geopolitical zones, population data, transit networks, seasonal climate trends, and international trade dynamics.



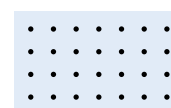
How To Use This Atlas

This atlas is systematically organized into eight thematic geographic sections to guide readers through a logical learning sequence. Each major section starts with an introductory overview page that previews the upcoming contents and main themes. The subsequent pages consist of detailed map pages and corresponding legend pages. Depending on the layout complexity and the space available, some sheets combine both the map and its legend into a single layout, ensuring that related information is always within immediate reach. An arrow is presented at the top left corner to provide orientation and every text on every page is provided in both visual and tactile formats, serving readers with varying degrees of vision.

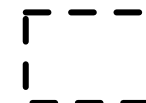
A consistent layout is maintained across all pages to ensure intuitive navigation and orientation. The title of a page is always positioned at the top-left corner, while the page number is located at the top-right corner. The specific audio track number is also placed at the bottom-right corner of each page when available, indicating which digital audio file accompanies and explains the content.

To keep the spatial presentations clear and easy to read, all geographic features are bound within thin, distinct map frames. The legend, which elaborates specific data focuses and defines the distinct tactile textures used on the map, is ideally positioned on the left side of the frame. In cases where map density requires more layout space, the legend is placed on its own dedicated page immediately following the map.

Waterbody is represented by a light blue colour and little dots throughout the atlas and the boundaries of landmasses surrounding the focused areas are represented by dashed lines as shown below since entities do not exist in isolation.



Waterbody



**Boundary of
other landmasses**

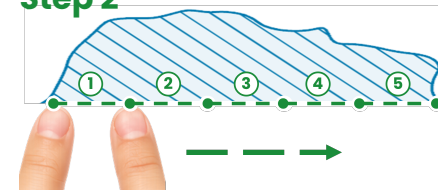
Reading and interpreting distances on a tactile map is a skill that requires active practice and hands-on familiarity. The scale for each map is presented directly below the title as a horizontal line and statement scale.

As illustrated below, estimating real-world distances can be accomplished using two fingers. To do this, place two fingers directly onto the graphic scale bar to measure and lock in the physical length of the indicator between your fingertips. The indicator is always 1cm long, and keeping your fingers at this exact fixed width, carefully step them across the desired feature on the map that you wish to measure, moving from one point to the next and counting the number of steps.

Step 1



Step 2



Step 3

Once you have finished measuring along the map feature, simply multiply the total number of steps by the distance value provided in the statement scale.



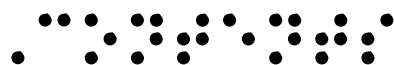
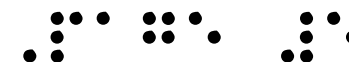
Sections in This Atlas

- 1 World
- 2 Africa
- 3 West Africa
- 4 Central Africa
- 5 Southern Africa
- 6 North Africa
- 7 East Africa
- 8 Nigeria

This atlas is organized into eight distinct sections that guide you from a global view down to specific regional and national data. It begins with the World section, mapping out the global landscape across the continents. It then continues through Africa with a broad look at Africa as a whole, followed by West Africa, Central Africa, Southern Africa, North Africa, East Africa, and a final, in-depth study of Nigeria. Throughout these sections, the maps blend political layouts with vegetation, climate, infrastructure, and trade data to give you a complete geographical understanding.



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The first pattern consists of 1 dot. The second pattern consists of 2 dots. The third pattern consists of 3 dots.

The figure consists of 10 diagrams arranged in a single row, showing the progression of a pattern of black dots. The dots are arranged in a way that suggests a branching or fractal-like growth. The first diagram shows a small cluster of dots, and subsequent diagrams show the pattern expanding and becoming more complex, with dots appearing at new positions relative to the existing structure.

A scatter plot showing the relationship between the year of birth (x-axis) and the number of children per woman (y-axis). The x-axis ranges from 1940 to 1990 in increments of 10. The y-axis ranges from 0 to 4 in increments of 1. The data points are as follows:

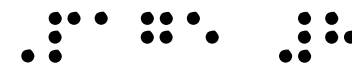
Year of Birth	Number of Children per Woman
1940	0.5
1942	2.5
1945	2.5
1946	2.0
1947	2.5
1948	2.0
1949	1.5
1950	2.0
1951	2.5
1952	2.0
1953	2.5
1954	2.0
1955	2.5
1956	2.0
1957	2.5
1958	2.0
1959	2.5
1960	2.0
1961	2.5
1962	2.0
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1976	2.0
1977	2.5
1978	2.0
1979	2.5
1980	2.0
1981	2.5
1982	2.0
1983	2.5
1984	2.0
1985	2.5
1986	2.0
1987	2.5
1988	2.0
1989	2.5
1990	2.0

Figure 1 consists of three scatter plots arranged horizontally. Each plot has 'Number of trials (n)' on the x-axis (ranging from 0 to 10) and 'Number of correct responses (N)' on the y-axis (ranging from 0 to 10). The first plot, labeled 'Control (n=10)', shows a positive correlation with a regression line. The second plot, labeled '100 Hz (n=10)', shows a negative correlation with a regression line. The third plot, labeled '200 Hz (n=10)', also shows a negative correlation with a regression line.

Figure 1 consists of two scatter plots. The left plot shows a positive correlation between the number of children in the household and the number of children in the family. The right plot shows a negative correlation between the number of children in the household and the number of children in the family.



Contents Continued



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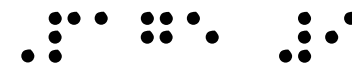
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Contents Continued



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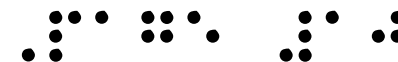
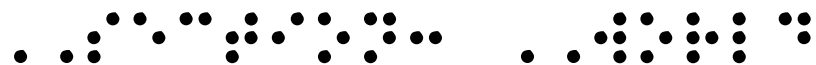
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This section provides a big picture view of the planet, mapping out the global landscape across the continents. From Antarctica to the Americas, Europe, Asia, and Oceania, these maps give you the foundational geographic context needed to understand how everything connects. It is a solid starting point to get your bearings before diving into specific regional details.

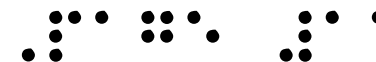
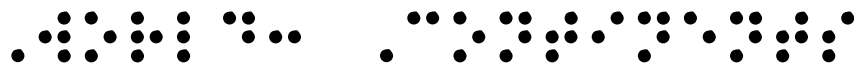
SECTION:

WORLD





World: Continents



The following world map is a simplified tactile presentation designed for legibility, placing Africa directly at the centre of the map due to the chosen map projection system. The map features South America to the southwest and North America to the northwest, both of which are aligned along the left side of the layout. Europe sits directly north of Africa and west of Asia and Asia is situated in the northeast of the layout, while the continent of Australia lies in the bottom right corner of the map.

The distorting effect inherent to flat map projections can be seen on this map because the geometry of polar landmasses has been significantly altered compared to their actual shapes on a three-dimensional globe. This distortion is most vividly demonstrated by Antarctica, which is depicted here as a horizontal strip stretching across the bottom of the map. Antarctica does not possess this linear geometry; it is a compact, circular continent cantered around the South Pole. In the dedicated map of Antarctica, the true shape is shown using a polar projection.

Also, the physical boundaries of the continents have been heavily generalized and smoothened for tactile legibility rather than showing the intricate, jagged coastlines found in real life. Furthermore, because the world contains thousands of islands that are impossible to depict at this global scale, many smaller islands have been entirely omitted from the map to maintain clarity and focus on the major landmasses.

For the large continental bodies, distinct tactile graphics are contained neatly within their borders, but some islands and peninsulas are far too narrow or small to physically hold a textured pattern. In these specific instances, the corresponding texture are drawn directly next to the island's shape in the open water. Detailed description of the textures is provided in the Legend page following the map page.

This description is also available in the audio track





World: Continents

World: Continents

World: Continents

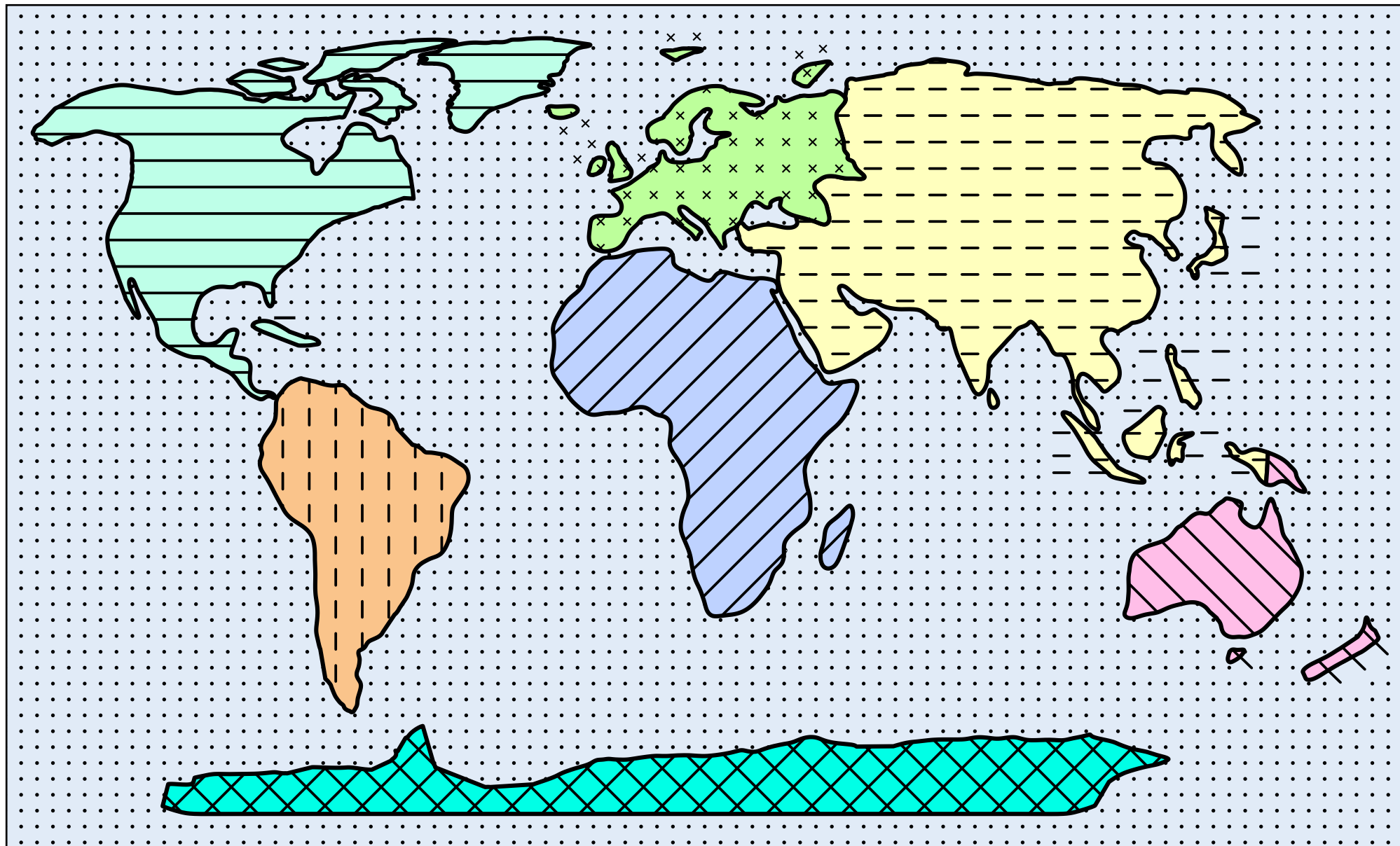
Page 12

1 cm
1,100 km

World: Continents

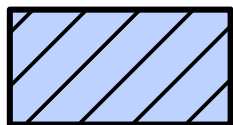
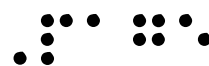
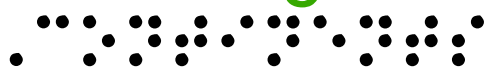
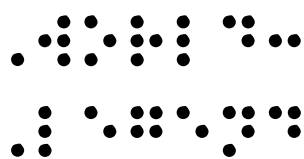
1:110,000,000

Scale represents 1,100 km

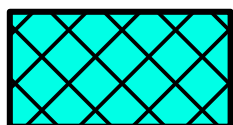
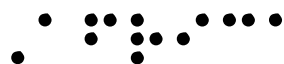




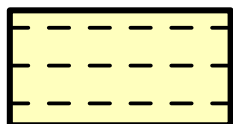
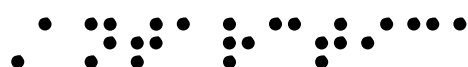
World: Continents Legend



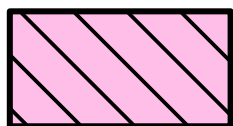
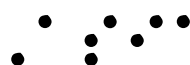
Africa



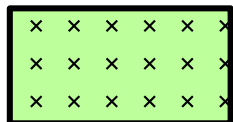
Antarctica



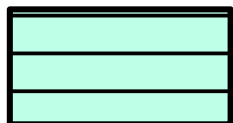
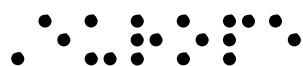
Asia



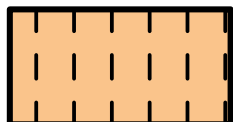
Australia



Europe



North America

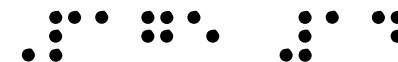


South America





North America



The following map presents North American Continent using a green fill to highlight the main landmass comprising the four major countries: Canada, the United States, Greenland, and Mexico. To provide global context and show the relative position of North America to the rest of the world, neighboring landmasses are delineated using dashed outlines. These dashed indicators can be seen in the upper left corner representing the edge of Asia, and in the lower right corner where the landmass connects toward South America.

Specific geographic locations and major cities are also identified across the continent by lettered circles containing braille texts. In the far northwestern region, Alaska is marked with circle a, while Nuuk, the capital of Greenland in the northeast is designated by circle b. Along the western Pacific coast of the main continent, circle c points directly to the location of San Francisco. The remaining major cities are distributed across the eastern and southern regions of the continent. Positioned inland near the Great Lakes area is Toronto, marked by circle d, while further east along the Atlantic coast sits New York, indicated by circle e. Finally, descending into the southern portion of the continent, Mexico City is identified by circle f.

This
description is
also available
in the audio
track

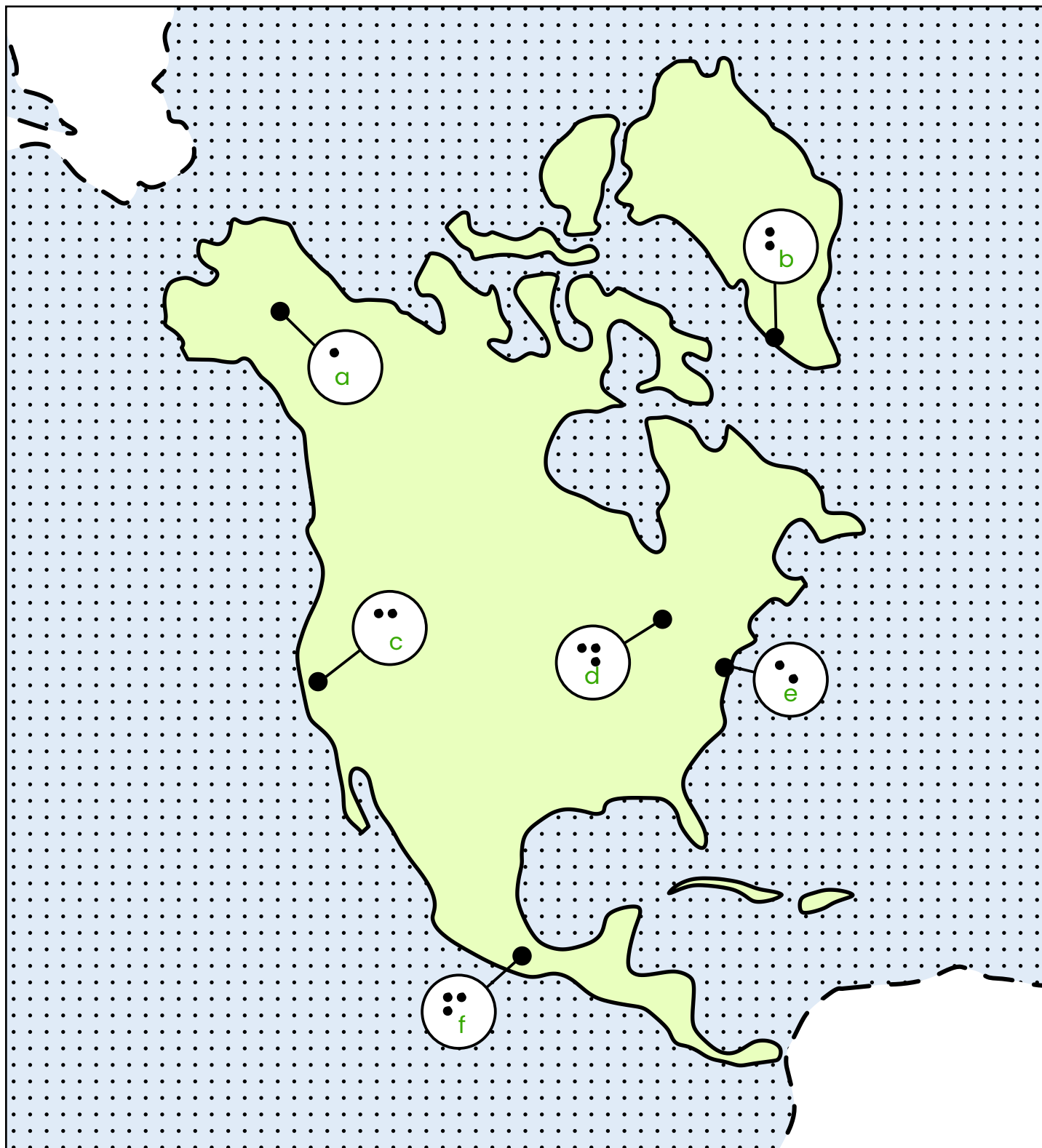


North America

1 cm
500 km

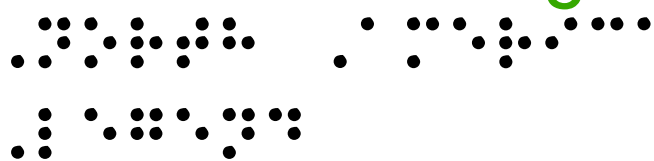
Scale represents 500 km

1:50,000,000





North America Legend



Major Cities



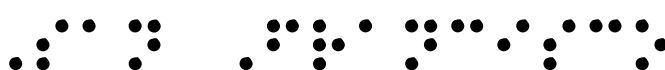
Anchorage (Alaska)



Nuuk (Greenland)



San Francisco



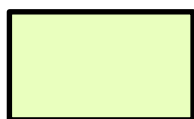
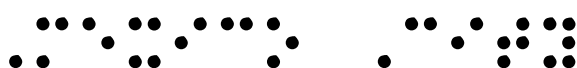
Toronto



New York



Mexico City

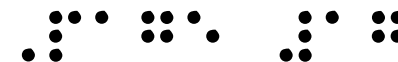


North America





South America



The following map presents the South American Continent using an orange fill to highlight the main landmass. To provide global context and show the relative position of South America to the rest of the world, neighboring landmasses are delineated using dashed outlines. These dashed indicators can be seen in the upper left corner representing the southern edge of North America Continent, and at the bottom edge representing the northernmost part of Antarctica across the ocean.

Specific geographic locations and major cities are also identified across the continent by lettered circles containing braille texts, as detailed in legend page that follows the map. Along the northern coast of the continent, Caracas is marked with circle a, while Bogota is situated slightly southwest of it in the northwestern region, designated by circle b. Moving toward the central interior of the continent, circle c points directly to the location of Santa Cruz.

The remaining major cities are distributed across the southern and eastern regions of the continent. Positioned along the Pacific coast is Santiago, marked by circle d, while further east toward the southeastern Atlantic coast sits Buenos Aires, indicated by circle e. Finally, moving further up along the eastern hump of the continent, Rio de Janeiro is identified by circle f.

This
description is
also available
in the audio
track

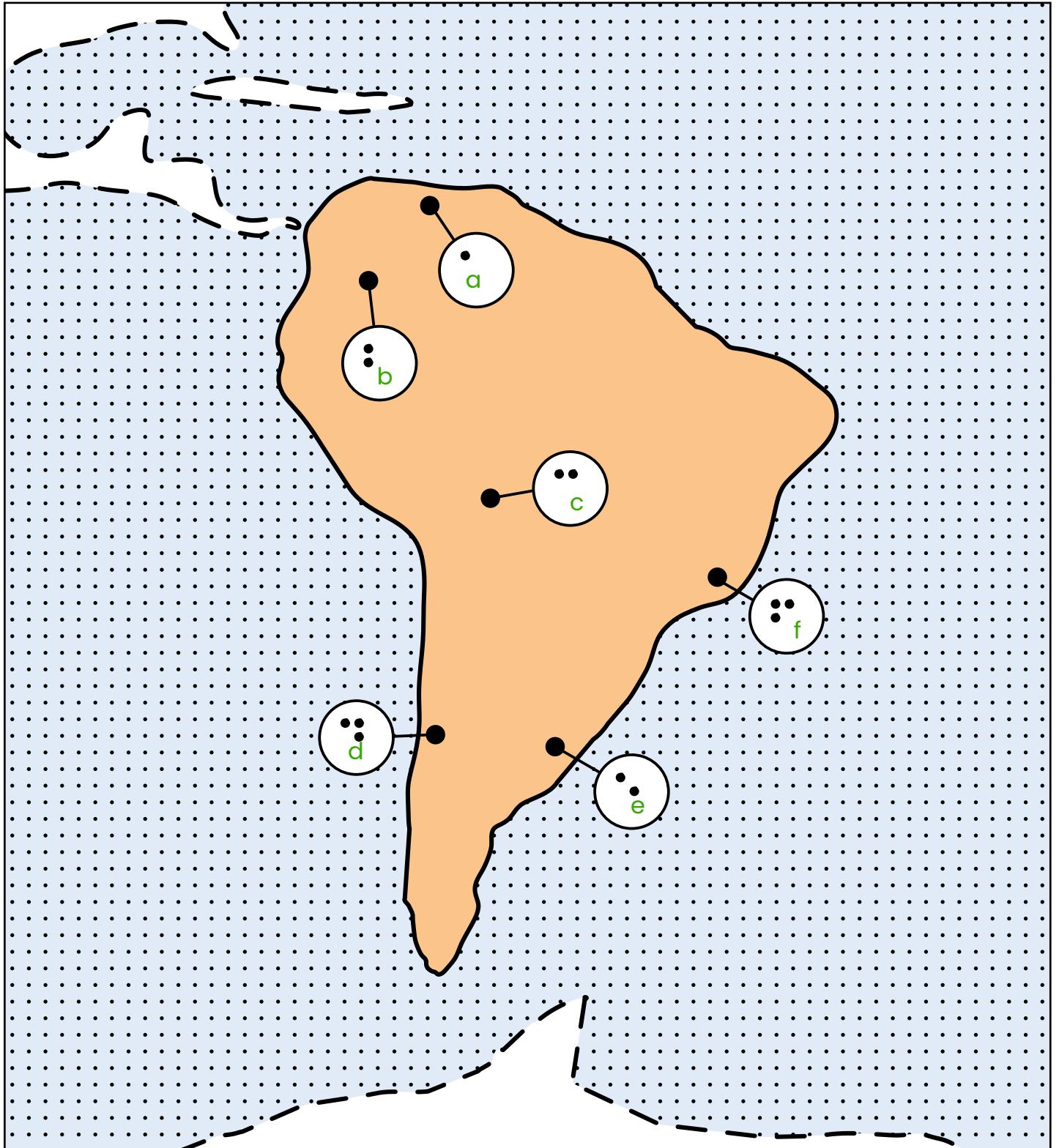


South America

1 cm
500 km

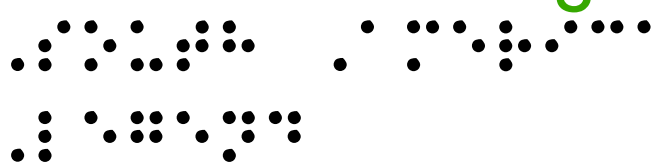
Scale represents 500 km

1:50,000,000





South America Legend



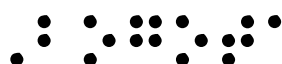
Major Cities



Caracas



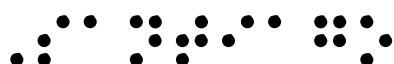
Bogota



Santa Cruz



Santiago



Buenos Aires

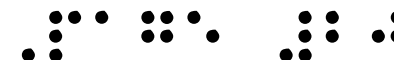


Rio de Janeiro



South America





The following map presents the continent of Asia using a solid pale-yellow fill to highlight its main landmass and primary islands. To provide global context and show the relative position of Asia to the rest of the world, neighboring landmasses are delineated using dashed outlines. These dashed indicators can be seen along the western edge to represent the border with Europe and Africa, in the upper northern area indicating North America across the strait, and at the bottom right corner representing the continent of Australia.

Specific geographic locations and major cities are also identified across the continent by lettered circles containing braille labels, as detailed in the legend that follows the map page. Toward the central-western region, Kabul is identified by circle a, while further southwest on the Arabian Peninsula, Dubai is marked with circle b. Directly south in the prominent Indian subcontinent, circle c points to the location of New Delhi.

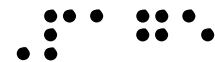
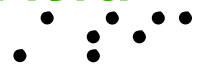
The remaining major cities are distributed across the eastern and southeastern territories of the continent. Positioned in mainland Southeast Asia is Bangkok, indicated by circle d, while further northeast in the continental interior sits Beijing, marked by circle e. Finally, situated on the prominent island chain off the eastern coast, Tokyo is identified by circle f, completing the geographic distribution of these major urban hubs.

This
description is
also available
in the audio
track



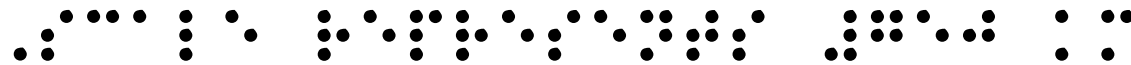


Asia



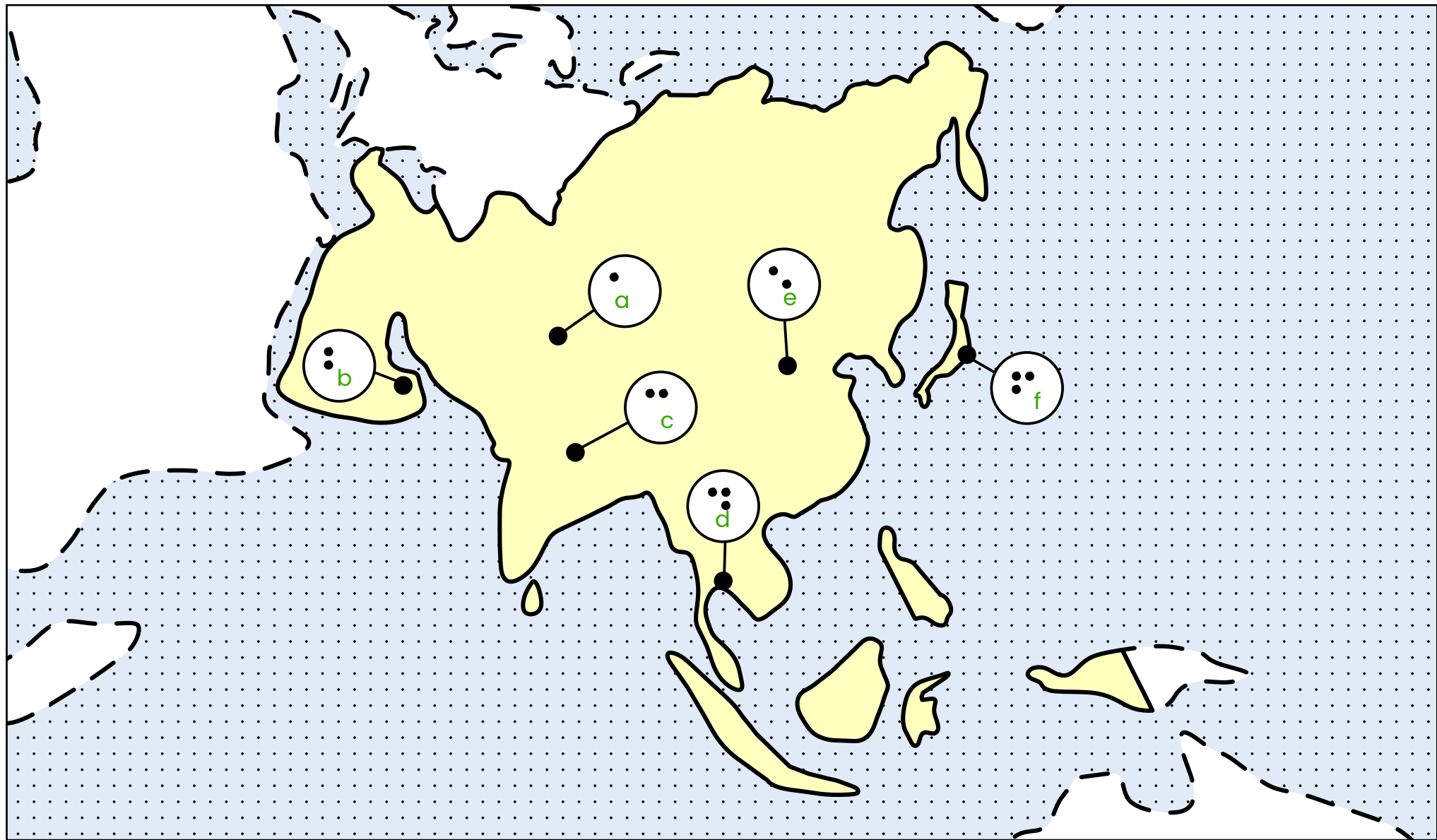
1 cm

750 km



1:75,000,000

Scale represents 750 km





Asia Legend

Asia Legend

Asia Legend

Major Cities

Major Cities



Kabul

Kabul



Dubai

Dubai



New Delhi

New Delhi



Bangkok

Bangkok



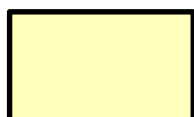
Beijing

Beijing



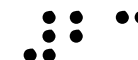
Tokyo

Tokyo



Asia

Asia



The following map presents the continent of Europe using a solid pale green fill to highlight its main landmass along with its major peninsulas and offshore islands. To provide global context and show the relative position of Europe to the rest of the world, neighboring landmasses are delineated using dashed outlines. These dashed indicators can be seen along the southern edge, representing the coast of North Africa across the Mediterranean Sea, at the northwest, representing Greenland and where the continent merges with Asia toward the east.

Specific geographic locations and major cities are also identified across the continent by lettered circles containing braille labels, each connected by a short line to a small dot marking its precise location, as detailed in the legend that follows the map page. Toward the west, Paris is identified by circle a, while further southwest Barcelona is marked with circle b. Directly south of there, circle c points to the location of Rome.

The remaining major cities are distributed across the central and eastern territories of the continent. Positioned in the interior of central Europe is Budapest, indicated by circle d, while further east sits Kyiv, marked by circle e. Finally, situated furthest to the north and east of this group, Moscow is identified by circle f, completing the geographic distribution of the major cities.

This
description is
also available
in the audio
track

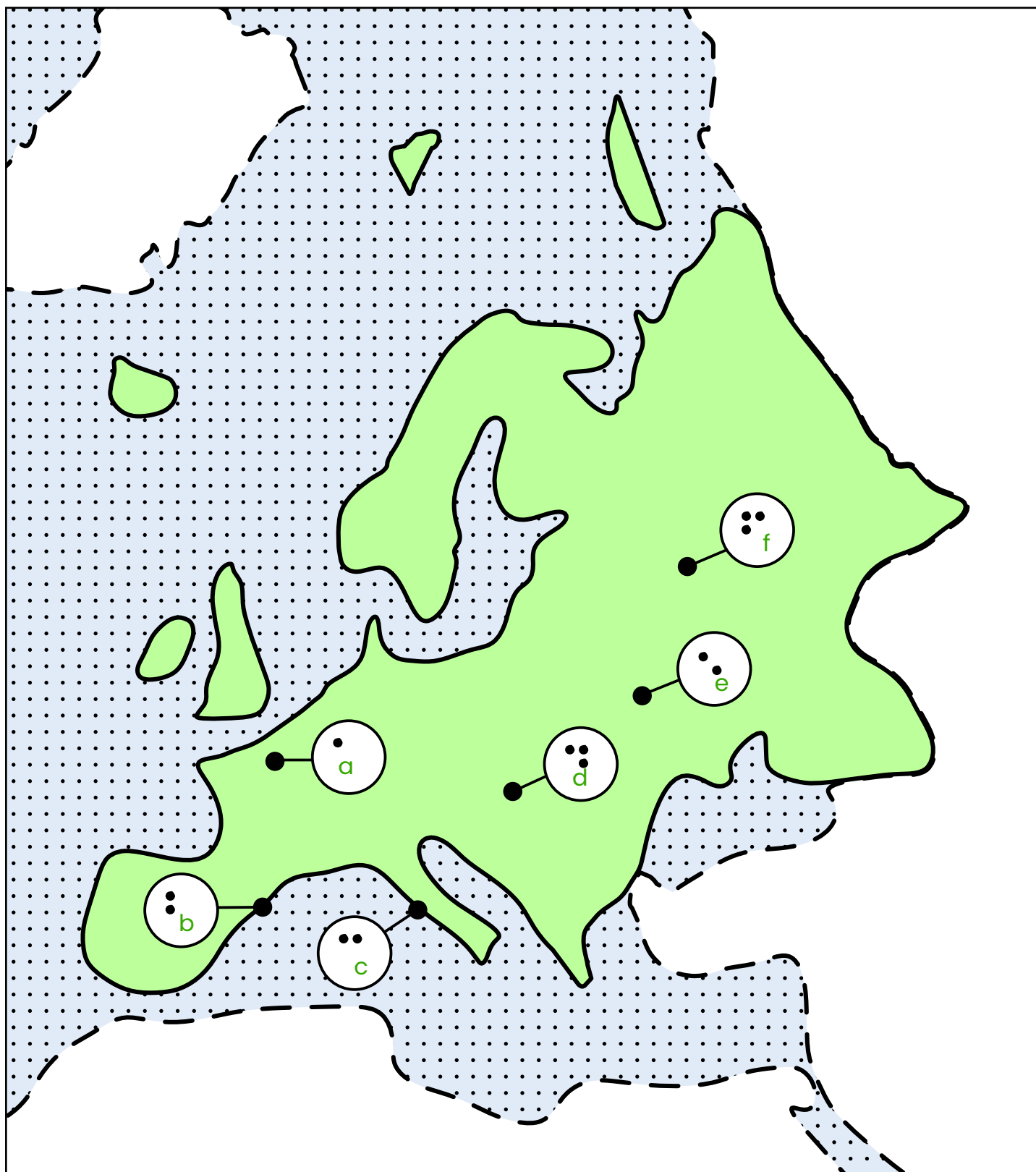


Europe

1 cm
300 km

Scale represents 300 km

1:30,000,000





Europe Legend

Braille representation of the title 'Europe Legend'.

Braille representation of the page number 'Page 25'.

Major Cities

Braille representation of the section title 'Major Cities'.



Paris

Braille representation of the word 'Paris'.



Barcelona

Braille representation of the word 'Barcelona'.



Rome

Braille representation of the word 'Rome'.



Budapest

Braille representation of the word 'Budapest'.



Kyiv

Braille representation of the word 'Kyiv'.



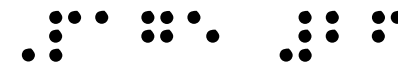
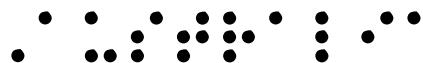
Moscow

Braille representation of the word 'Moscow'.



Europe

Braille representation of the word 'Europe'.



The following map presents the continent of Australia, together with the surrounding region of Oceania, using a solid pale pink fill to highlight its main landmass, the large island of Papua New Guinea to the north, and the island chain of New Zealand to the southeast. Neighboring landmasses are delineated using dashed outlines in the upper left area, representing the islands of Southeast Asia that lie across the water toward Asia. The remaining dotted area represents water, namely the Indian Ocean to the west and the Pacific Ocean to the east and south, with the small island of Tasmania shown off the southern coast.

Major cities are identified by lettered circles containing braille labels, as detailed in the legend that follows the map page. On the western side of the mainland, Perth is identified by circle a, while toward the south of center along the coast, Adelaide is marked with circle b. Further east along the southeastern coast, circle c points to the location of Sydney.

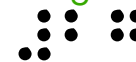
The remaining cities lie to the north and southeast of the mainland. Positioned on the large island of Papua New Guinea, above the continent, is Port Moresby, indicated by circle d. Off to the southeast on New Zealand, Auckland is marked by circle e on the northern island, while further south on the lower island sits Christchurch, identified by circle f.

This
description is
also available
in the audio
track

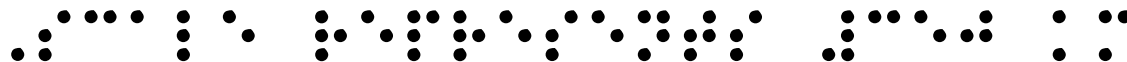




Australia

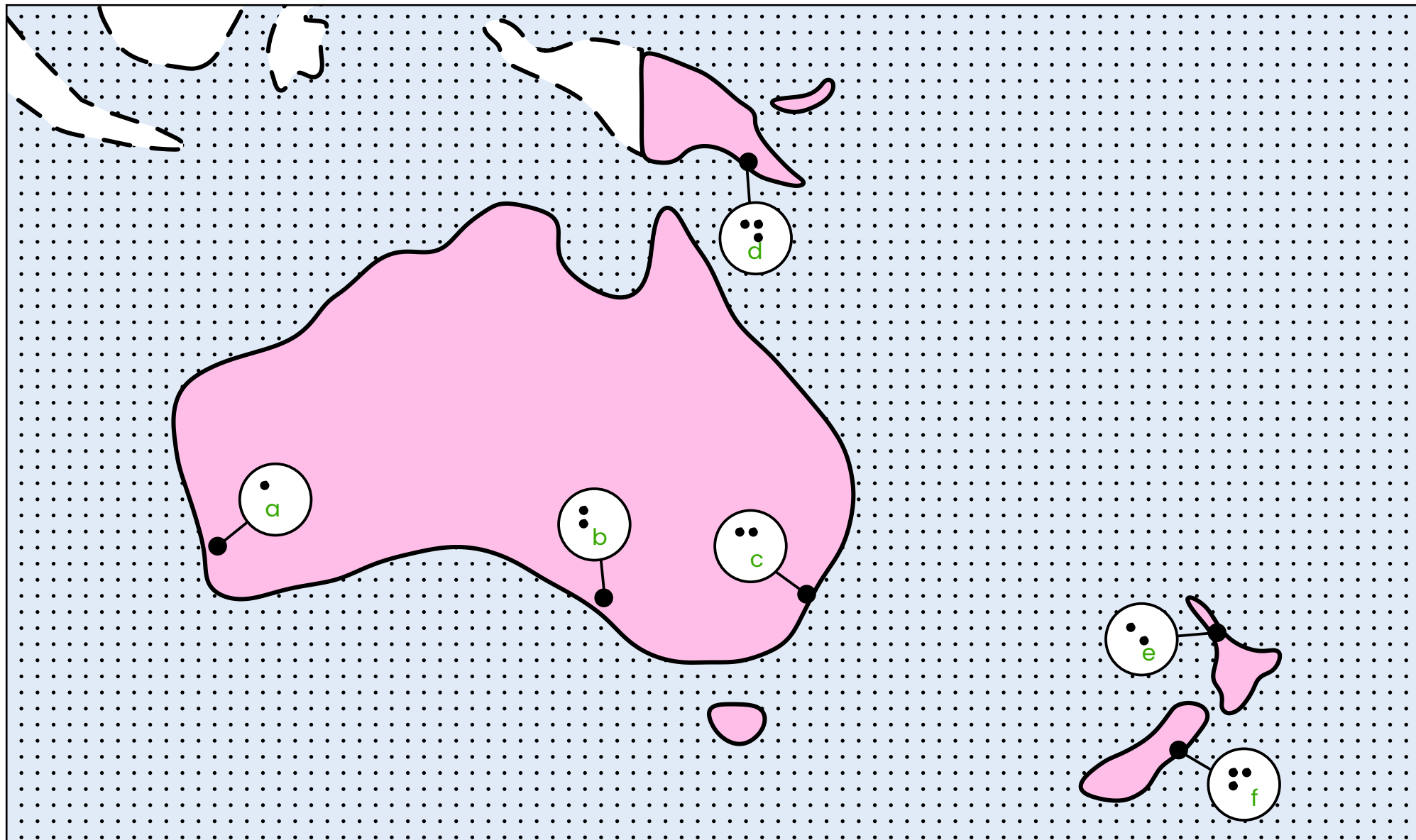


1 cm
350 km



1:35,000,000

Scale represents 350 km



Australia Legend

Major Cities



Perth



Adelaide

Sydney



Port Moresby

A diagram of a hydrogen atom. It consists of a central nucleus, represented by a small black dot, and a single electron, represented by a green letter 'e' with a dot above it, orbiting the nucleus. The entire atom is enclosed within a large circle.

Auckland

A 4x10 grid of dots representing a binary image. The dots are arranged in a pattern that resembles a stylized letter 'A' or a similar character.



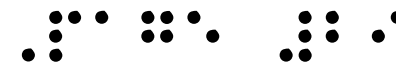
Christchurch



Australia



Antarctica



The following map presents the continent of Antarctica using a solid pale tan fill to highlight its landmass, drawn with the WGS 1984 Antarctic Polar Stereographic projection. Because this projection is centered directly on the South Pole, the continent appears in its true circular form. Neighboring landmasses are delineated using dashed outlines around the outer margins of the map namely South America to the top left, Africa to the top right and Australia to the bottom center and right.

Antarctica sits in isolation at the bottom of the world, separated from every other continent by wide stretches of the Southern Ocean. Its closest neighbor is South America, roughly 1,000 km away across the Drake Passage, which is why most polar explorers and expeditions depart through Chile and Argentina. Australia and Oceania are about 2,500 km away, while South Africa is roughly 4,000 km away.

Unlike the other maps in this section, no cities are marked here. Instead, the single most important feature is identified by circle a, connected by a short line to a dot marking the location of the South Pole near the center of the continent. This point is the southernmost place on Earth, where all lines of longitude converge. A magnetic compass is effectively useless while standing here, because every direction one can face from the South Pole points toward true North.

This description is also available in the audio track



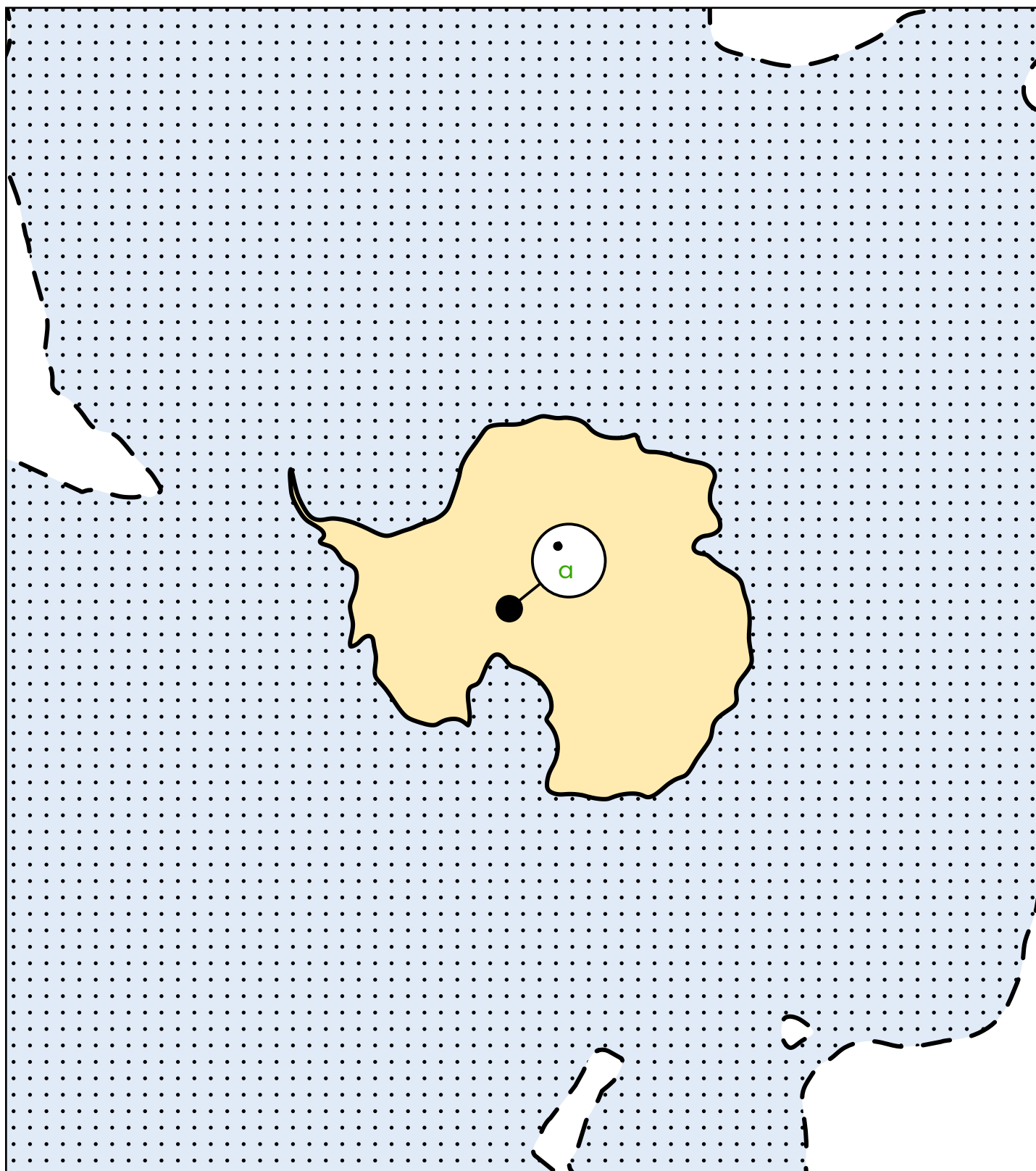
Antarctica

Page 30

1 cm
600 km

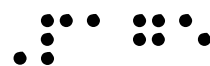
Scale represents 600 km

1:60,000,000

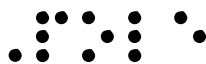
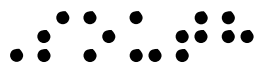




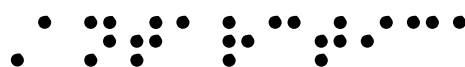
Antarctica Legend



South Pole



Antarctica





The following map presents the continent of Africa, using a solid pale green fill to highlight its landmass. Neighboring landmasses are delineated using dashed outlines across the top and along the upper right, representing southern Europe beyond the Mediterranean Sea and western Asia beyond the narrow strip of water at the northeastern corner. The remaining dotted area represents water, namely the Atlantic Ocean to the west and south and the Indian Ocean to the east, with the long, narrow island of Madagascar shown off the southeastern coast. The outline rises again on the eastern side to a sharp projection known as the Horn of Africa.

Major cities are identified by lettered circles containing braille labels, as detailed in the legend that follows the map page. Bamako is identified by circle a in the west, while a little to the east and slightly lower, Niamey is marked with circle b. Further southeast along the coast, where the land curves inward at the Gulf of Guinea, circle c points to the location of Lagos.

The remaining cities lie across the eastern and southern parts of the continent. In the far northeast, near the Mediterranean coast, Cairo is indicated by circle d, and inland from the Horn of Africa, toward the east, circle e points to Addis Ababa. Well down in the southeast sits Harare, marked by circle f, while further south again, near the lower end of the continent, Johannesburg is identified by circle g.

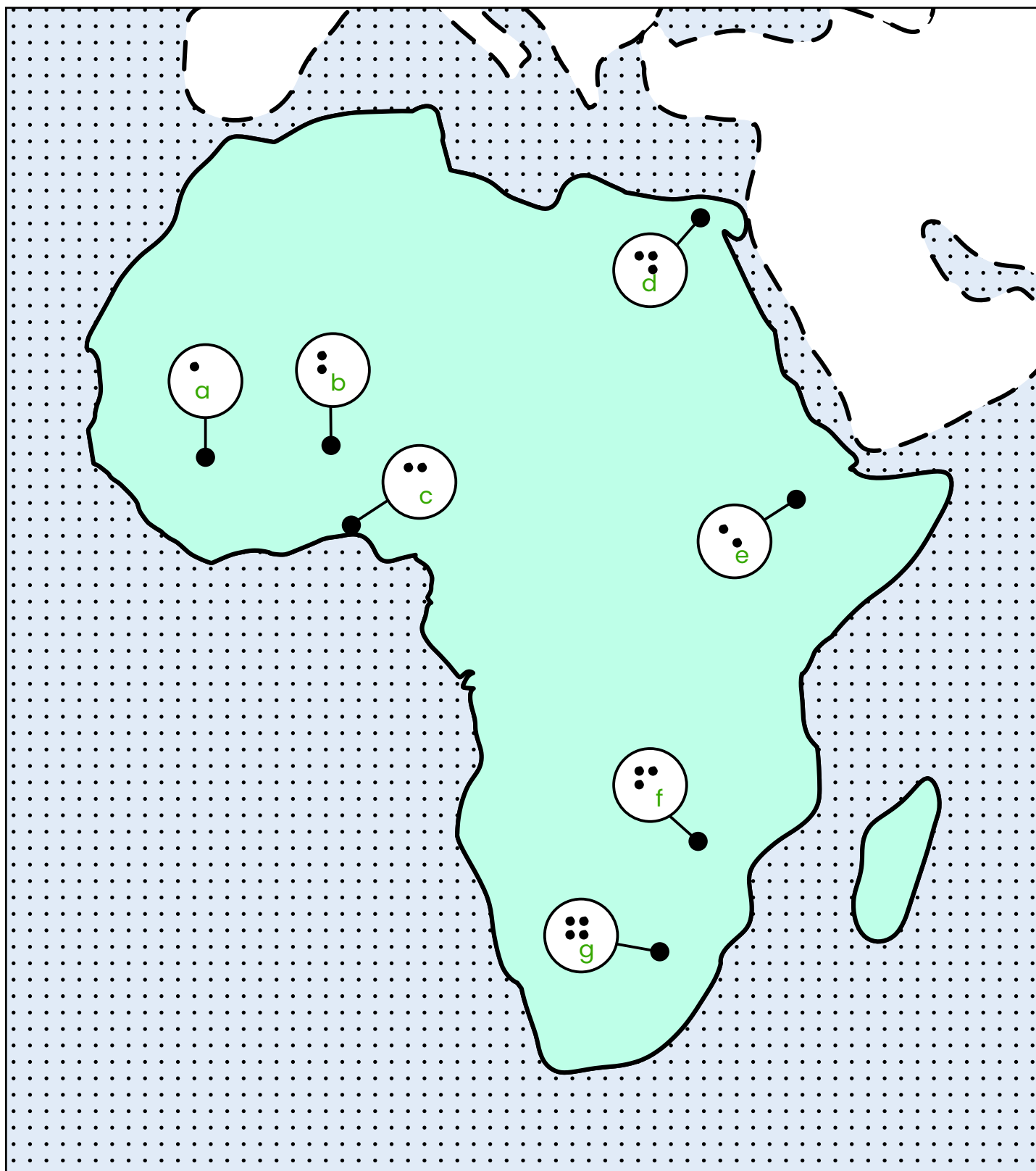
This
description is
also available
in the audio
track

Africa

1 cm
450 km

Scale represents 450 km

1:45,000,000



Africa Legend

Major Cities



Bamako



Niamey



Lagos



Cairo

Addis Ababa



Harare

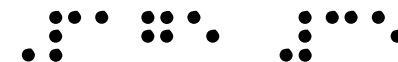
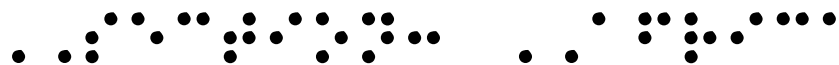
Johannesburg

The image shows three distinct dot patterns arranged horizontally. The first pattern on the left consists of 10 dots arranged to form the number '1'. The middle pattern consists of 12 dots arranged to form the number '2'. The third pattern on the right consists of 14 dots arranged to form the number '3'.



Africa

Hours per week working	Hours per week exercising
2	1
5	8
8	9
10	7
12	9
13	6
14	5
15	4
16	3
18	6
20	5
22	4
25	9
28	9
30	9
32	9



Zooming in on the African continent, this section covers its diverse political boundaries and natural environments. You will find detailed look at West, Central, Southern, North, and East Africa. By pairing political layouts with vegetation maps, this collection shows exactly how the regional landscapes and ecosystems shape the borders and environments of these nations.

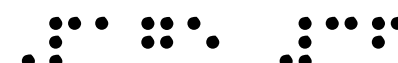
SECTION:

AFRICA





Africa Regions



The following map presents the continent of Africa divided into its five main regions, each filled with a different texture. Neighboring landmasses are delineated using dashed outlines across the top and along the upper right, representing southern Europe and western Asia, while the remaining dotted area represents the surrounding oceans.

Across the top of the continent, North Africa is filled with vertical lines. Below it on the left, West Africa is filled with horizontal lines. Down the eastern side, reaching from the Horn of Africa to the middle of the continent, East Africa is filled with left-slanted lines. Between West Africa and East Africa, in the middle of the continent just below the Gulf of Guinea, Central Africa is filled with crossed lines that form a diamond grid. In the lower portion of the continent is Southern Africa, filled with right-slanted lines, and the long narrow island of Madagascar off the southeastern coast carries this same pattern.

The legend that follows the map page lists each of the five textures in turn, giving Central Africa, East Africa, North Africa, West Africa and Southern Africa.

This description is also available in the audio track

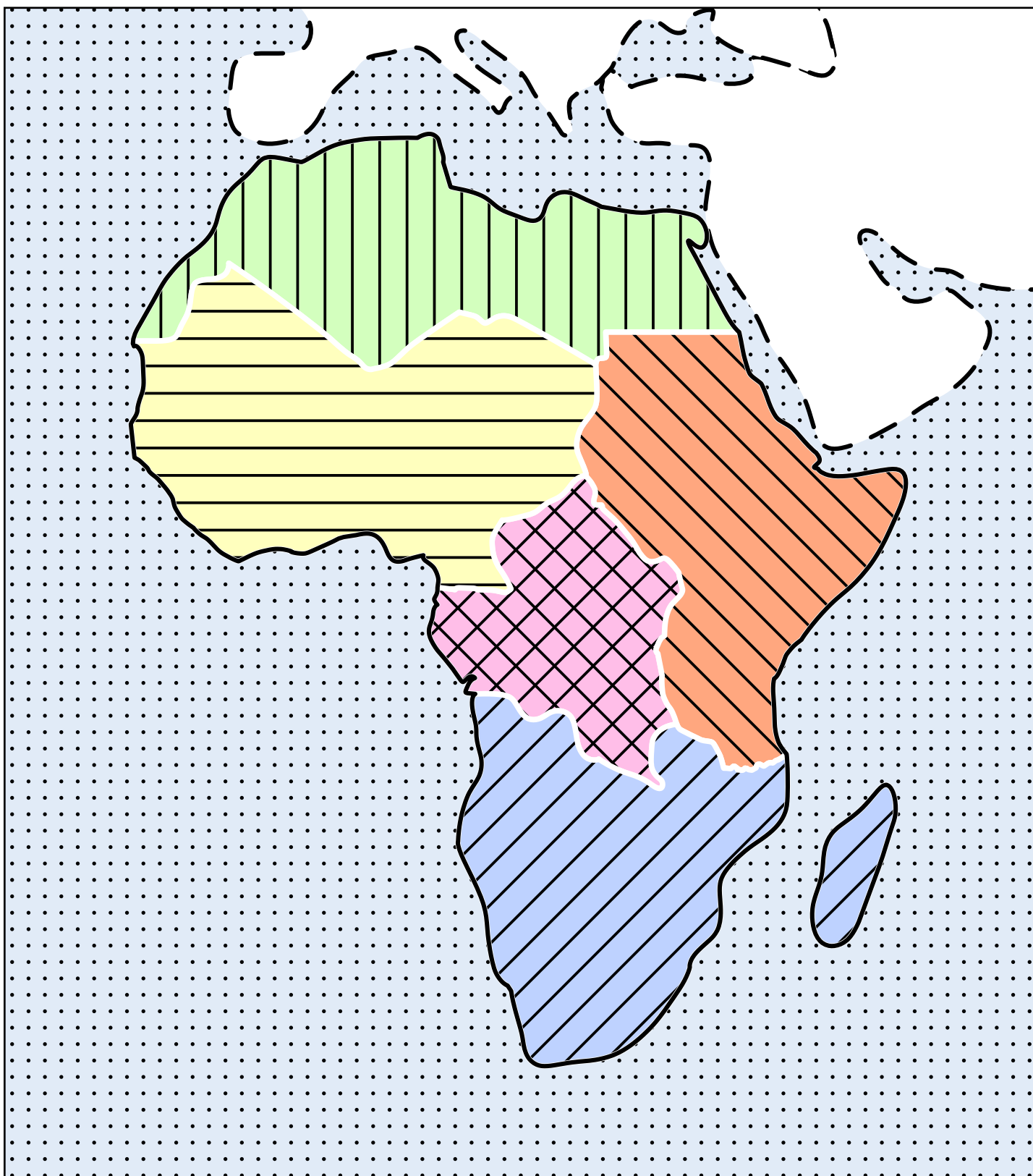


Africa: Regions

1 cm
450 km

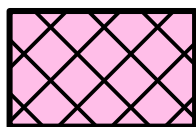
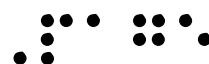
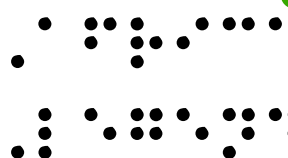
Scale represents 450 km

1:45,000,000

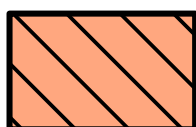




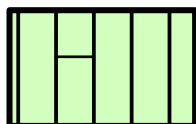
Africa Regions Legend



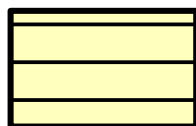
Central Africa



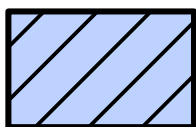
East Africa



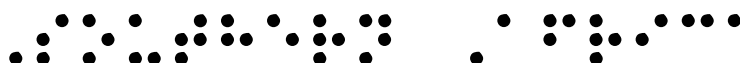
North Africa



West Africa

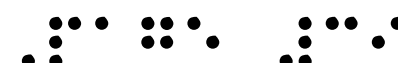
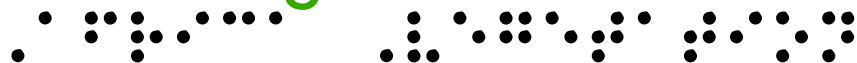


Southern Africa





Africa Vegetation



The following map presents the vegetation of the African continent in four quantitative categories using textures. Neighboring landmasses are delineated using dashed outlines across the top and along the upper right, representing southern Europe and western Asia, while the remaining dotted area represents the surrounding oceans.

The textures are arranged in bands. The north of the continent is sparse, where the land is driest. Moving south, the sparse band gives way to a band of low vegetation. South of that comes moderate vegetation, and at the centre of the continent, around the equator, sits the dense vegetation where rainfall is highest and plant growth is thickest. Below the centre the pattern reverses and repeats in the same order, passing back out through moderate, then low, and finally sparse again at the southern tip. The island of Madagascar off the southeastern coast carries the low texture.

The legend that follows the map page lists the four categories in order from dense, through moderate and low, to sparse, along with the dashed outline used for other continents and countries. This same legend can be used for all of the vegetation maps in this atlas, so once the four textures are learned by touch, they can be applied to every vegetation map in the series.

This description is also available in the audio track



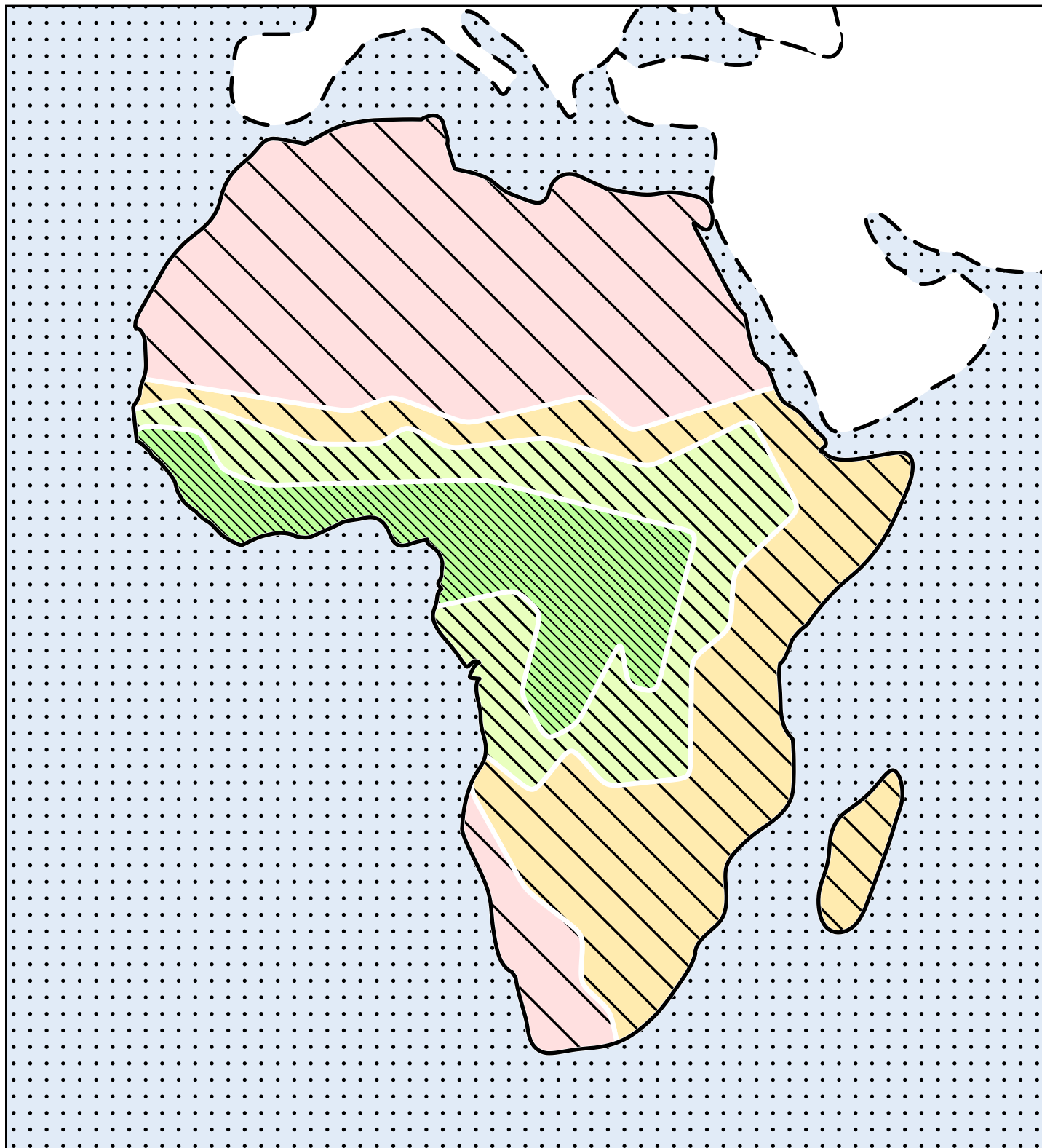
Africa: Vegetation 2025

Page 40

1 cm
450 km

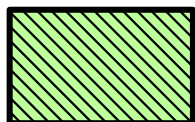
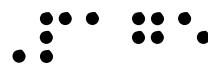
Scale represents 450 km

1:45,000,000

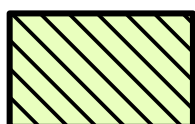




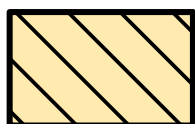
Vegetation Legend



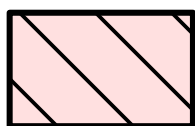
Dense



Moderate



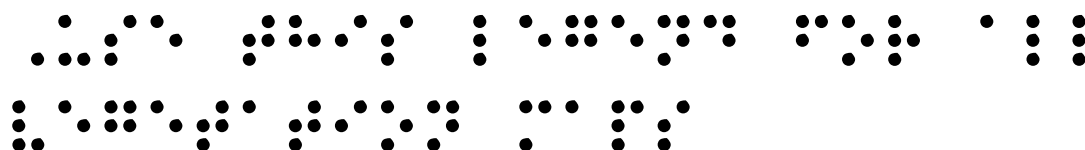
Low



Sparse



Use this legend for all vegetation maps





Central Africa: Political

Braille representation of the title and page number.

Braille representation of the title and page number.

The following map presents the countries of Central Africa Region, with each member country given a solid outline and its own fill. Surrounding countries beyond the region are delineated using dashed outlines along the top, the right side and the lower edge, and the dotted area on the left represents the water of the Atlantic Ocean at the Gulf of Guinea. The largest country on the map lies across the centre and right, reaching from the middle of the page down toward the bottom, and it is labelled directly on the map in braille as Congo DRC.

Remaining countries are identified by lettered circles containing braille labels, as detailed in the legend that follows the map page, with each circle joined by a short line to the place it marks. Out in the water off the coast, Sao Tome and Principe is identified by circle a, marking a pair of small islands. Just to the east of it, on the mainland coast, circle b points to the narrow strip of Equatorial Guinea. Below and to the right of that strip, filling the coastal area, Gabon is marked with circle c, and immediately east of Gabon sits Republic of the Congo, indicated by circle d. In the upper middle of the map, north of Congo DRC, the Central African Republic is identified by circle e. The legend also shows the solid outline used for member countries and the dashed outline used for other continents and countries.

This description is also available in the audio track

Braille representation of the title and page number.

Central Africa: Political

Page 43

Central Africa: Political

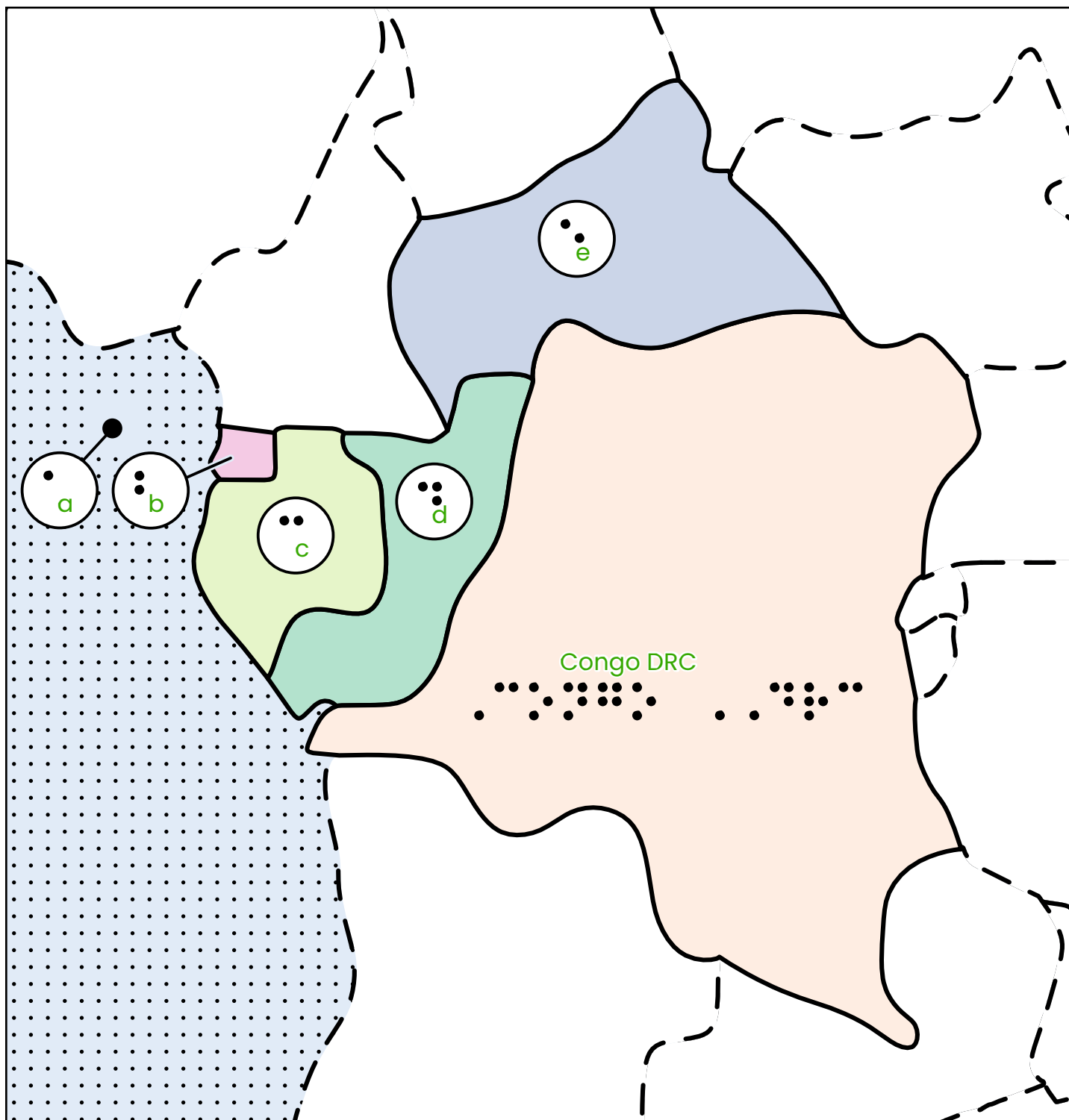
Central Africa: Political

1 cm
150 km

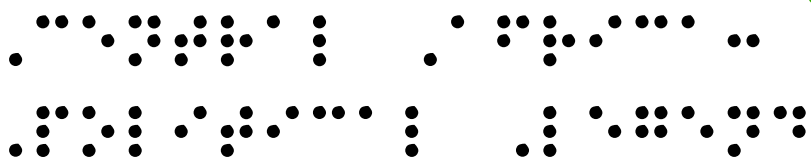
Scale represents 150 km

1:15,000,000

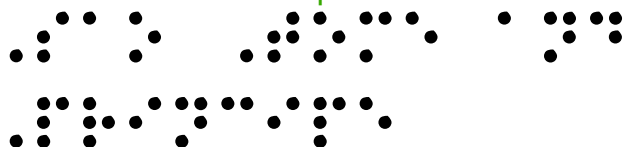
Scale represents 150 km



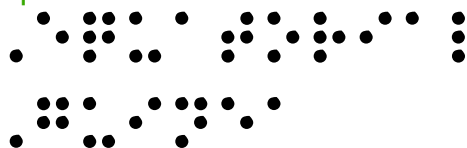
Central Africa: Political Legend



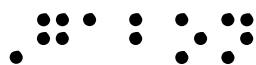
Sao Tome and Principe



Equatorial Guinea



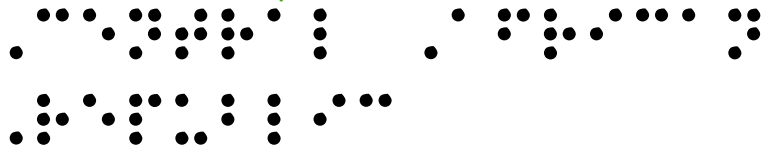
Gabon



Republic of the Congo



Central African Republic

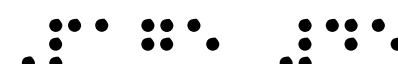


Member Countries





Central Africa: Vegetation



The following map presents the region of Central Africa textured and shaded to show how much plant life covers the land, using the same four textures as the other vegetation maps. Neighbouring countries beyond the region are delineated using dashed outlines around the edges, and the dotted area on the left represents the water of the Atlantic Ocean at the Gulf of Guinea.

The textures are arranged in rings rather than bands. At the heart of the region lies a large area of dense vegetation, the thickest plant cover on the map, which is where the equatorial rainforest of the Congo Basin grows. Around that core runs a ring of moderate vegetation. Beyond it, following the outer parts of the region, comes a ring of low vegetation, reaching the coast in the west and the borders in the north and east. In one corner in the southeast, the driest part of the region, the fill changes to sparse vegetation. Reading from the centre outward, then, the pattern moves from dense, to moderate, to low, and finally to sparse.

This shows that plant growth is heaviest at the middle of the region and thins out steadily as you move away from it in any direction. The legend for this map is the same one used for all of the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.



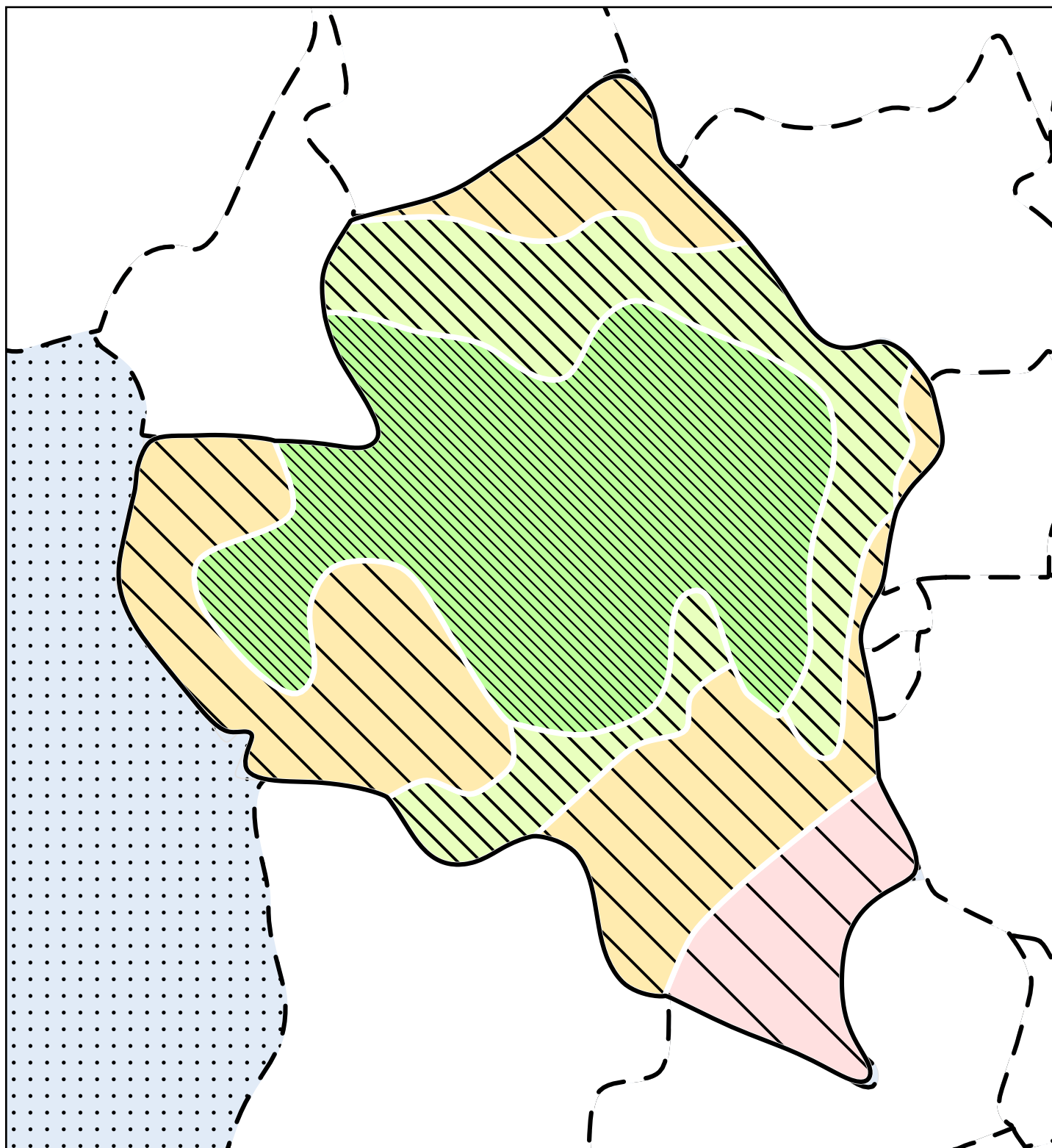
Central Africa Vegetation 2025

Page 46

1 cm
130 km

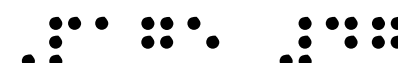
Scale represents 130 km

1:13,000,000





East Africa: Political



The following map presents the countries of East Africa, with each member country given a solid outline and its own fill. Surrounding countries are delineated using dashed outlines, and the dotted area filling the right side of the page represents the water of the Indian Ocean and the Red Sea. Sudan sits in the upper left corner, and Ethiopia occupies the middle of the map, sharing a border with Sudan to its west and reaching across toward the coast in the east. Other countries are marked with a lettered circle sometimes joined by a short line to the country it points to.

Beginning in the west, South Sudan is identified by circle c, lying south of Sudan. Below it is Uganda, marked with circle d, and pressed against the western edge beneath Uganda are two very small countries, one above the other, with Rwanda identified by circle a, and Burundi by circle b directly below it. East of Uganda, in the centre of the map and running down to the coast, Kenya is indicated by circle e, and south of Kenya, filling the lower part of the region, Tanzania is marked with circle f. Along the northeastern coast lie three more countries: Eritrea is identified by circle j, sitting north of Ethiopia on the Red Sea, the very small country of Djibouti is wedged in beside it and is marked by circle i, and Somalia, indicated by circle h. Out on its own in the ocean to the southeast, circle g marks the island group of the Seychelles. The legend also shows the solid outline used for member countries and the dashed outline used for other continents and countries.

This description is also available in the audio track



East Africa: Political

East Africa: Political

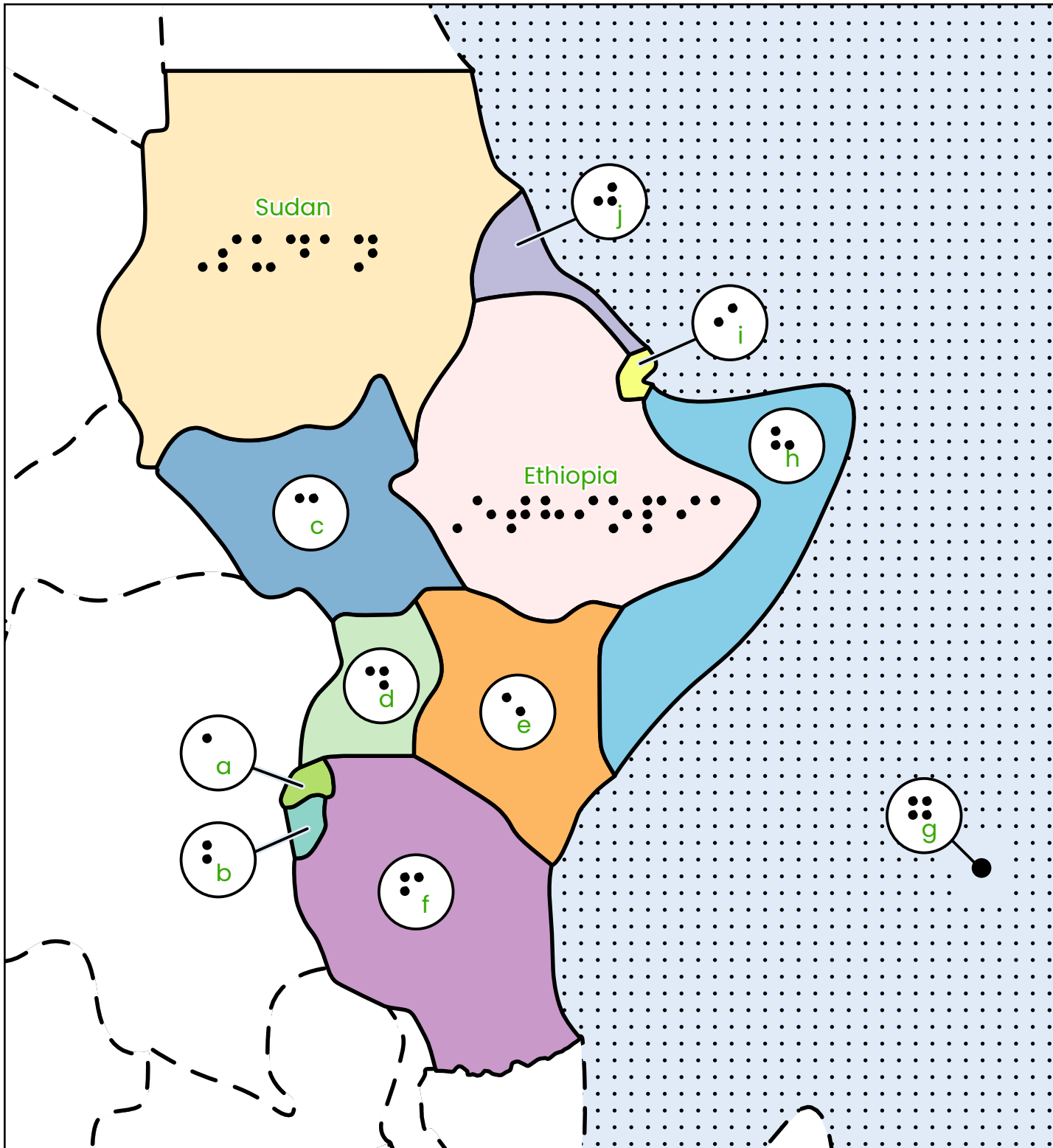
East Africa: Political

1 cm
200 km

Scale represents 200 km

1:20,000,000

East Africa: Political



East Africa: Political Legend

Braille representation of the title and page number.

Braille representation of the title and page number.



Rwanda

Braille representation of the word 'Rwanda'.



Somalia

Braille representation of the word 'Somalia'.



Burundi

Braille representation of the word 'Burundi'.



Djibouti

Braille representation of the word 'Djibouti'.



South Sudan

Braille representation of the word 'South Sudan'.



Eritrea

Braille representation of the word 'Eritrea'.



Uganda

Braille representation of the word 'Uganda'.



Kenya

Braille representation of the word 'Kenya'.



Tanzania

Braille representation of the word 'Tanzania'.



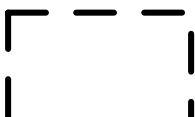
Seychelles

Braille representation of the word 'Seychelles'.



Member Countries

Braille representation of the phrase 'Member Countries'.

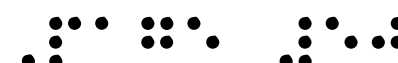
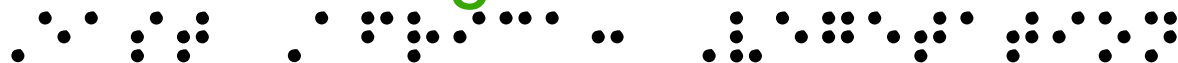


Other Continents

Braille representation of the phrase 'Other Continents'.



East Africa: Vegetation



The following map presents the region of East Africa shaded to show how much vegetation covers the land, using the same four textures as the other vegetation maps. Neighbouring countries beyond the region are delineated using dashed outlines on the left and along the lower edge, and the dotted area on the right represents the water of the Indian Ocean. The textures are arranged in bands that run from the north down to the south. The northern end of the region is sparse, where the land is driest, and this same sparse texture reappears in a small stretch along the northern part of the coast. Below the northern band comes low vegetation, which also follows much of the eastern side of the region down toward the coast. Inland from that lies a wide area of moderate vegetation covering the western and central parts of the region and continuing southward. Set within it are patches of dense vegetation, the thickest plant cover on the map, found in the higher, wetter middle of the region.

Reading from north to south, then, the pattern moves from sparse, through low, into moderate, with dense appearing where vegetation cover is highest. Reading from the coast inland, the land generally grows greener as you move west and away from the sea. The legend for this map is the same one used for all the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.

This description is also available in the audio track

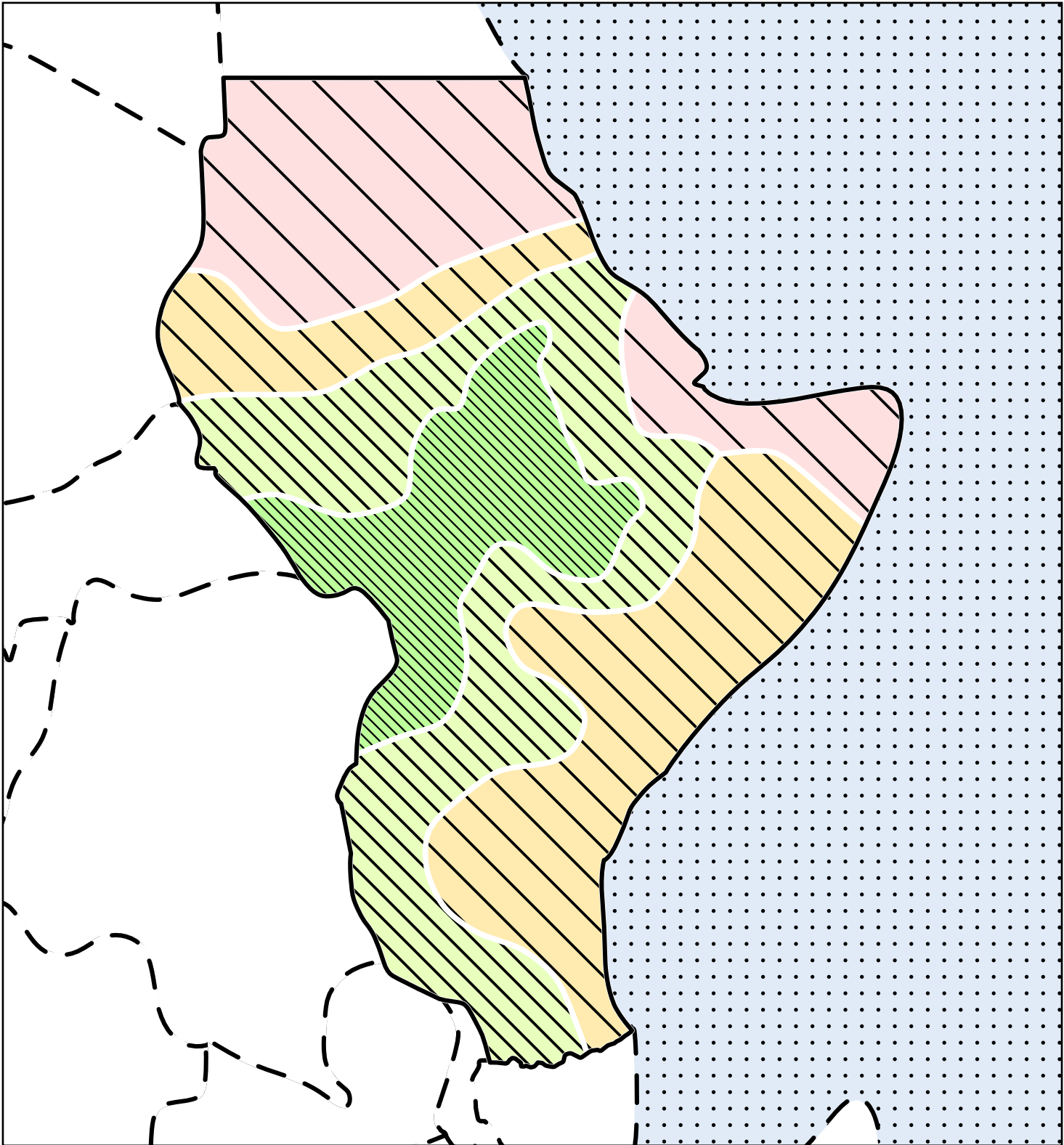


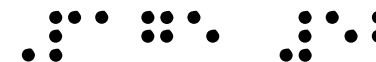
East Africa: Vegetation 2025

1 cm
200 km

Scale represents 200 km

1:20,000,000





The following map presents the countries of North Africa, with each member country given a solid outline and its own fill. Surrounding countries beyond the region are delineated using dashed outlines along the lower edge and toward the upper right, and the dotted area represents water, namely the Atlantic Ocean at the far left, the Mediterranean Sea running the whole way along the top, and the Red Sea at the far right. Three countries are labelled directly on the map in braille; Algeria sits toward the left, taking up a large block of the western half, Libya lies to its east in the middle of the map, and Egypt occupies the right end of the band, reaching the Red Sea in the northeast.

The two remaining countries are identified by lettered circles. At the western end of the region, along the Atlantic coast and curving up to the Mediterranean, Morocco is identified by circle a. Between Algeria and Libya, on the Mediterranean coast at the top of the map, circle b points to the location of Tunisia. Reading from west to east, then, the five countries follow in order as Morocco, Algeria, Tunisia, Libya and Egypt, all of them fronting the Mediterranean Sea along the northern edge of the continent. The legend also shows the solid outline used for member countries and the dashed outline used for other continents and countries.

This description is also available in the audio track



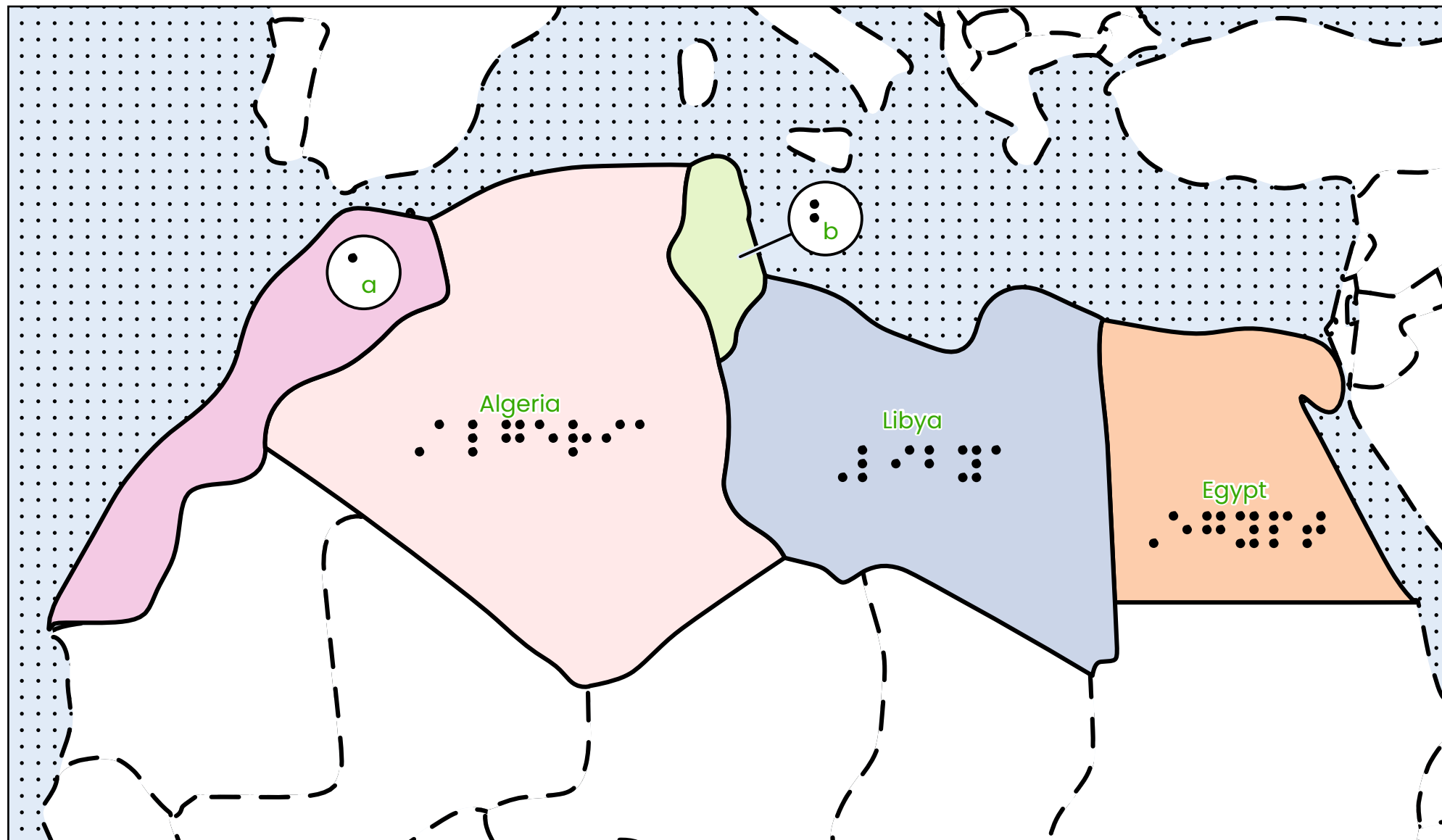


North Africa: Political

1 cm
200 km

1:20,000,000

Scale represents 200 km



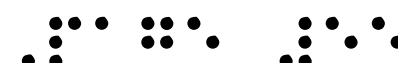


Member Countries





North Africa: Vegetation



The following map presents the region of North Africa shaded to show how much vegetation covers the land, using the same four textures as the other vegetation maps. Neighbouring countries beyond the region are delineated using dashed outlines around the edges, and the shape of the region itself is wide from left to right and shallow from top to bottom, so it sits across the page like a broad band. Almost the whole of the region has sparse vegetation, because most of this land is desert. The greener textures appear only in narrow places. Along the northern coast, where the land meets the Mediterranean Sea, there is a thin strip of low vegetation, and set within it are small patches of dense vegetation right at the water's edge. A similar narrow strip of dense vegetation runs down the eastern side of the region, following the course of the Nile. Two small, rounded patches of moderate vegetation sit on their own in the middle of the desert, marking the higher ground where a little more rain falls.

Reading this map, the lesson is one of contrast. Vegetation in North Africa clings to the edges and to a single river, while the vast middle stays sparse throughout. It is the only vegetation map in the book where one texture covers nearly everything, and the small green shapes stand out clearly against it when you run your fingers across. The legend for this map is the same one used for all the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.

This description is also available in the audio track



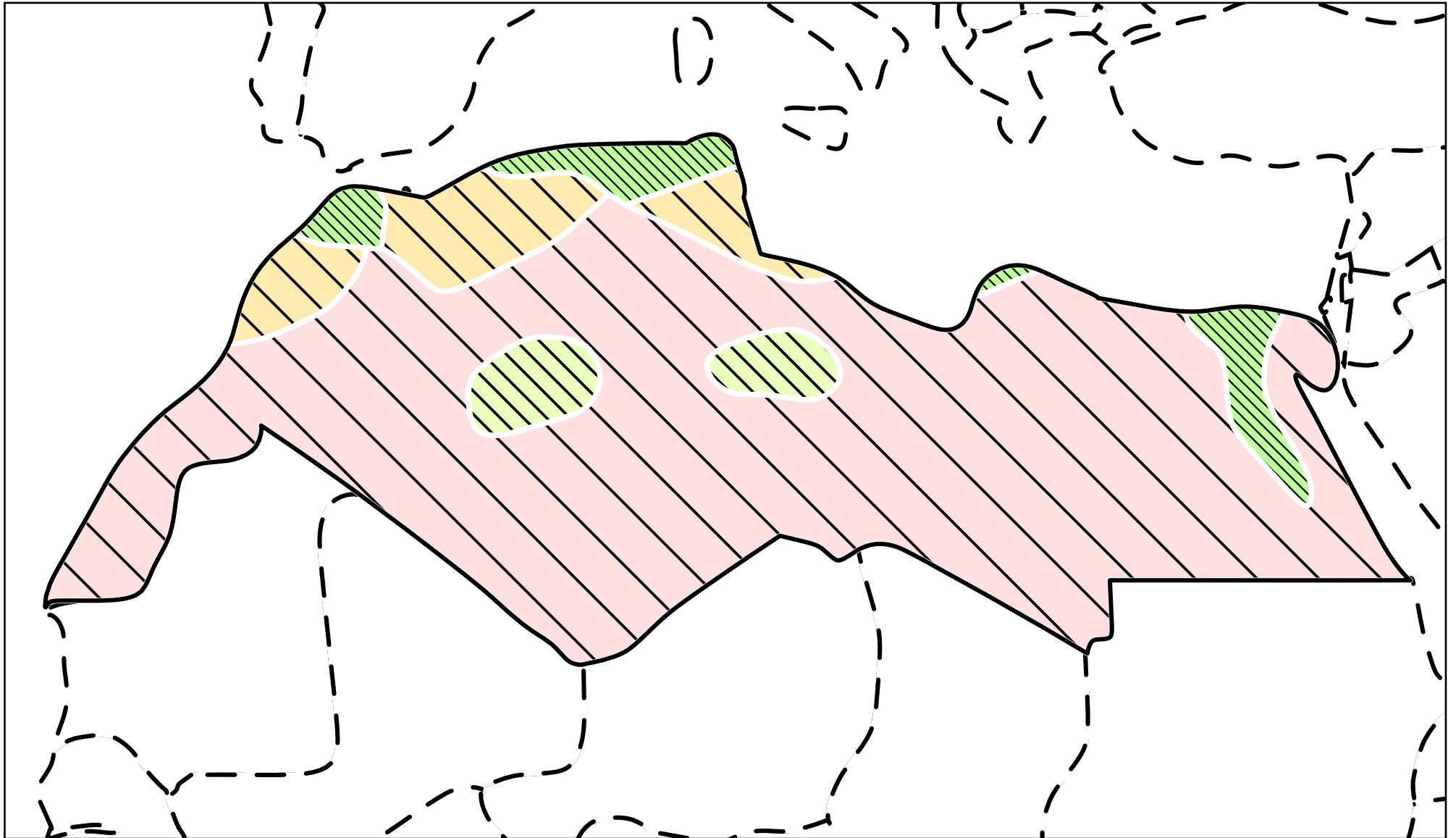


North Africa: Vegetation 2025

1 cm
200 km

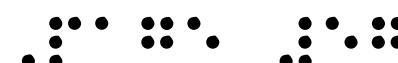
1:20,000,000

Scale represents 200 km





Southern Africa: Political



The following map presents the countries of Southern Africa, with each member country given a solid outline and its own fill. Countries outside the region are delineated using dashed outlines across the top edge, and the dotted area of the page represents water, namely the Atlantic Ocean to the west and the Indian Ocean to the east and south.

Every country here is marked with a lettered circle directly or joined by a short line to the land it points to. Starting at the top left and working down the western side, Angola is identified by circle a, and below it Namibia is marked with circle c. Zambia is indicated by circle b, and below Zambia, in the centre of the map, Botswana is identified by circle d, with Zimbabwe just to its east marked by circle e. Circle g points to Malawi, and Mozambique is marked with circle h. Filling the whole southern end of the region is South Africa, identified by circle f.

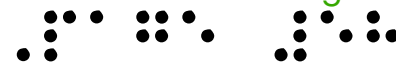
Two very small countries sit at the southern end and are easy to miss, so take care with them. On the eastern edge of South Africa, close to the coast, is Eswatini, marked by circle l, and surrounded by South Africa is Lesotho, identified by circle m. Out in the Indian Ocean lie three island countries of Madagascar, marked with circle j. To its north, circle i points to Comoros, and away to the east, Mauritius is marked by circle k.

This description is also available in the audio track

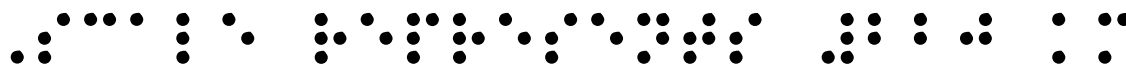




Southern Africa: Political

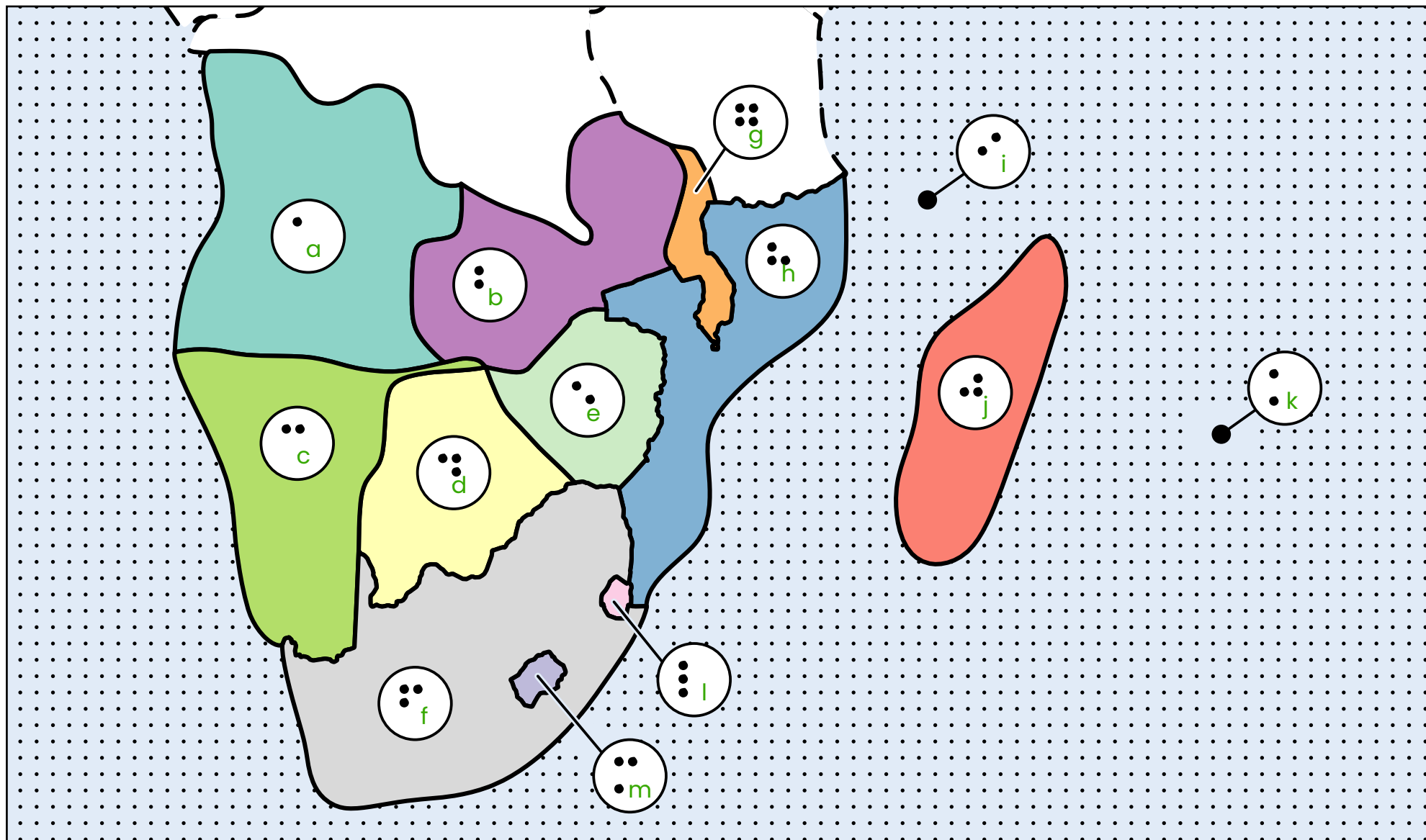


1 cm
220 km



1:22,000,000

Scale represents 220 km



Southern Africa: Political Legend

Page 59

Angola
Zambia

Comoros



Angola

Angola



Comoros

Comoros



Zambia

Zambia



Madagascar

Madagascar



Namibia

Namibia



Mauritius

Mauritius



Botswana

Botswana



Eswatini

Eswatini



Zimbabwe

Zimbabwe



Lesotho

Lesotho



South Africa

South Africa



Malawi

Malawi



Mozambique

Mozambique

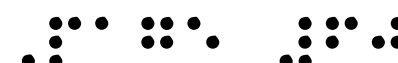
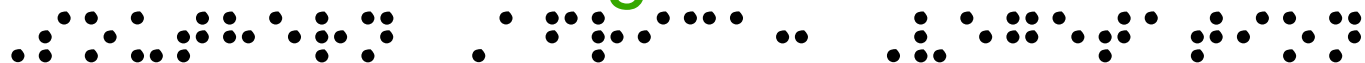


Member Countries

Member Countries



Southern Africa: Vegetation



The following map presents the region of Southern Africa shaded to show how much vegetation covers the land, using the same four textures as the other vegetation maps. Neighbouring countries beyond the region are delineated using dashed outlines across the top, and the dotted area on the left, right and lower sides represents the water of the Atlantic and Indian Oceans meeting around the southern tip. Here the greenest land lies around the outside rather than in the middle. A rim of dense vegetation follows the northern boundary and runs down both coasts, keeping close to the sea all the way around to the southern tip. Inside that rim, filling the interior, is a wide area of low vegetation.

On the western side there is a band of moderate vegetation, set against the southwestern coast, hemmed in between that band and the sea, is a narrow strip of sparse vegetation, the driest ground in the region. The island of Madagascar lies off to the east and follows the same idea in miniature, with low vegetation inside and a green edge of dense vegetation along its coast.

The legend for this map is the same one used for all the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.

This description is also available in the audio track



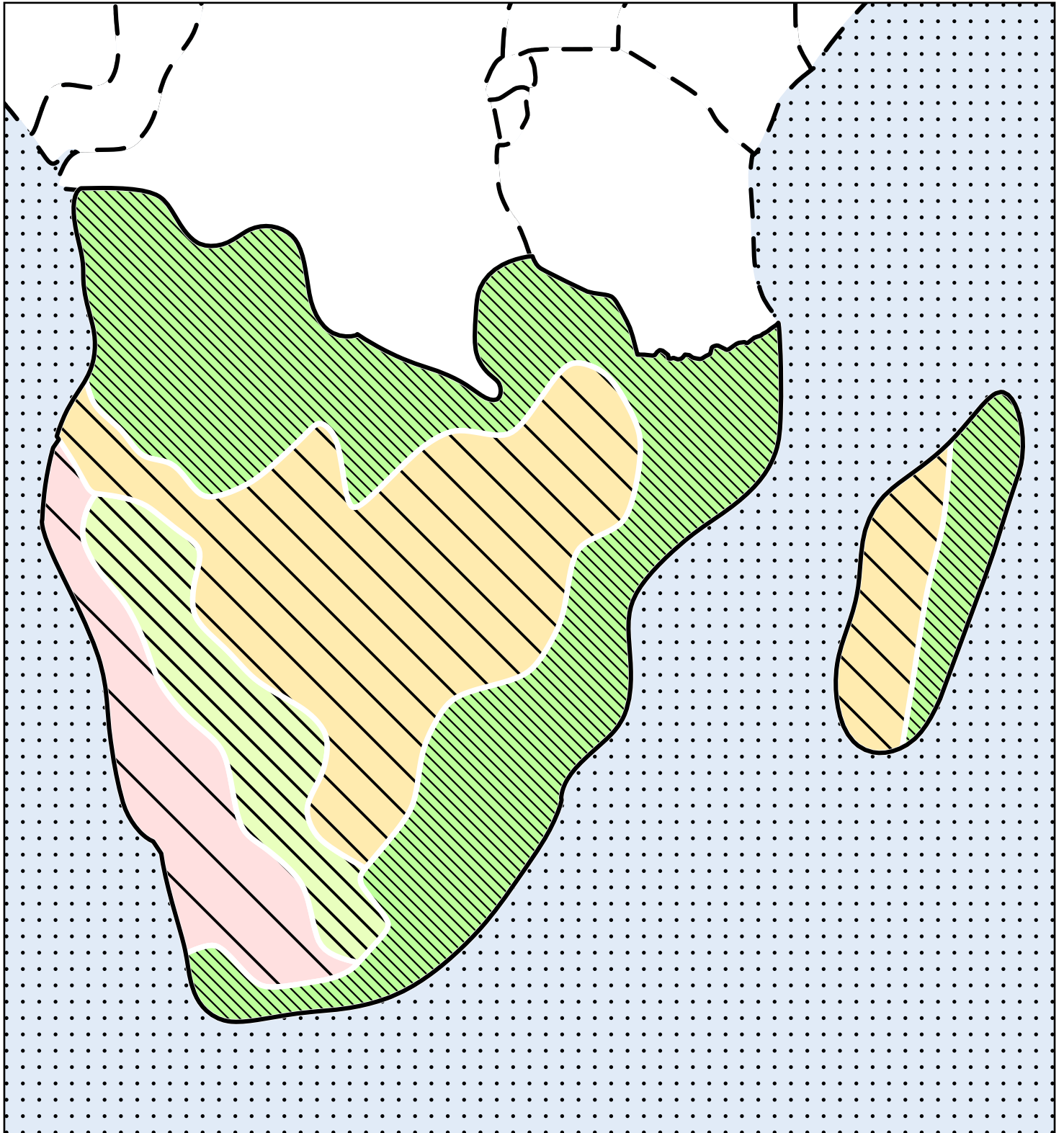
Southern Africa: Vegetation 2025

Page 61

1 cm
200 km

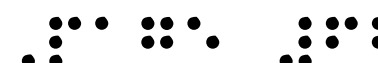
Scale represents 200 km

1:20,000,000





West Africa: Political



The following map presents the countries of West Africa, with each member country given a solid outline and its own fill. Neighbouring countries are delineated using dashed outlines along the top and down the right side, and the dotted area on the left and along the lower edge represents the water of the Atlantic Ocean. Four countries are labelled directly on the map in braille; Mali in the upper middle, Niger, to its east, Chad in the upper right corner, and Nigeria in the lower right. Everything else is marked with a lettered circle or joined by a short line to the country it points to.

Off the west coast, Circle a marks the island group of Cabo Verde. Coming back to the coast and working down the western shore, Mauritania is identified by circle c, the large country in the upper left of the landmass. Below it on the coast is Senegal, marked by circle b, and set inside Senegal as a thin strip is Gambia, identified by circle d. Continuing south, Guinea-Bissau is marked by circle e, then Guinea by circle g, then Sierra Leone by circle f, and Liberia by circle i, the four of them following one another down the curve of the coast. Turning east, Ivory Coast is identified by circle j, Ghana by circle k, then two narrow countries side by side, Togo marked by circle l and Benin by circle m, before the land opens out into Nigeria. Inland, in the middle of the map between Mali and the southern coastal countries, sits Burkina Faso, identified by circle h. Finally, at the lower right of the map, east of Nigeria, Cameroon is marked with circle n.

This description is also available in the audio track

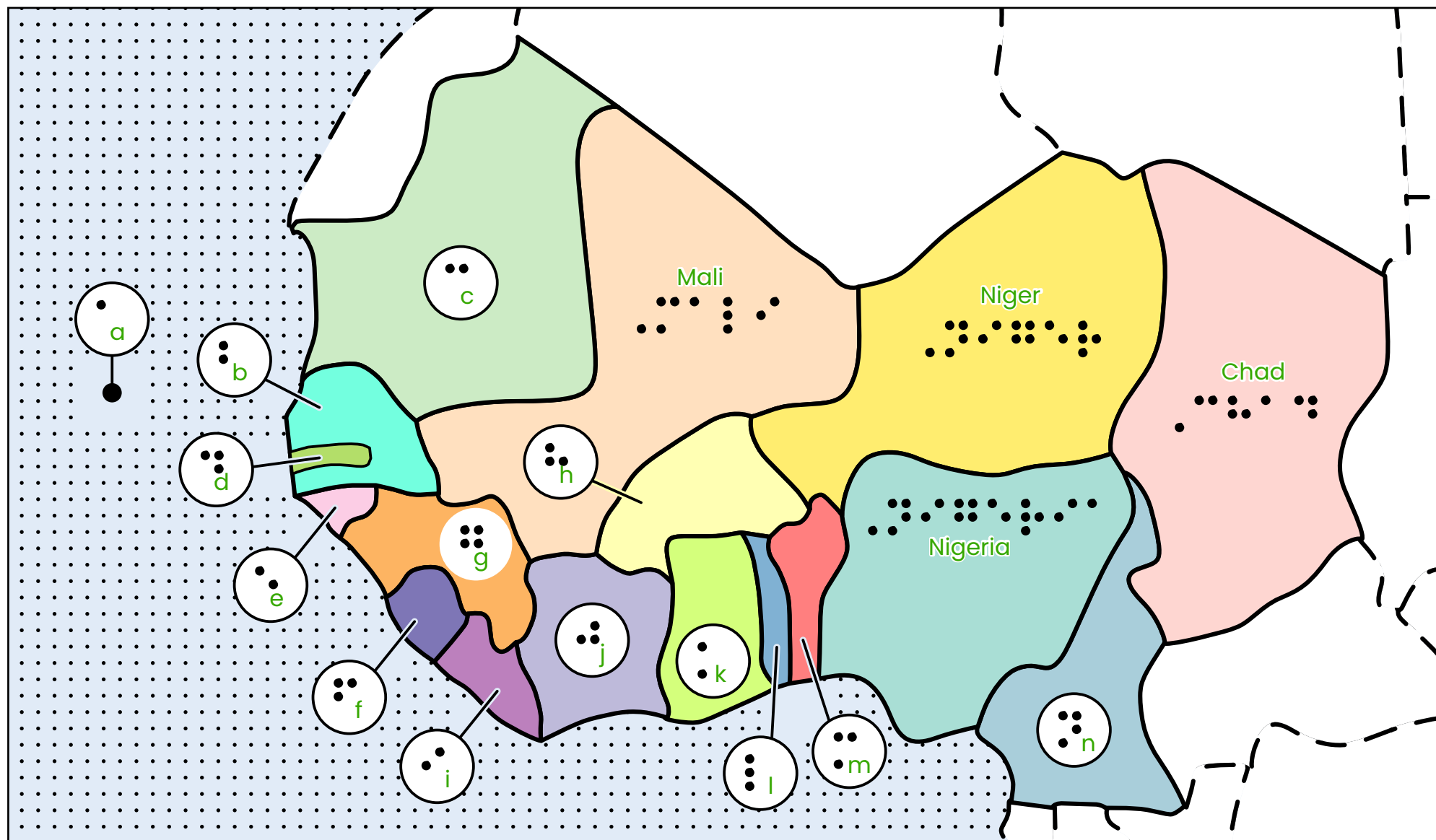


West Africa: Political

1 cm
190 km

1:19,000,000

Scale represents 190 km



West Africa: Political Legend

a

Cabo Verde

h

Burkina Faso

b

Senegal

i

Liberia

c

Mauritania

j

Ivory Coast

d

Gambia

k

Ghana

e

Guinea-Bissau

l

Togo

f

Sierra Leone

m

Benin

g

Guinea

n

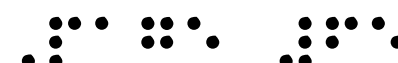
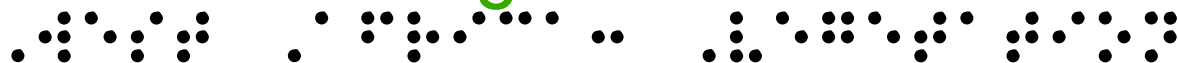
Cameroon



Member Countries



West Africa: Vegetation



The following map presents the region of West Africa shaded to show how vegetation covers the land, using the same four textures as the other vegetation maps. Neighbouring countries are delineated using dashed outlines on the right and along the top, and the dotted area on the left and below represents the water of the Atlantic Ocean, which meets the land on two sides because the region sits on the bulge of the continent. The textures lie in straight bands one above the other, running from side to side across the whole region. Vegetation in the northern part is sparse, where the desert reaches down. Below it comes a band of low vegetation. Below that lies a band of moderate vegetation, and the southern part, nearest the coast, is dense.

Reading this map from north to south, the land changes steadily from sparse, to low, to moderate, to dense. The reason is precipitation. Moist air comes in from the ocean in the south, so the land closest to the sea receives the most rain and grows the thickest cover, while the further north you go the drier it becomes until the desert takes over. Because the change happens in even steps rather than in patches, West Africa is a good place to learn how climate and plant life are linked. The legend for this map is the same one used for all the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.

This description is also available in the audio track

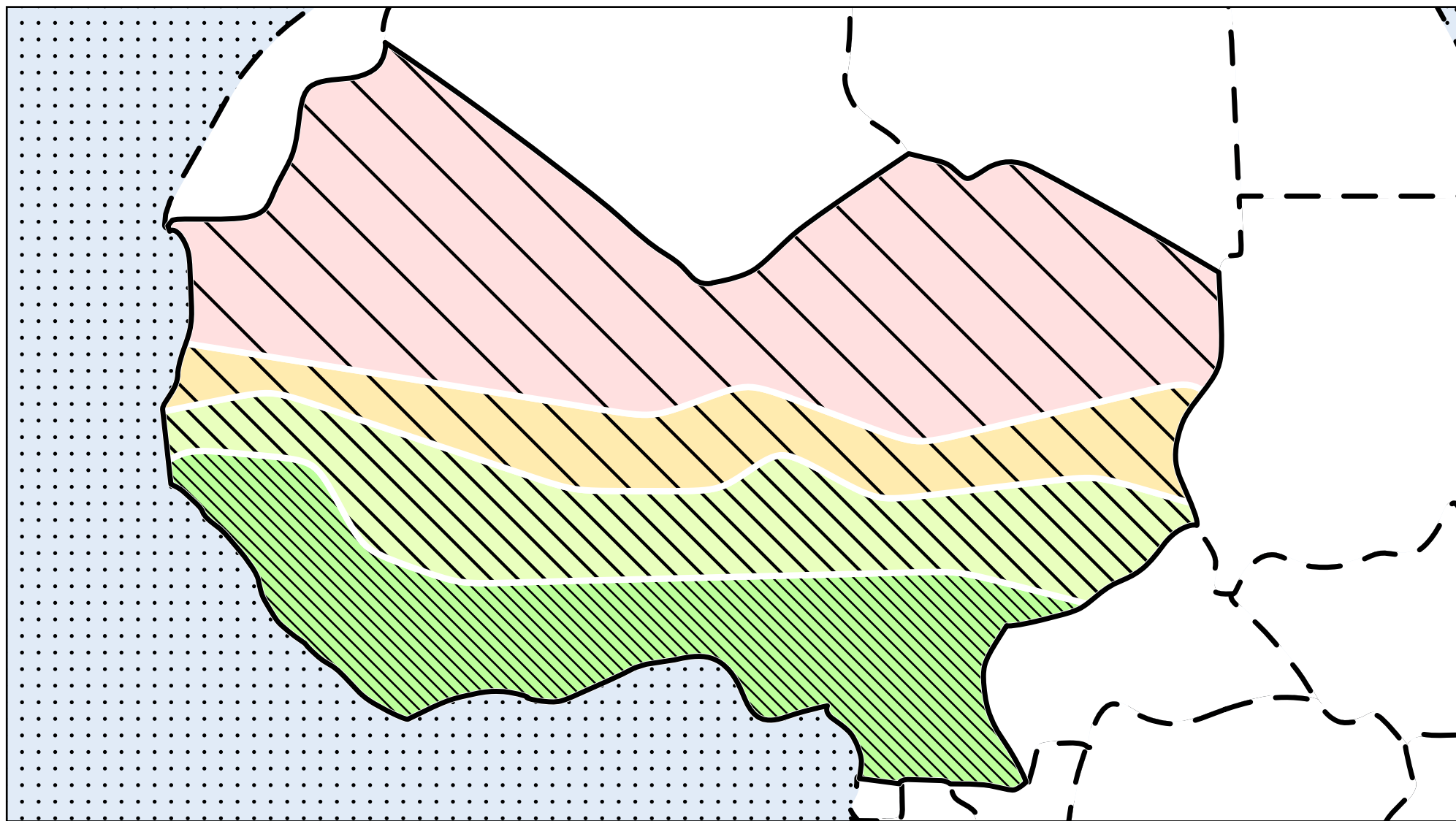


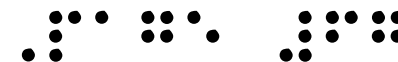


West Africa: Vegetation 2025

1 cm
200 km

1:20,000,000
Scale represents 200 km





This final section is a deep dive into Nigeria, covering early independence, physical and political layout, infrastructure, climate, and international trade trends. The maps track everything from historical administrations and modern geopolitical zones to population data. It also presents the country's core transportation networks, including airports, roads, seaports, and railways, right alongside visuals representing decades of temperature, rainfall, and trade data.

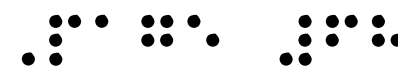
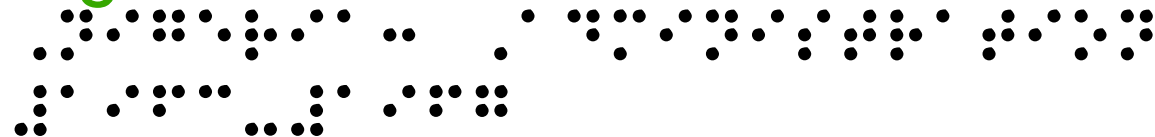
SECTION:

NIGERIA





Nigeria: Administration 1963–1967



The following map presents Nigeria as it was administered between 1963 and 1967, when the country was divided into four regions post independence. Neighbouring countries are delineated using dashed outlines on the left and on the right, and the dotted area along the lower edge represents the water of the Gulf of Guinea. The Northern Region is by far the largest, filled with right-slanted lines and taking up the whole upper part of the country. In the southwest, filled with left-slanted lines, is the Western Region. To its east, filled with horizontal lines, is the Mid-Western Region. East of that again, filled with vertical lines, is the Eastern Region, reaching down to the coast.

Each region carries a lettered circle joined by a short line to the dot that marks its regional capital. In the Northern Region, circle a points to Kaduna. In the Western Region, circle b points to Ibadan. In the Mid-Western Region, circle c points to Benin City, and in the Eastern Region, circle d points to Enugu. Reading the map as a whole, the point to notice is the imbalance: one region held most of the territory while three shared the south, and this uneven arrangement was one of the pressures that led to the country being redrawn into states in 1967. The legend that follows the map page lists the four capitals in order from a to d and shows the four regional textures.

This description is also available in the audio track



Nigeria: Administration 1963-1967

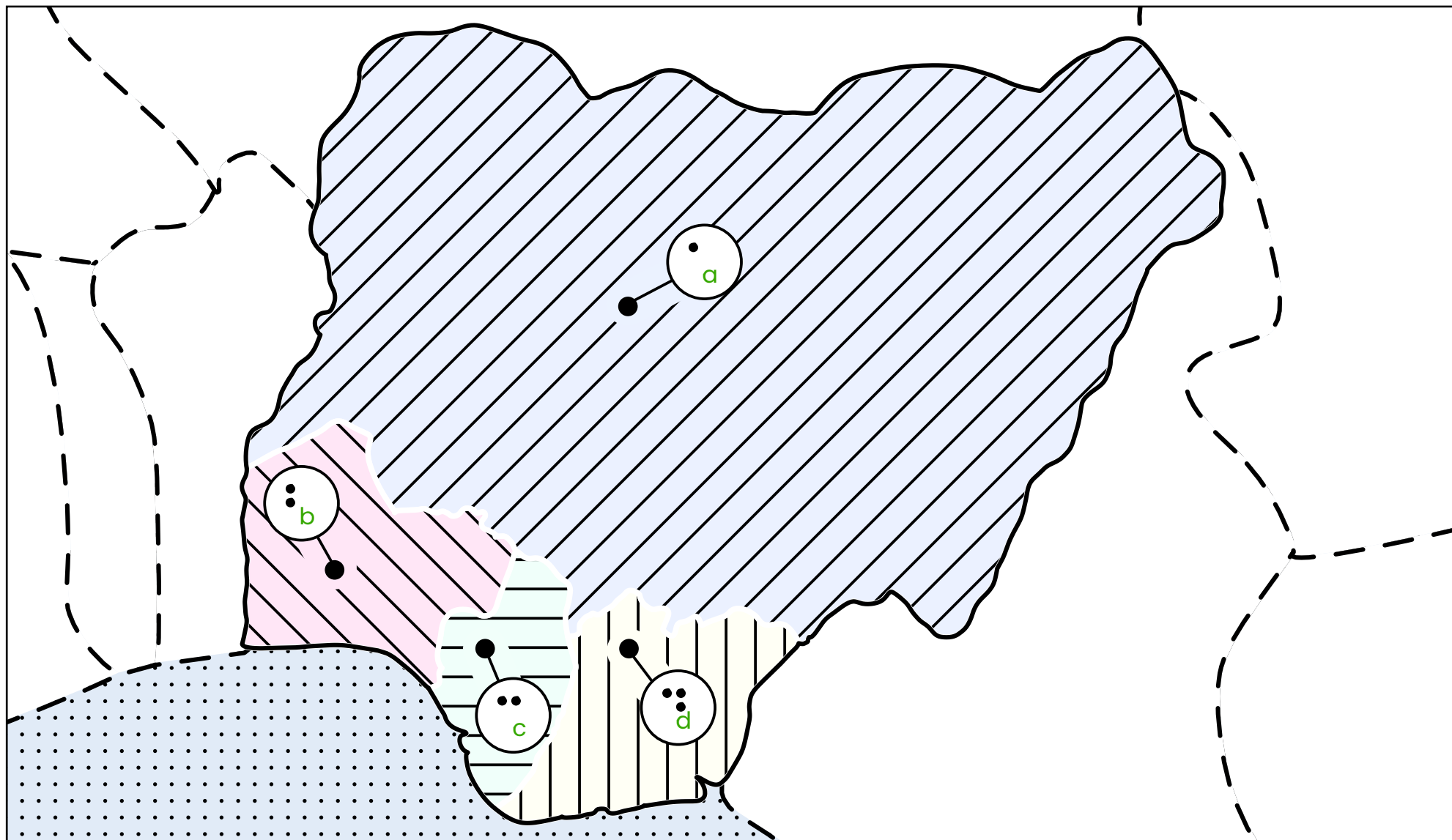
Page 69

Nigeria: Administration 1963-1967

1 cm
75 km

Nigeria: Administration 1963-1967

1:7,500,000
Scale represents 75 km



Nigeria: Administration

1963-1967 Legend

Legend symbols for the 1963-1967 period, including various dot patterns and a small table of symbols.



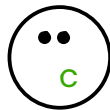
Kaduna

Legend symbols for Kaduna, including a 2x2 grid of dots and a 3x2 grid of dots.



Ibadan

Legend symbols for Ibadan, including a 2x2 grid of dots and a 3x2 grid of dots.



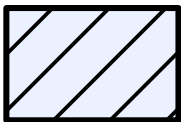
Benin City

Legend symbols for Benin City, including a 2x2 grid of dots and a 3x2 grid of dots.



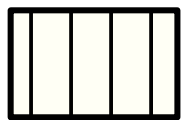
Enugu

Legend symbols for Enugu, including a 2x2 grid of dots and a 3x2 grid of dots.



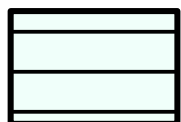
Northern Region

Legend symbols for Northern Region, including a 2x2 grid of dots and a 3x2 grid of dots.



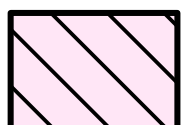
Eastern Region

Legend symbols for Eastern Region, including a 2x2 grid of dots and a 3x2 grid of dots.



Mid-Western Region

Legend symbols for Mid-Western Region, including a 2x2 grid of dots and a 3x2 grid of dots.



Western Region

Legend symbols for Western Region, including a 2x2 grid of dots and a 3x2 grid of dots.

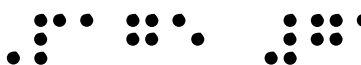


Nigeria: Geopolitical Zones

The following map presents Nigeria's present six geopolitical zones. Each zone is given its own texture and fill. Neighbouring countries are delineated using dashed outlines, and the dotted area represents the water of the Gulf of Guinea.

The North West zone is filled with vertical lines, and to its east, filled with left-slanted lines, is the North East zone. Below them, in the middle of the country, the North Central zone is filled with vertical, dashed lines. Moving down, the South West zone is filled with horizontal lines. Along the southern coast, filled with right-slanted lines, is the South South zone, and set inside it toward the centre, filled with crossed lines that form a grid of small crosses, is the South East zone. The legend that follows the map page lists all six zones with their textures.

Each zone is then presented on its own map, with its states shown separately, on the pages that follow the legend. The North West zone contains Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara. The North East zone contains Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The North Central zone contains Benue, Kogi, Kwara, Nasarawa, Niger, Federal Capital Territory, and Plateau. The South West zone contains Ekiti, Lagos, Ogun, Ondo, Osun and Oyo. The South East zone contains Abia, Anambra, Ebonyi, Enugu and Imo. The South South zone contains Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers. Counted together these make thirty-six states and the Federal Capital Territory.



This description is also available in the audio track





Nigeria: Geopolitical Zones

Nigeria is divided into six geopolitical zones: North West, North Central, North East, South West, South Central, and South East.

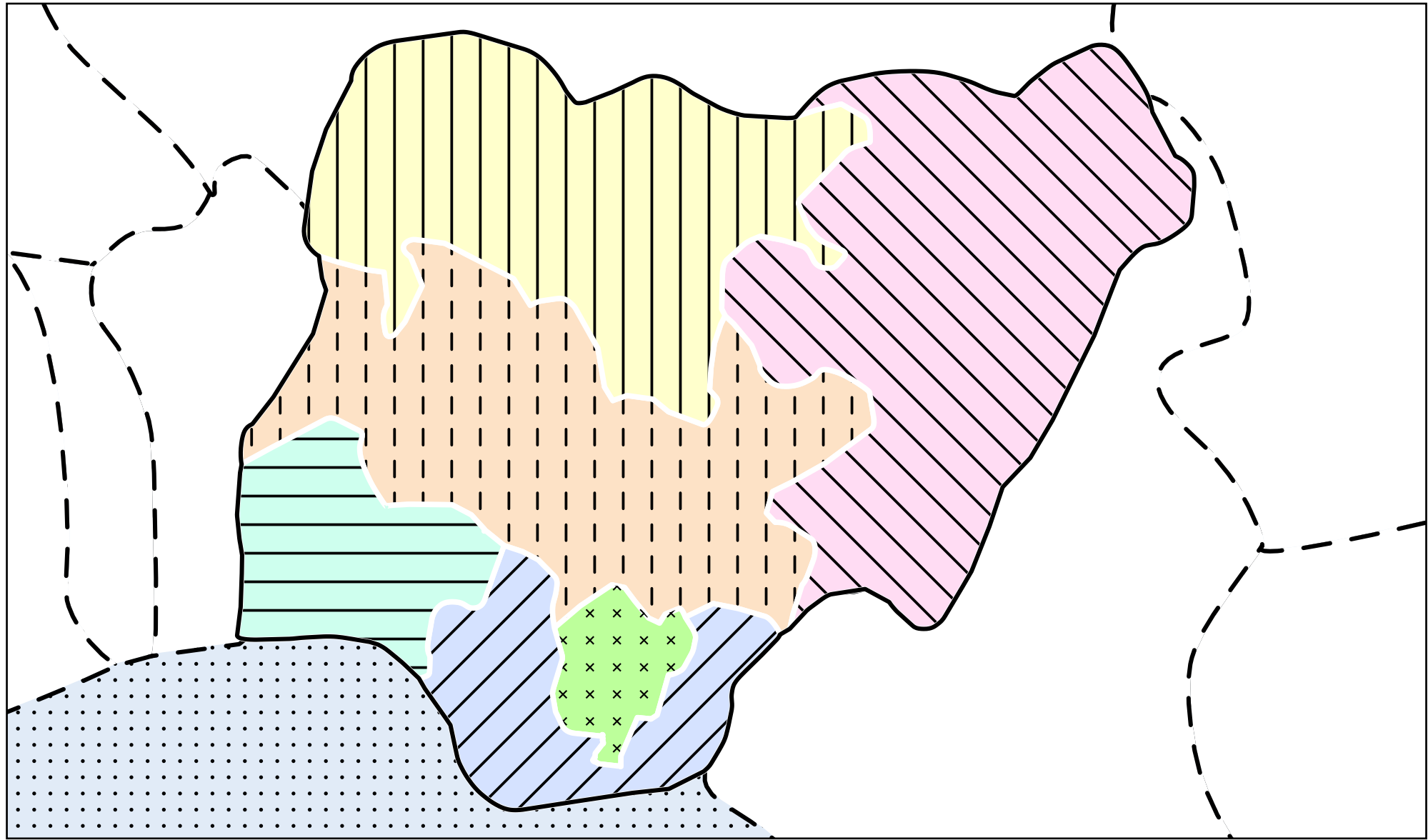
Legend: North West (Yellow), North Central (Orange), North East (Pink), South West (Green), South Central (Blue), South East (Purple).

1 cm
75 km

Scale: 1 cm represents 75 km.

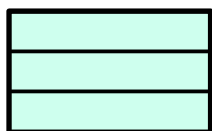
1:7,500,000

Scale represents 75 km

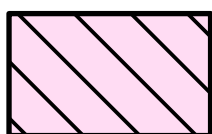


Nigeria: Geopolitical Zones Legend

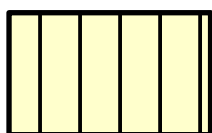
Page 73



South West



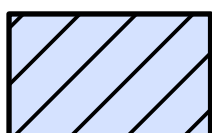
North East



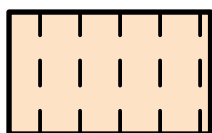
North West



South East



South South



North Central



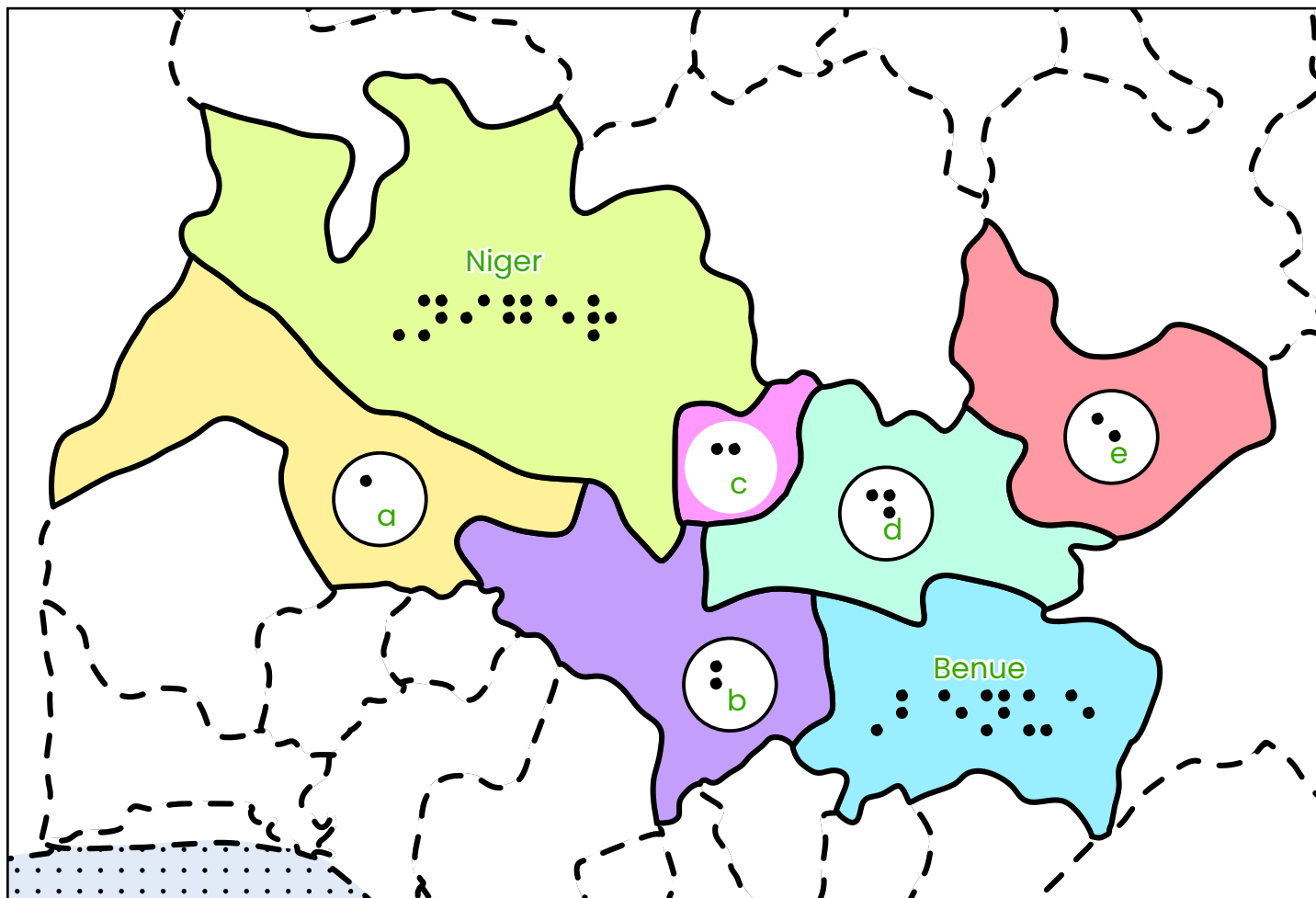
North Central Zone

Page 74

1 cm
50 km

Scale represents 50 km

1:5,000,000



Legend

1 cm
50 km



Kwara

1 cm
50 km



Nasarawa

1 cm
50 km



Kogi

1 cm
50 km



Plateau

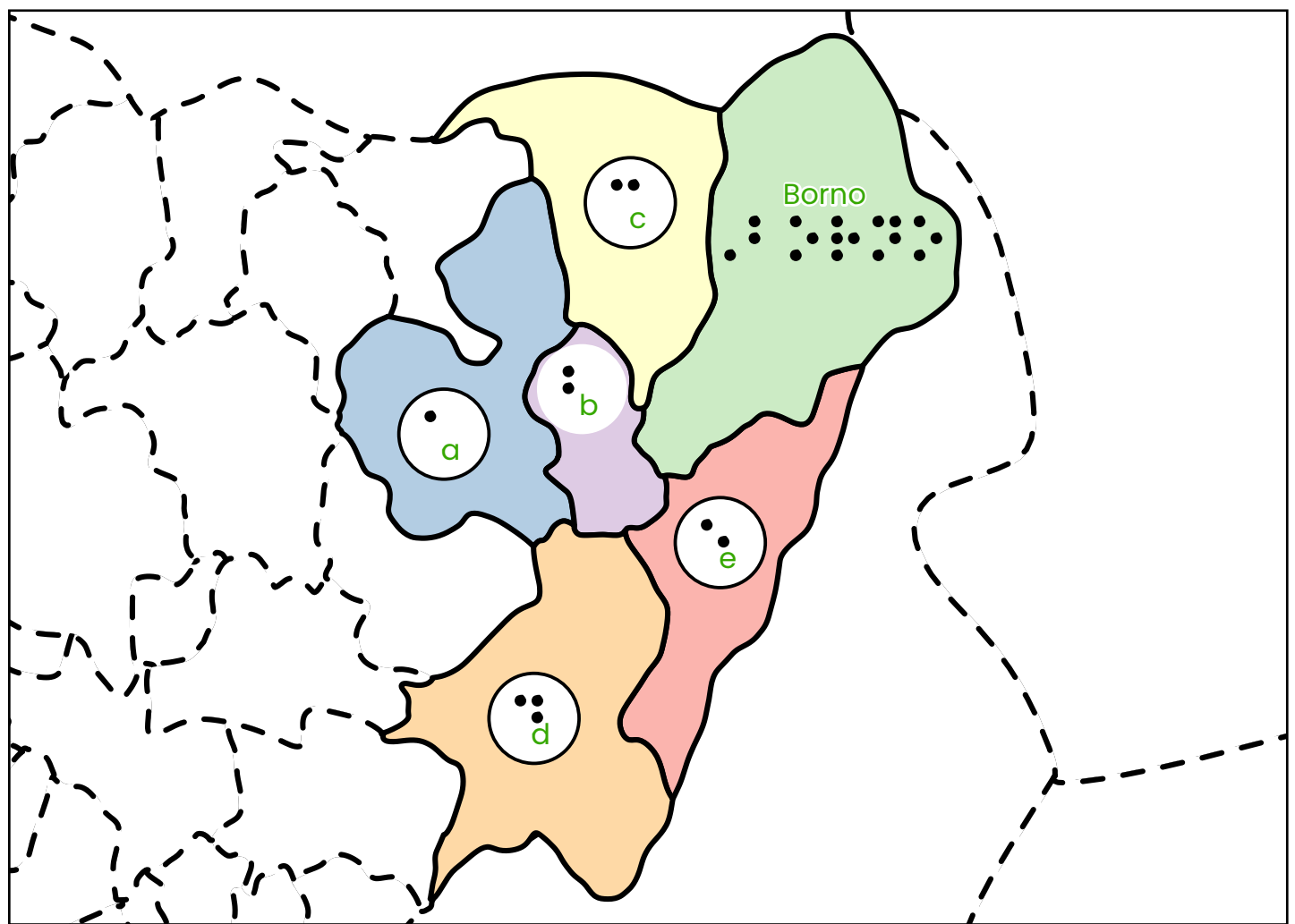
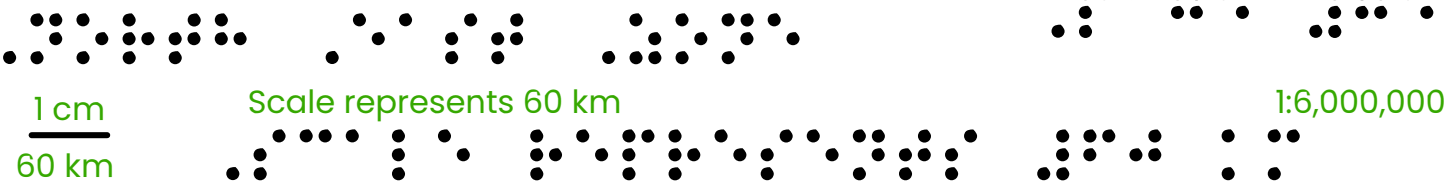
1 cm
50 km



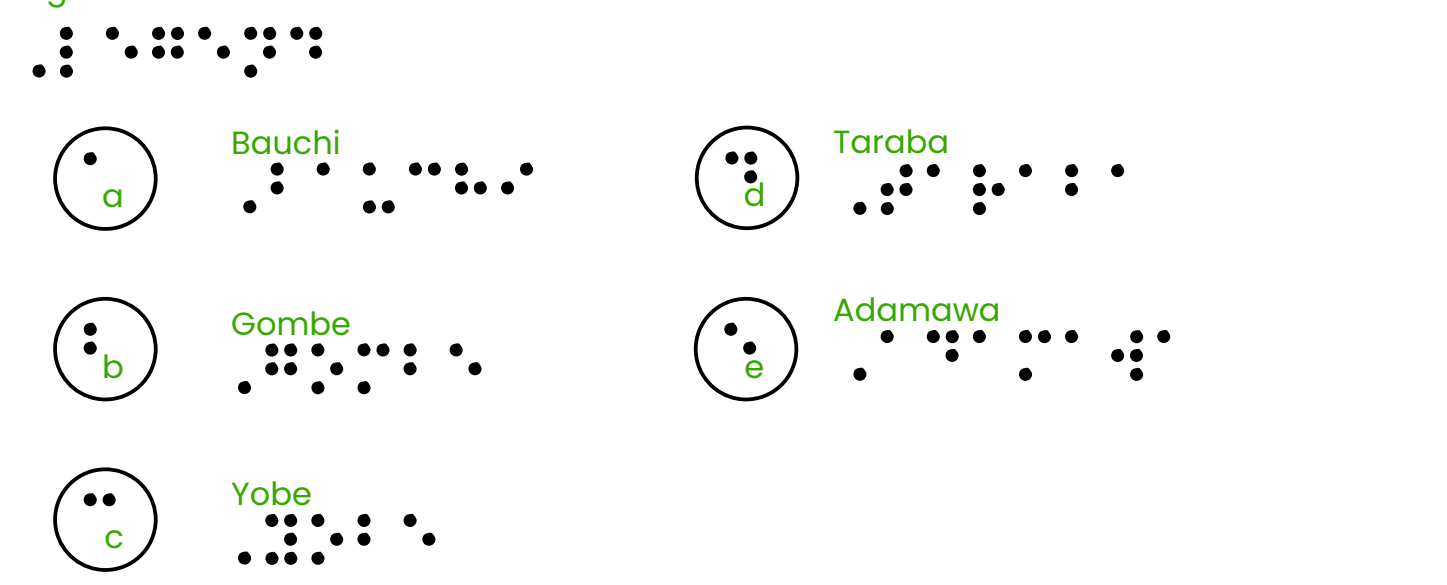
FCT

1 cm
50 km

North East Zone



Legend

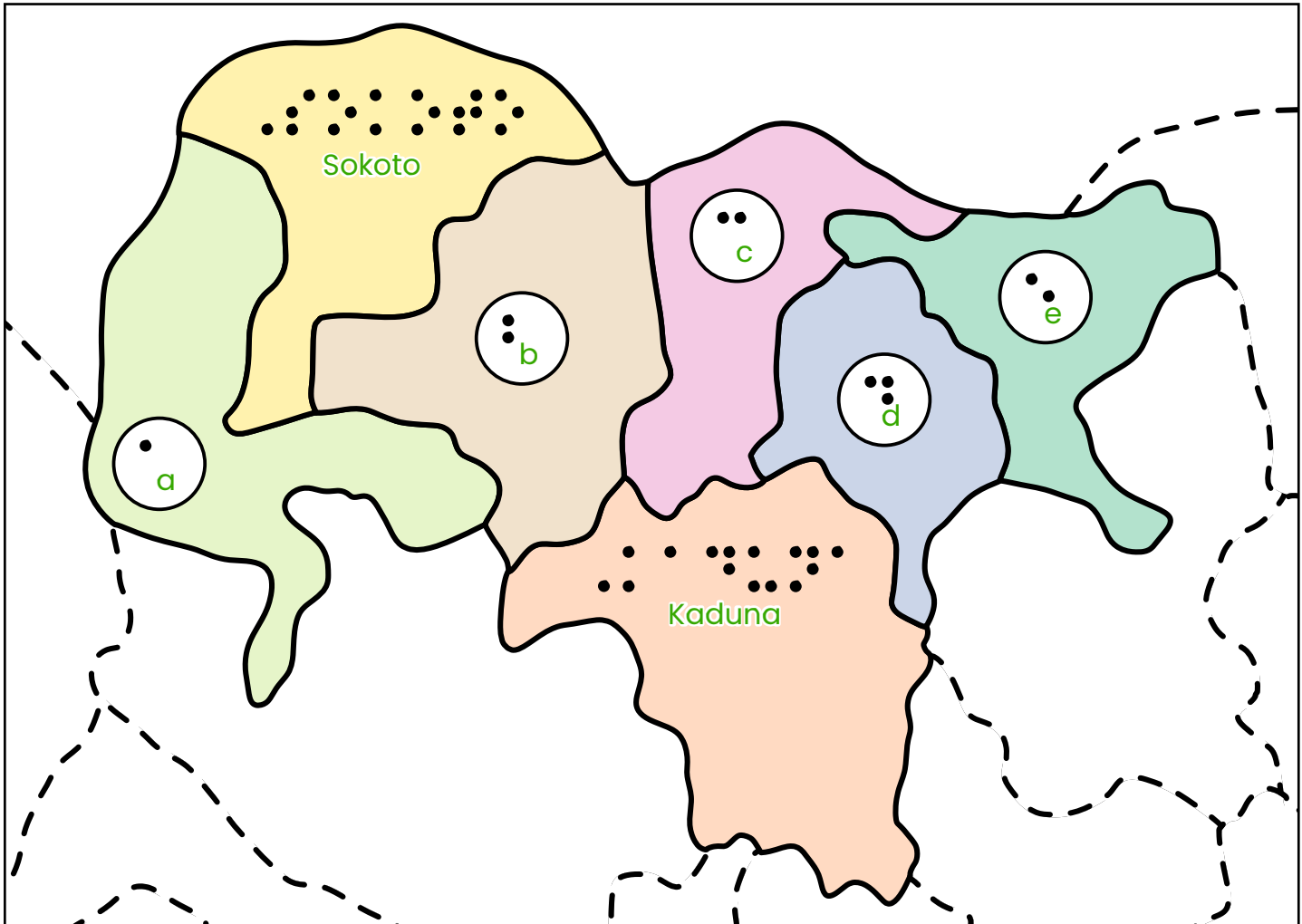


North West Zone

1 cm
40 km

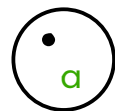
Scale represents 40 km

1:4,000,000



Legend

1 cm
40 km



Kebbi

1 cm
40 km



Kano

1 cm
40 km



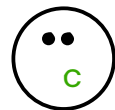
Zamfara

1 cm
40 km



Jigawa

1 cm
40 km



Katsina

1 cm
40 km

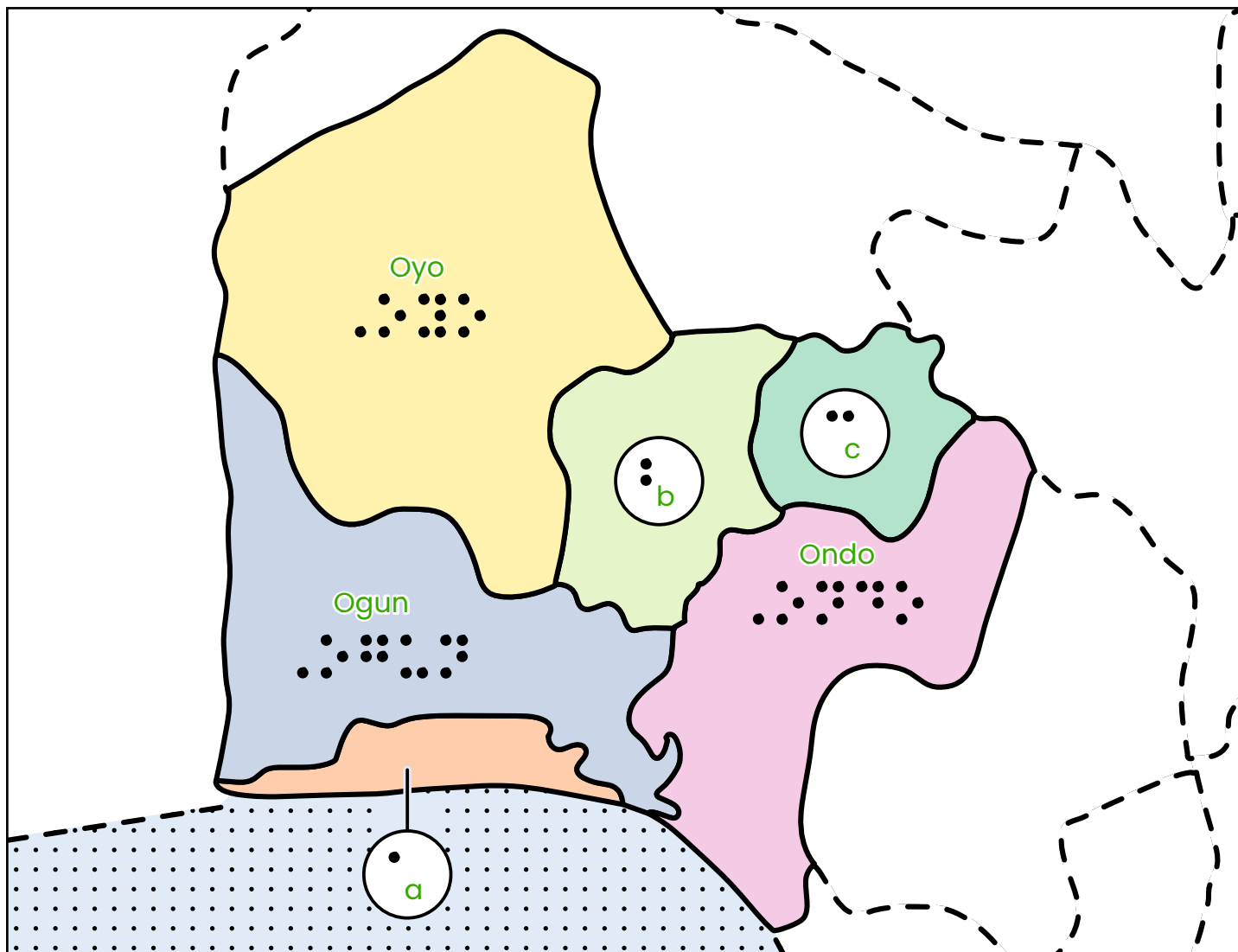
South West Zone

Page 77

1 cm
25 km

Scale represents 25 km

1:2,500,000



Legend

Oyo



Lagos

Osun



Osun

Ekiti



Ekiti

Ondo

South East Zone

Braille representation of the title 'South East Zone'.

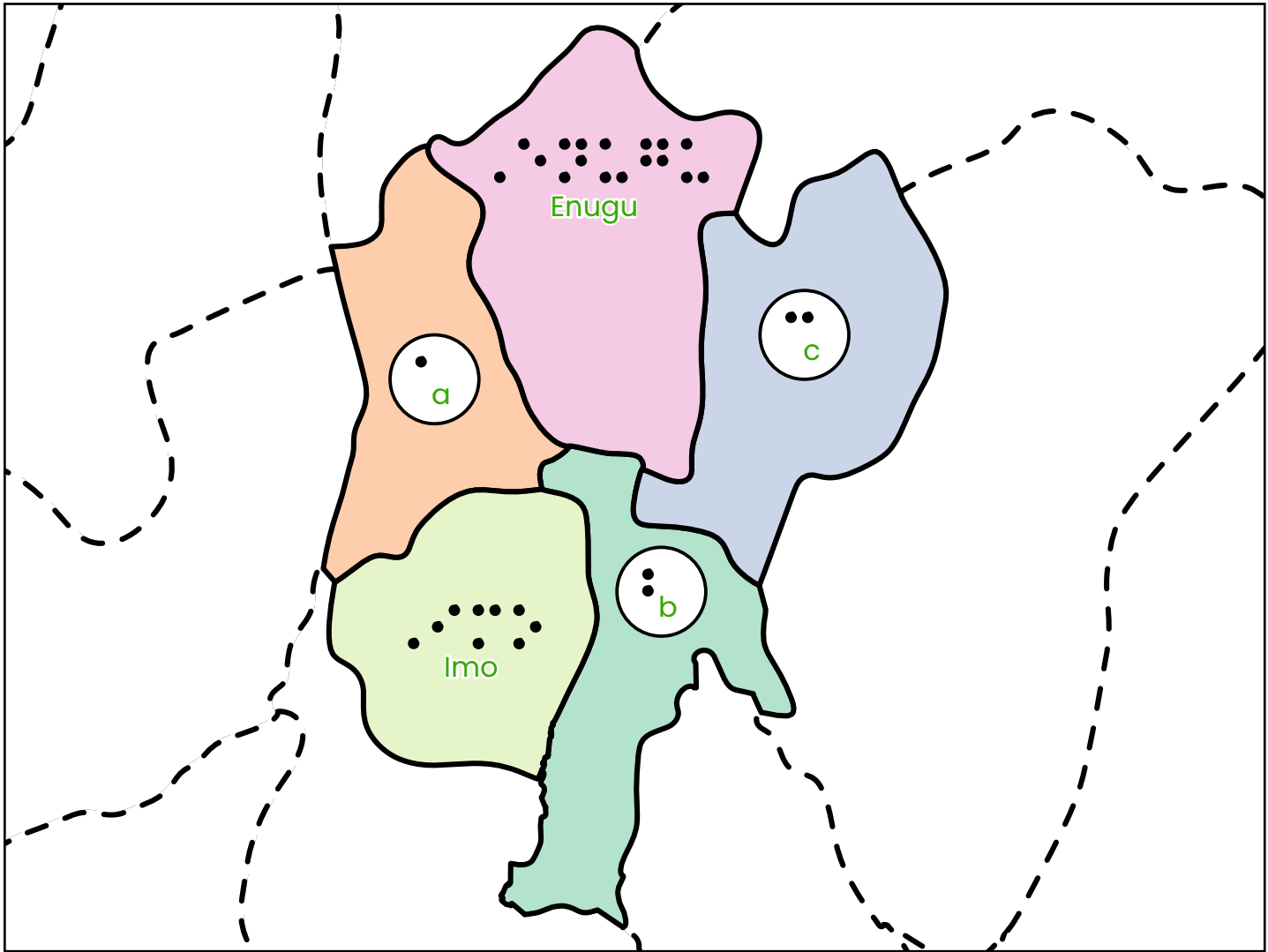
Braille representation of the page number '78'.

1 cm
18 km

Scale represents 18 km

1:1,800,000

Braille representation of the scale information.



Legend

Braille representation of the legend title.



Anambra

Braille representation of the state name 'Anambra'.



Ebonyi

Braille representation of the state name 'Ebonyi'.



Abia

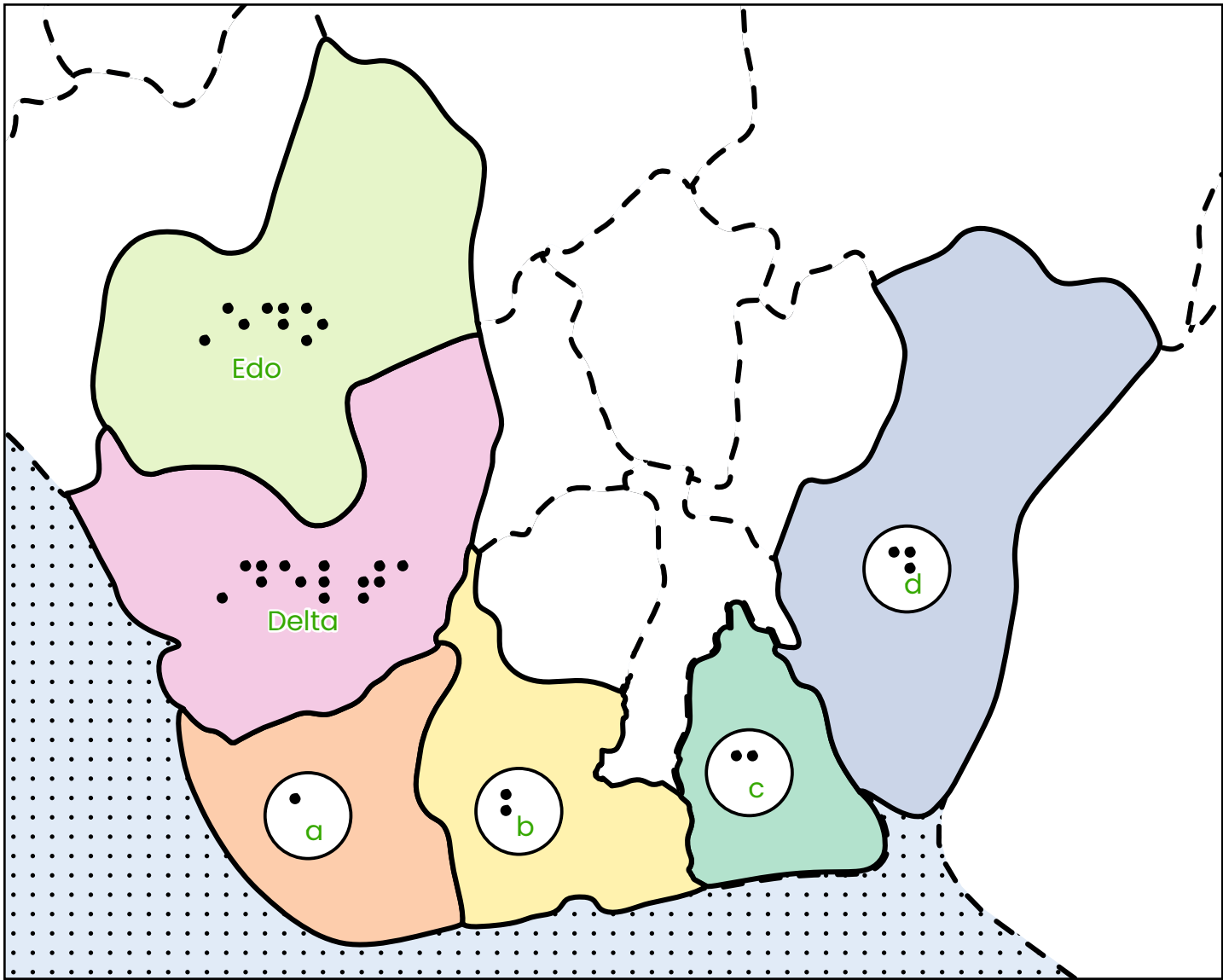
Braille representation of the state name 'Abia'.

South South Zone

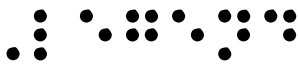
1 cm
25 km

Scale represents 25 km

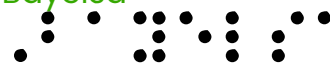
1:2,500,000



Legend



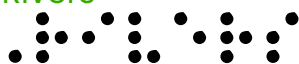
Bayelsa



Akwa Ibom



Rivers

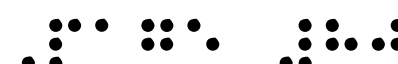
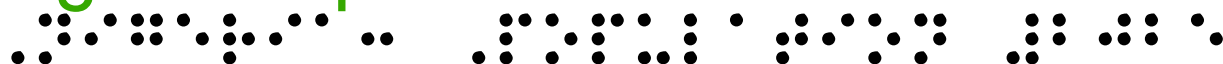


Cross River





Nigeria: Population 2025



The following map presents the population density of Nigeria in 2025 filled with five textures that stand for how many persons live in each square kilometre. The loosest texture means one hundred persons or fewer, and the textures grow heavier and closer together and the densest texture represents a thousand persons or more. Breakpoints inside the country outline mark the state boundaries, so you can feel where one state ends and the next begins. Neighbouring countries are shown with dashed outlines, and the dotted area below is the Gulf of Guinea.

The chart that follows is a population pyramid. A vertical line is at the centre, with bars to the left counting males and bars to the right counting females, in millions of persons. On the left of the page, five age groups are stacked upward from zero to fourteen at the base, then fifteen to twenty-nine, thirty to forty-four, forty-five to fifty-nine, and sixty and over at the top. The bars are widest at the bottom and shorten with every step up, giving the pyramid shape. At the base are forty-eight million males and forty-six million females, then thirty-four and thirty-three million, then twenty and nineteen million, then eleven million of each, and at the top six million of each, making a total of two hundred and thirty-four million people. Together the two pages show that Nigeria is both unevenly settled and has very young people.





Nigeria: Population Density 2025

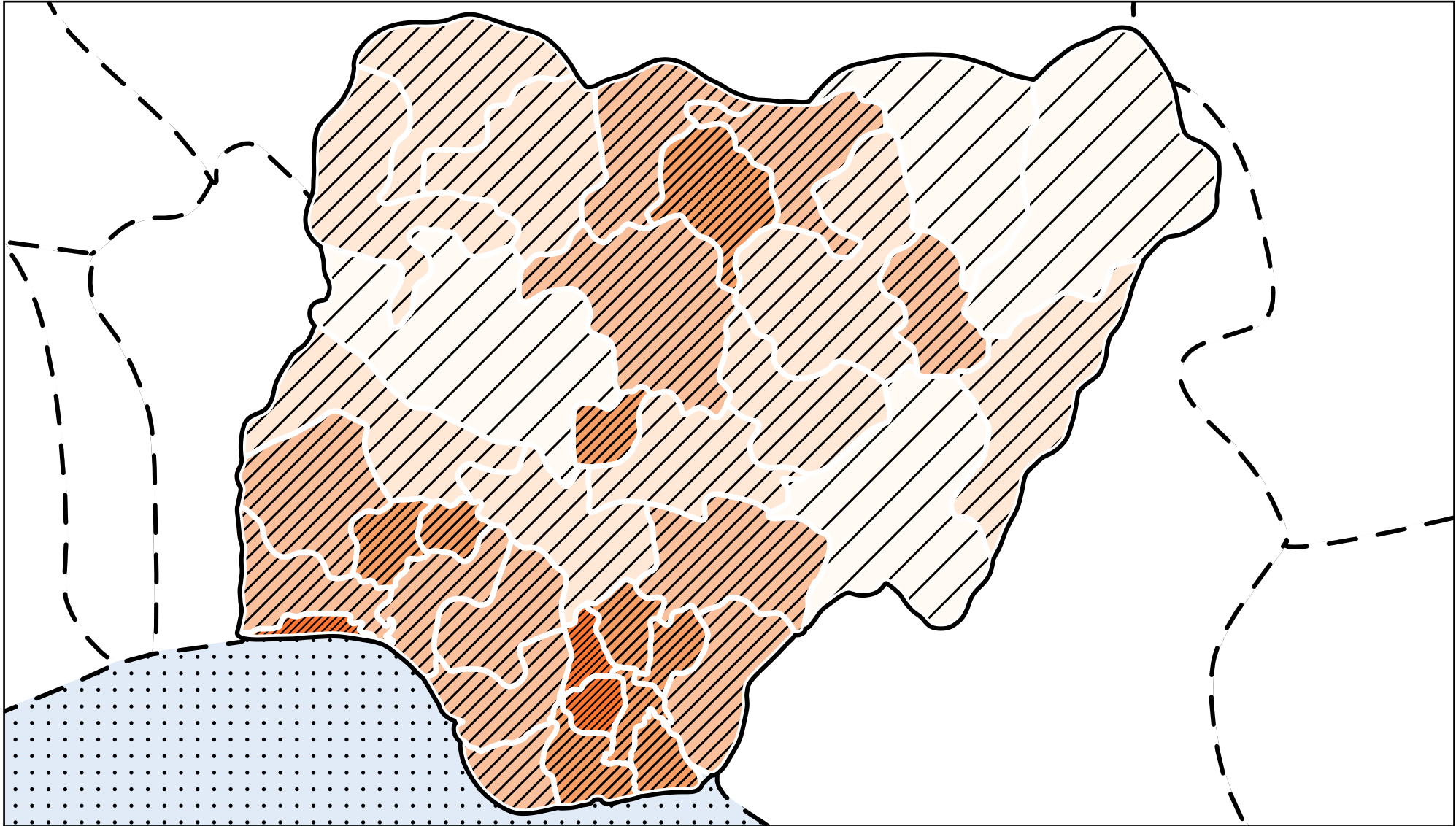


Population Density 2025

1 cm
75 km

Scale represents 75 km

1:7,500,000
Scale represents 75 km

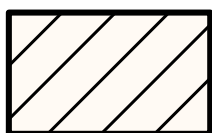


Nigeria: Population Density 2025 Legend

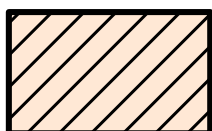
Page 82

(Number of persons per sq km)

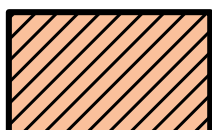
min: 62



100 or less



100-200



200-500



500-1,000



1,000 or more

max: 4,176



Nigeria: Population 2025 in Million Persons

Population 2025 in Million Persons

Ages
60 plus

45-59

30-44

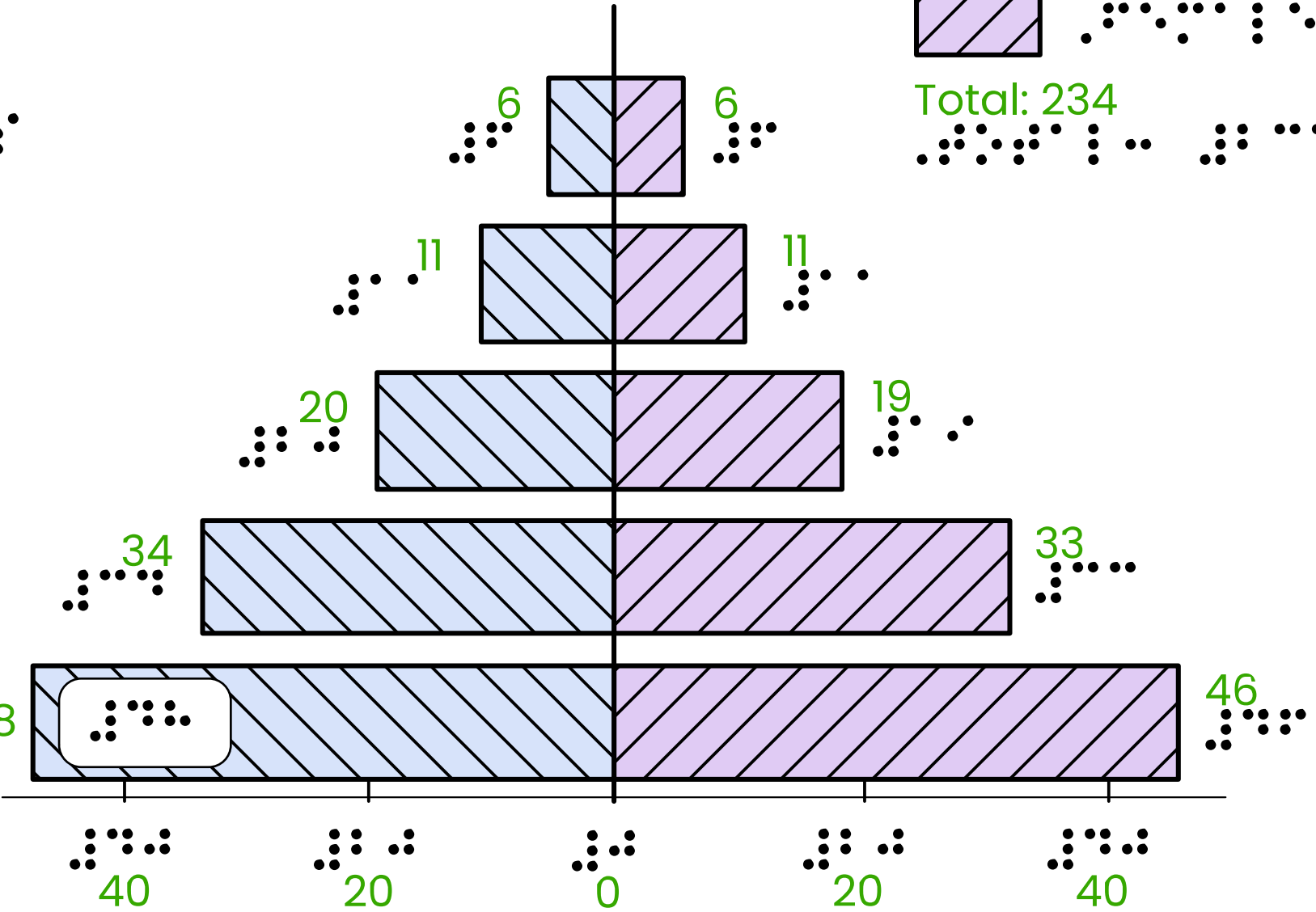
15-29

0-14

Male

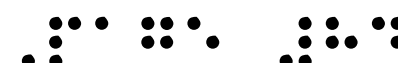
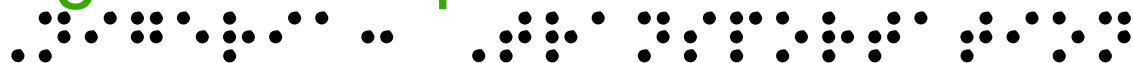
Female

Total: 234





Nigeria: Transportation



The following maps present the transport system of Nigeria across four pages, covering airports, expressways, seaports and railways. On the airport map the country is filled smoothly, and the airports are shown as small dots of two kinds: a hollow dot marks a domestic airport, and a solid filled dot marks an international one. The expressway map that follows shows the road network as solid lines running across a plain fill. The lines gather into a dense web in the south and southwest, where the towns lie close together, and then reach out as longer single routes toward the north and northeast, crossing the wide, thinly settled land. Tracing any northern route eventually joins the crowded southern web, which shows how goods and people move between the two halves of the country.

The seaport map covers only the southern coast, drawn at a closer scale so the shoreline fills the page, with the land above and the dotted water of the Gulf of Guinea below. Seven ports are marked by lettered circles explained in the map's legend page. Notice that every port lies on the southern coast, since the north has no sea of its own. The railway map on the final page shows the lines as broken, dotted tracks. They form a much thinner network than the roads, with one line running from the southwest up through the middle of the country to the north, another from the southeast joining it, and a branch reaching to the northeast.

This description is also available in the audio track



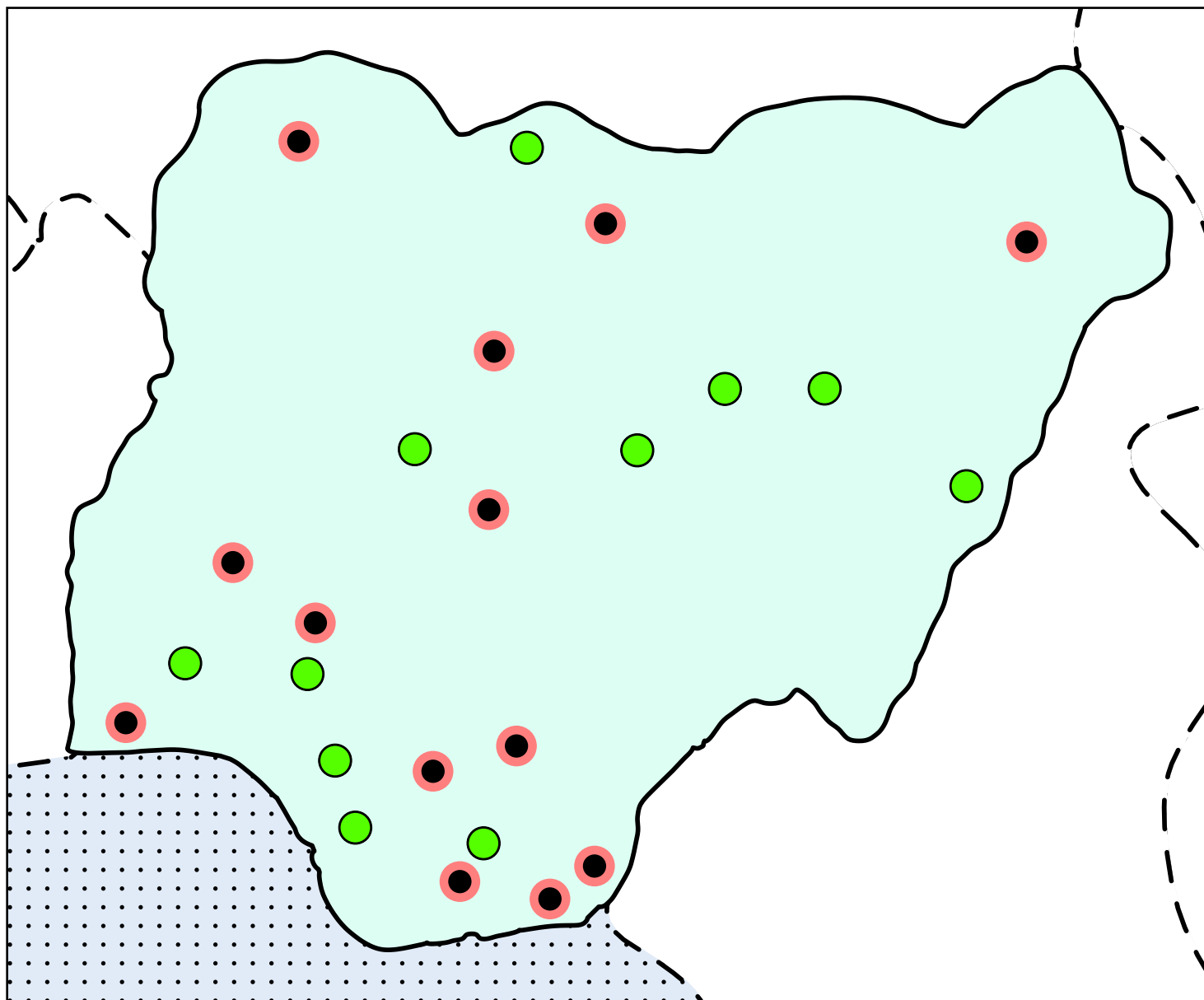
Nigeria: Airports

Page 85

1 cm
75 km

Scale represents 75 km

1:7,500,000



Legend



International



Domestic

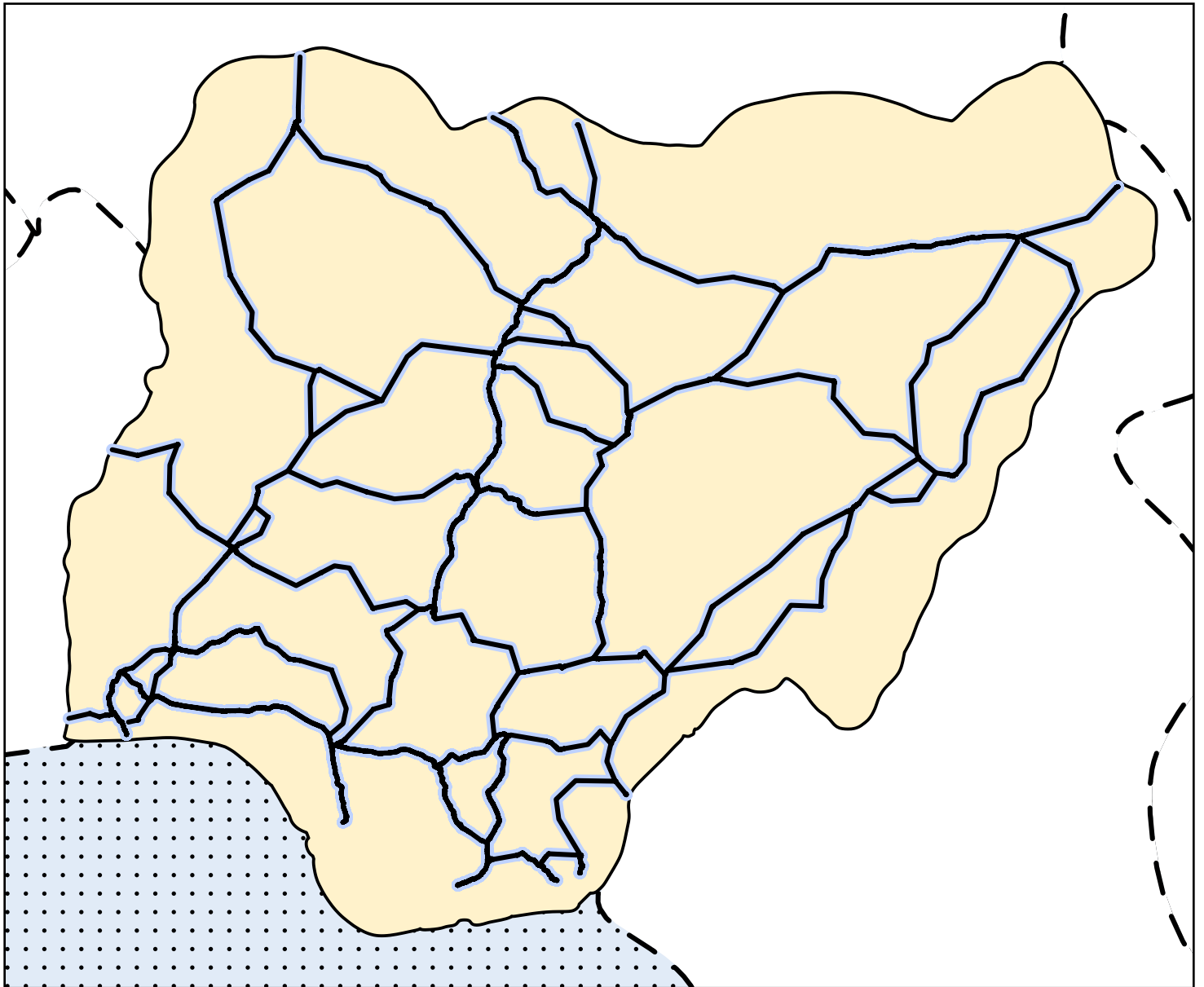
Nigeria: Expressways

Page 86

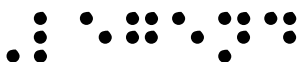
1 cm
75 km

Scale represents 75 km

1:7,500,000



Legend



Expressway



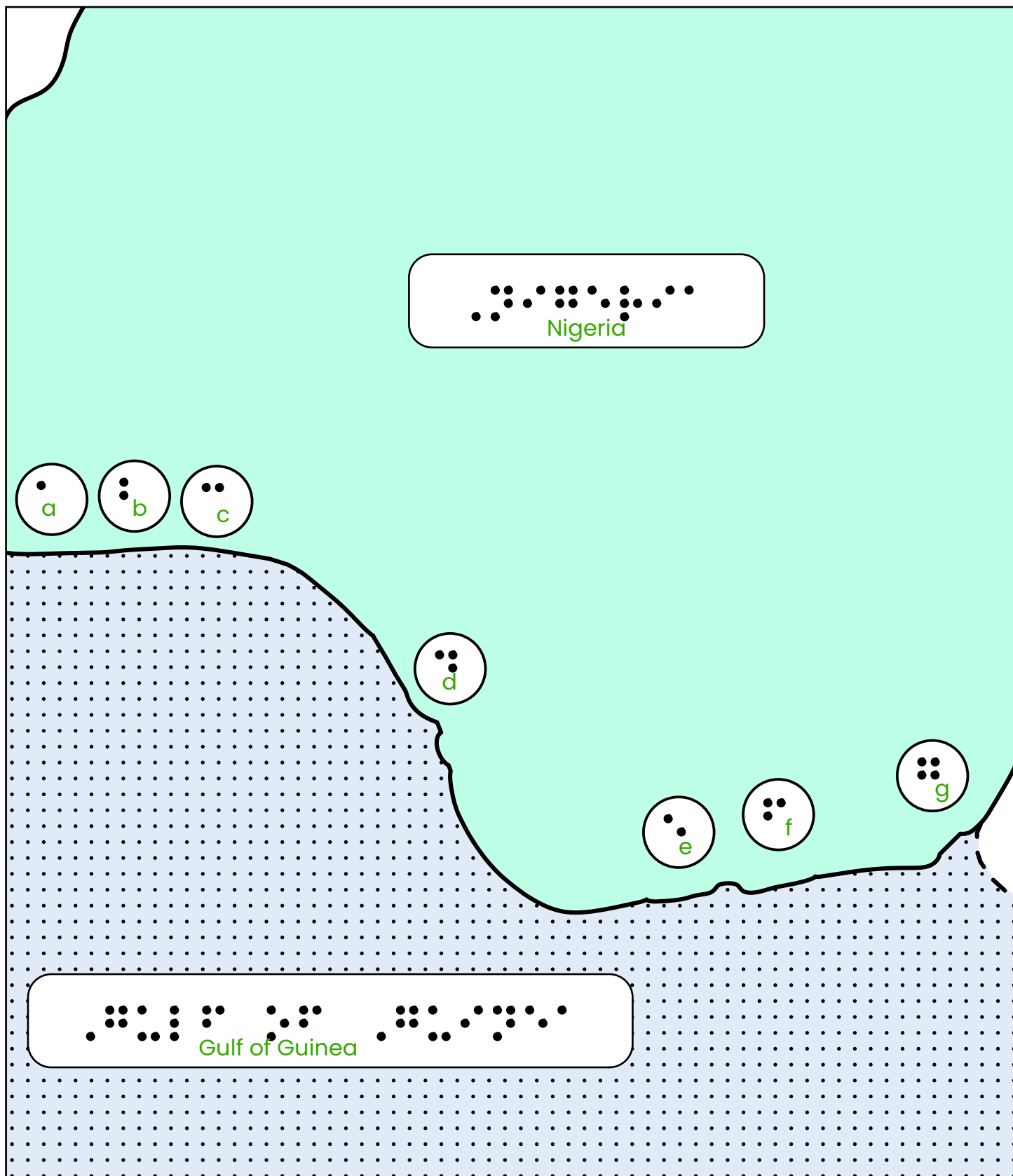
Nigeria: Seaports

Page 87

1 cm
35 km

Scale represents 35 km

1:3,500,000

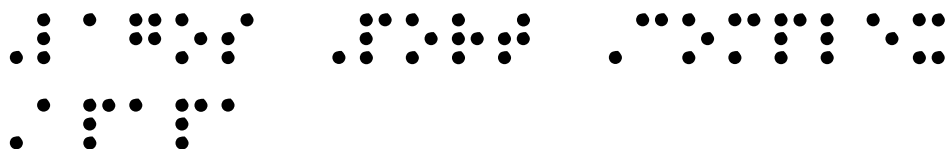


Nigeria: Seaports Legend



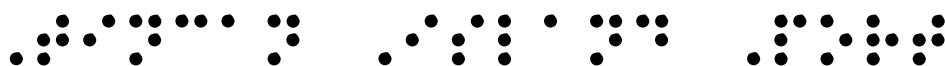
a

Lagos Port Complex Apapa



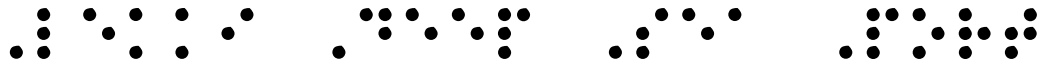
b

Tincan Island Port



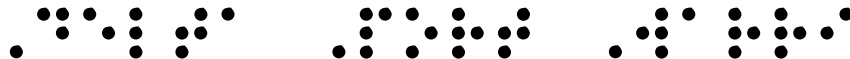
c

Lekki Deep Sea Port



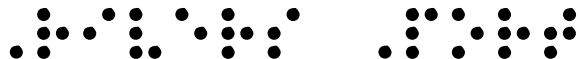
d

Delta Port Warri



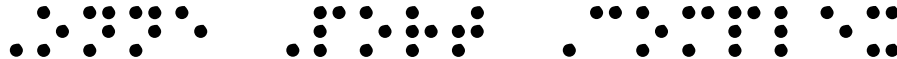
e

Rivers Port



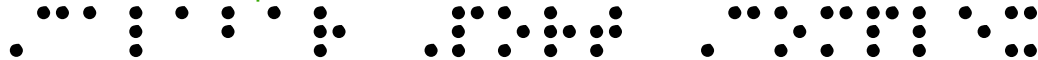
f

Onne Port Complex



g

Calabar Port Complex



Nigeria: Railways

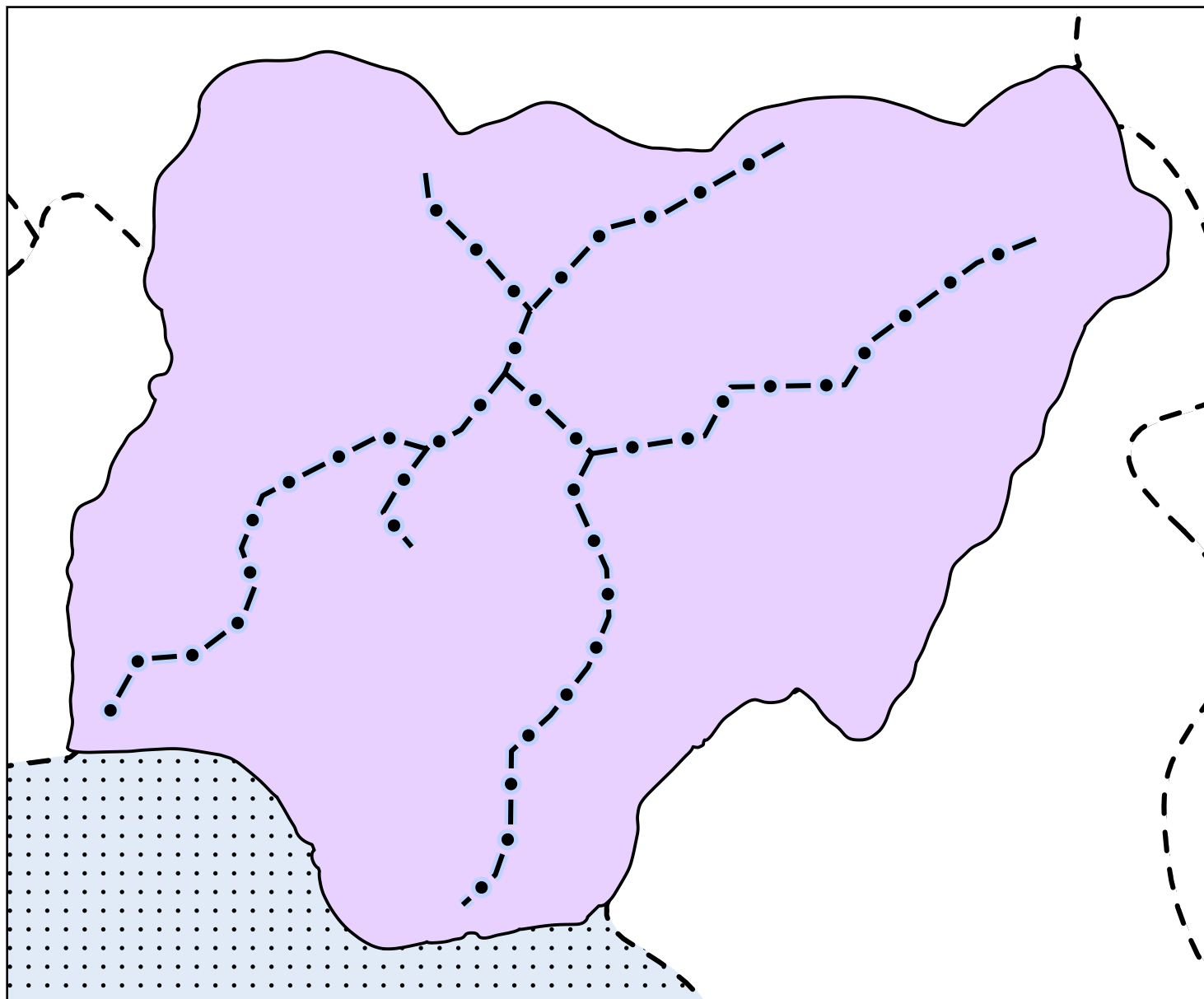
Page 89

1 cm

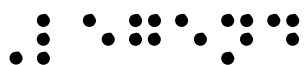
75 km

Scale represents 75 km

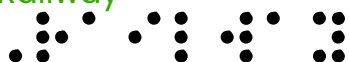
1:7,500,000



Legend

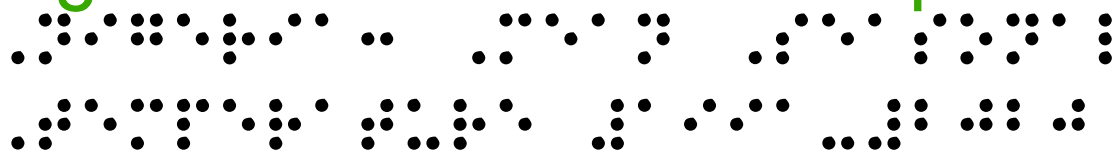


Railway





Nigeria: Mean Seasonal Temperature 1991–2020



The following map presents the mean seasonal temperature of Nigeria measured over the years 1991 to 2020, taking the months of February to April, which are the peak of the heat period in Nigeria. The figures are adapted from the archive of the Nigerian Meteorological Agency. The most tightly packed texture means more than twenty-eight degrees, the hottest band. Next comes twenty-six to twenty-eight degrees, then twenty-three to twenty-five degrees, and the most widely spaced texture means less than twenty-three degrees, the coolest band of all. Breakpoints inside the country separate one temperature band from the next, so you can feel exactly where the change happens.

Across the top of the country lies the hottest region; below it, filling much of the middle and reaching east toward the border, is the band of twenty-six to twenty-eight degrees, which covers more area and it also forms a ring around a cooler area in the centre of the country. The coolest spots include the Jos Plateau in the middle of the country and the Mambilla Plateau in the east, where height above sea level brings the temperature down. The lesson to take from this map is that temperature in Nigeria falls as you move south away from the desert, but also falls sharply wherever the land rises, which is why the coolest ground is not at the coast but in the hills.

This
description is
also available
in the audio
track



Nigeria: Mean Seasonal Temperature 1991-2020

Page 91

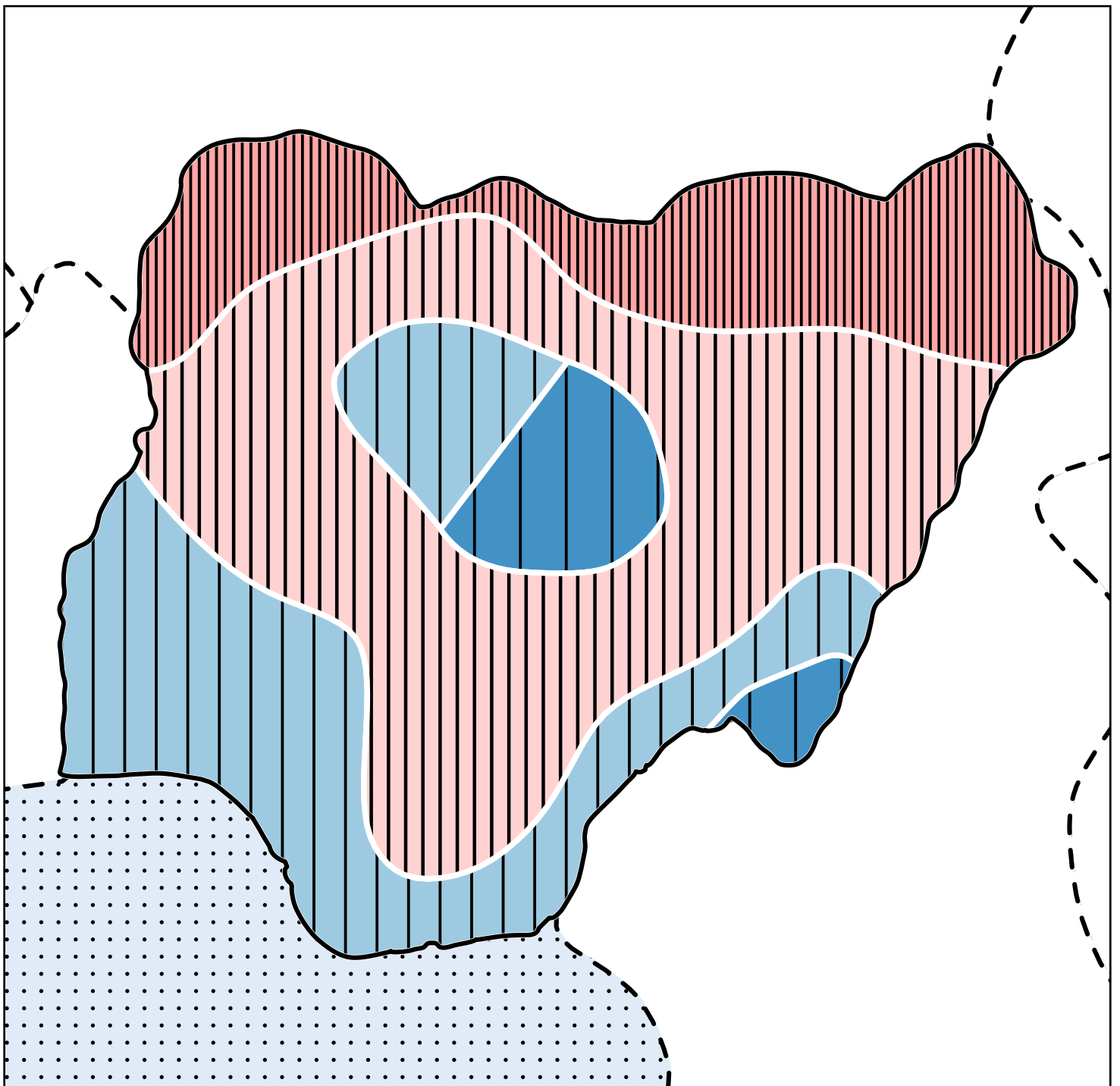
Mean Seasonal Temperature 1991-2020

1 cm
75 km

Scale represents 75 km

1:7,500,000

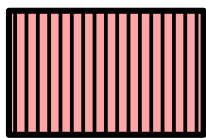
Scale represents 75 km



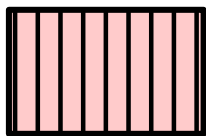
Nigeria: Mean Seasonal Temperature 1991-2020 Legend

Page 92

(degrees Celsius)



over 28



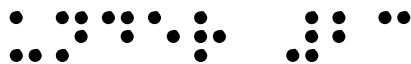
26-28



23-25

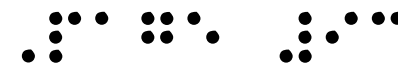
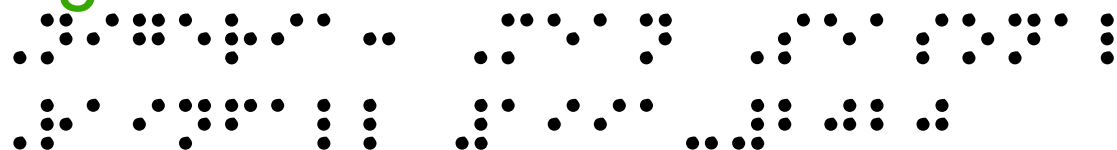


under 23





Nigeria: Mean Seasonal Rainfall 1991–2020



The following map presents the mean seasonal rainfall of Nigeria measured over the years 1991 to 2020, spanning the months of June to August, which are the peak of the rainy season in Nigeria. The figures are adapted from the archive of the Nigerian Meteorological Agency. The most tightly packed texture means more than eleven hundred millimetres. Next comes seven hundred to eleven hundred millimetres, then six hundred to seven hundred millimetres, and the most widely spaced texture means less than six hundred millimetres, the driest band of all. Breakpoints inside the country separate one rainfall band from the next, so you can feel exactly where the change happens.

Across the top of the country lies the driest region; below it, filling much of the middle and reaching east toward the border, is the band of six hundred to seven hundred millimetres, and it also forms a ring around a wetter area in the centre of the country. The wettest ground lies along the southern coast, where moist air arrives from the sea, with further wet patches on the Jos Plateau in the middle of the country and the Mambilla Plateau in the east, where high land forces the air upward and squeezes out more rain. The lesson to take from this map is that rainfall in Nigeria rises as you move south toward the ocean, but also rises wherever the land climbs, which is why the hills stay green while the far north is drier.

This description is also available in the audio track



Nigeria: Mean Seasonal Rainfall 1991-2020

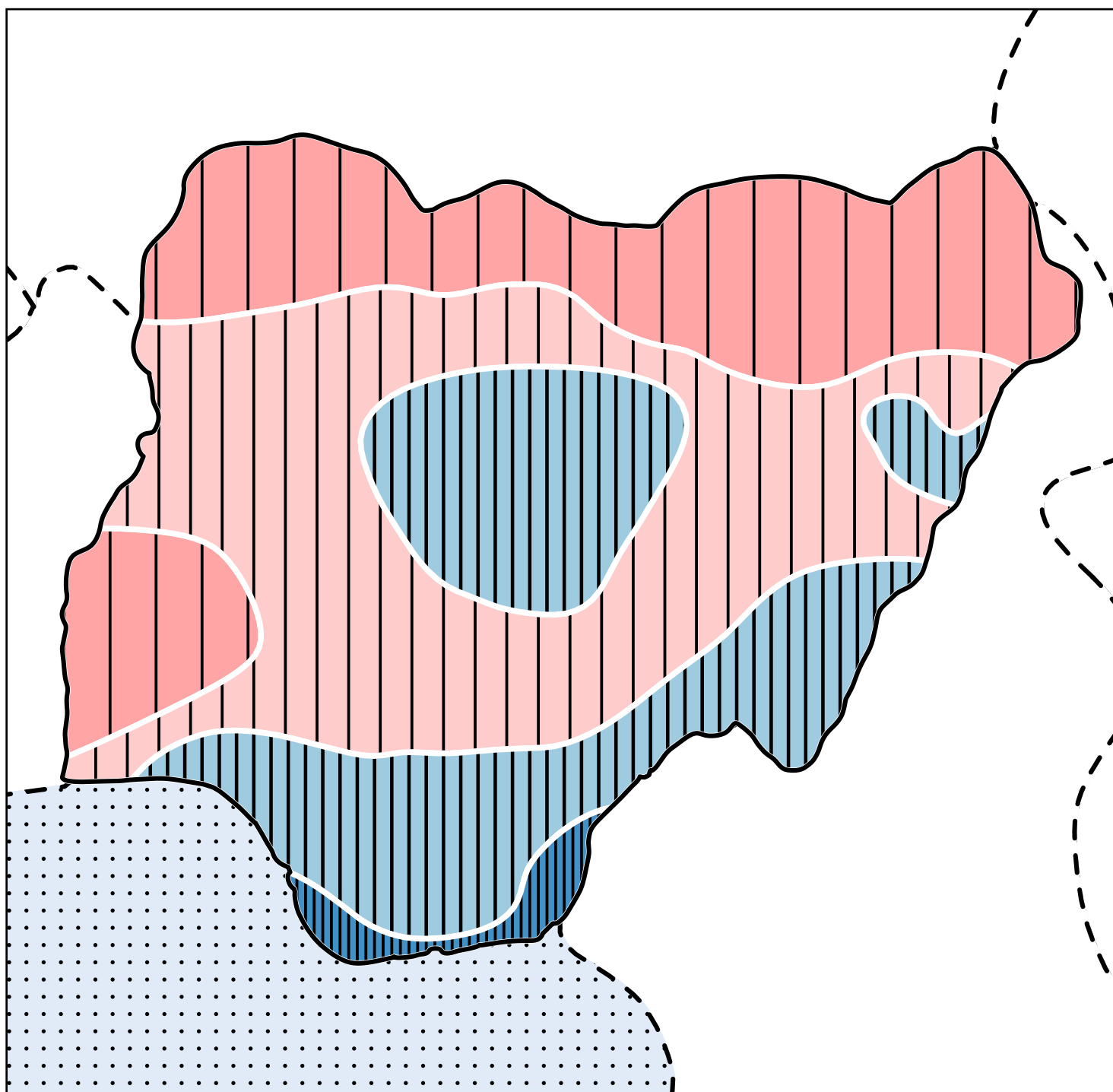
Page 94

Mean seasonal rainfall (mm) 1991-2020

1 cm
75 km

Scale represents 75 km

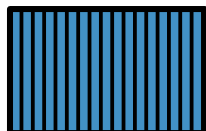
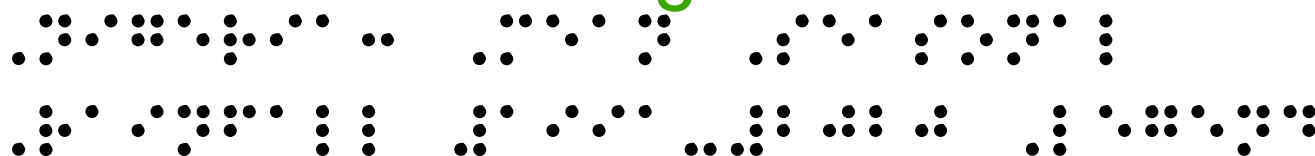
1:7,500,000





Nigeria: Mean Seasonal Rainfall 1991-2020 Legend

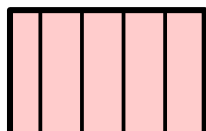
Page 95



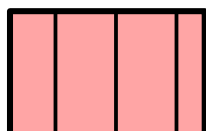
over 1,100 mm



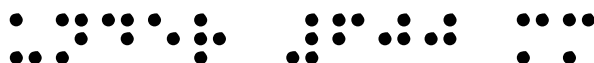
700 - 1,100 mm



600 - 700 mm

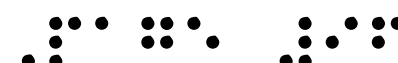


under 600 mm





Nigeria: Vegetation



The following map presents the country of Nigeria shaded to show how much vegetation covers the land, using the same four textures as the other vegetation maps. Neighbouring countries are delineated using dashed outlines on the left and on the right, and the dotted area at the lower left represents the water of the Gulf of Guinea, where the country meets the Atlantic Ocean. The textures lie in bands running from side to side, in the same order observed across West Africa, which makes sense because Nigeria sits inside that region. Along the northern border the fill is sparse, the driest ground in the country. Below it comes a wide band of low vegetation that takes up much of the middle. Below that lies a band of moderate vegetation, and the southern part, reaching down to the coast, is dense.

Reading this map from north to south, the land changes from sparse, to low, to moderate, to dense, growing greener the closer you come to the sea. The rain arrives from the ocean in the south, so the coastal south is thickly covered while the far north borders on desert. It is interesting a journey from the northern boundary to the coast will take you through all four levels of vegetation cover in turn. The legend for this map is the same one used for all the vegetation maps in this book, so the four textures you have already learned by touch apply here without change.

This description is also available in the audio track



Nigeria: Vegetation 2025

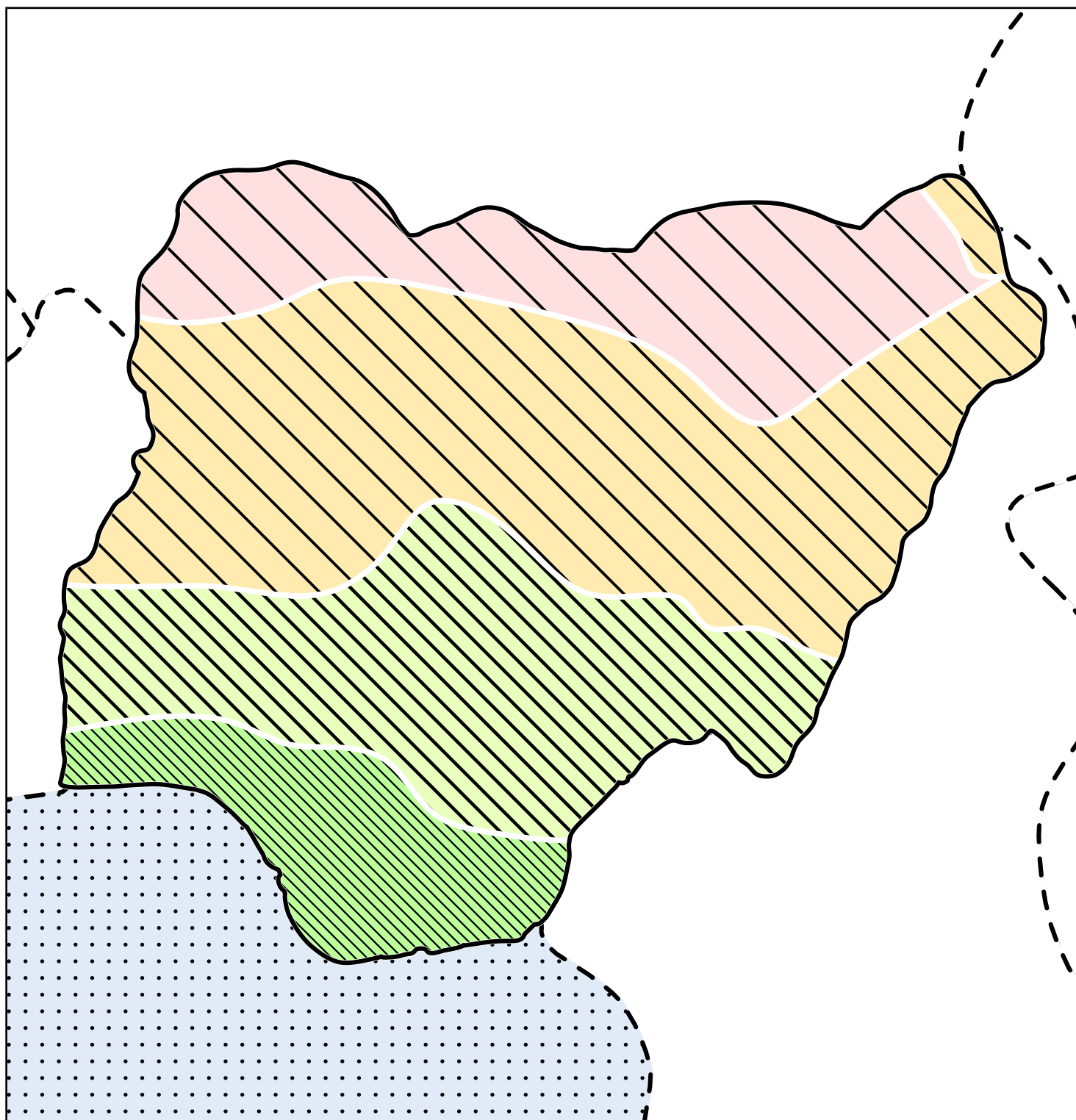
Page 97

Nigeria: Vegetation 2025

1 cm
75 km

Scale represents 75 km

1:7,500,000





Nigeria: Agroecological Zones

The following map presents the agroecological zones of Nigeria, the bands of land that share the same climate, soil and vegetation cover and so support the same kinds of farming. Along the northern border, the texture of small crosses marks the Sahel Savannah, the driest zone, where the land borders on desert. Below it, filling a wide stretch of the north, the plain slanted texture marks the Sudan Savannah. Across the middle of the country comes the Guinea Savannah, with its own slanted texture, and this is the largest zone of all. Toward the south, a narrower band marks the Tropical Rain Forest, and along the coast itself, at the very bottom, sits the Swamp Forest. Neighbouring countries are delineated using dashed outlines on the left and on the right, and the dotted area along the lower edge represents the water of the Gulf of Guinea.

Reading the map from north to south, the land changes in steady steps from Sahel Savannah, through Sudan Savannah and Guinea Savannah, into Tropical Rain Forest and finally Swamp Forest at the sea. The reason is rainfall, which increases the closer you come to the ocean, so grass and thorn give way to woodland, then to thick forest, and finally to the wet ground of the delta and the mangrove coast. This is why farming differs so much across the country: millet, sorghum and groundnut suit the dry northern zones, yam and maize belong to the middle belt, and cassava, oil palm and cocoa grow in the wet south.

This description is also available in the audio track

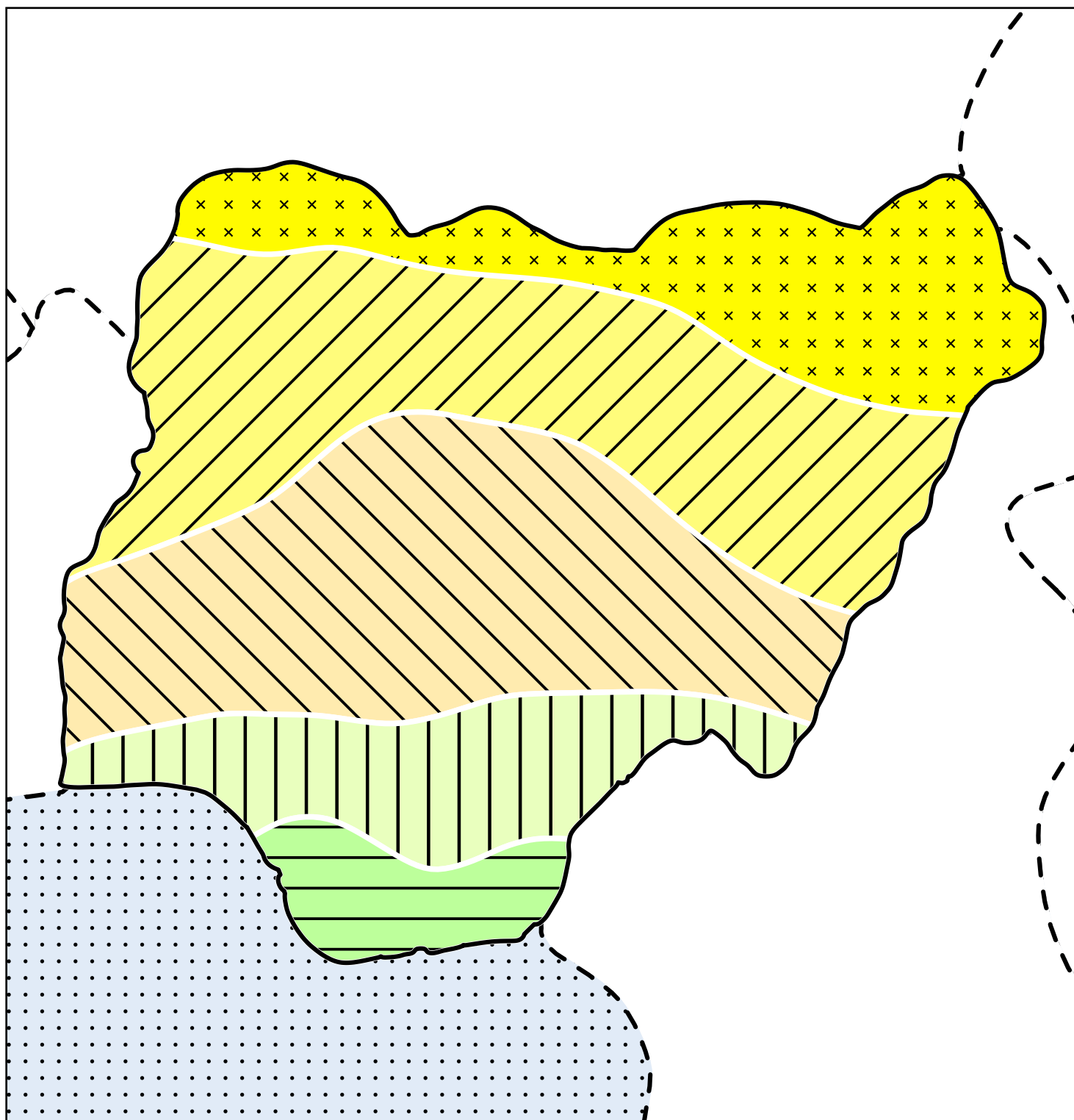
Nigeria: Agroecological Zones

Page 99

1 cm
75 km

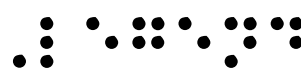
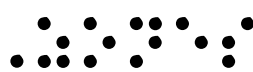
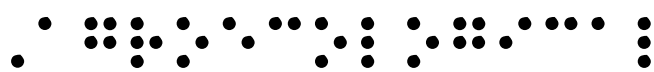
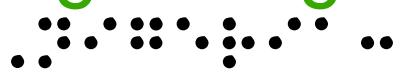
Scale represents 75 km

1:7,500,000

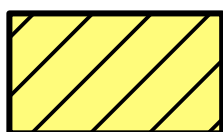


Nigeria: Agroecological Zones

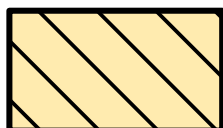
Page 100



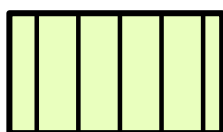
Sahel Savannah



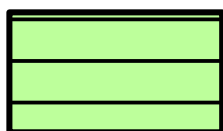
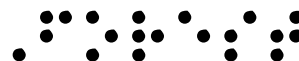
Sudan Savannah



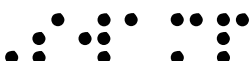
Guinea Savannah



Tropical Rain Forest



Swamp Forest





Nigeria: Foreign Trade 2020–2025

Exports and imports of Nigeria from 2020 to 2025, measured in trillion naira. The following charts present the foreign trade of Nigeria, the first showing exports and the second showing imports, both measured in trillion naira. The figures are adapted from the public data archive of the National Bureau of Statistics. Each chart is a bar chart with a vertical line on the left carrying the scale, marked at zero, at fifty and at one hundred, with a raised line running across the page at fifty and again at one hundred to help estimate the height of each bar. Six bars stand side by side along the bottom, one for each year from 2020 through to 2025, and every bar carries its value in braille just above its top.

Exports and imports of Nigeria from 2020 to 2025, measured in trillion naira.

The following charts present the foreign trade of Nigeria, the first showing exports and the second showing imports, both measured in trillion naira. The figures are adapted from the public data archive of the National Bureau of Statistics. Each chart is a bar chart with a vertical line on the left carrying the scale, marked at zero, at fifty and at one hundred, with a raised line running across the page at fifty and again at one hundred to help estimate the height of each bar. Six bars stand side by side along the bottom, one for each year from 2020 through to 2025, and every bar carries its value in braille just above its top.

On the export chart the bars rise year after year. They began at thirteen in 2020, and reached eighty-five in 2025. The import chart follows a similar shape but stays lower. It also begins at thirteen in 2020, then rises to sixty-seven in 2025. Compare the two charts bar by bar and the story becomes clear. In the first two years exports and imports were close together, and in 2021 imports were even slightly higher. From 2022 onward exports pull ahead, and the gap widens sharply in the final two years, when both charts show a steep climb. Nigeria therefore sold more abroad than it bought, which is called a trade surplus, and the very large rise in both bars after 2023 reflects the fall in the value of the naira as much as any growth in the goods themselves.

This description is also available in the audio track

Exports and imports of Nigeria from 2020 to 2025, measured in trillion naira.

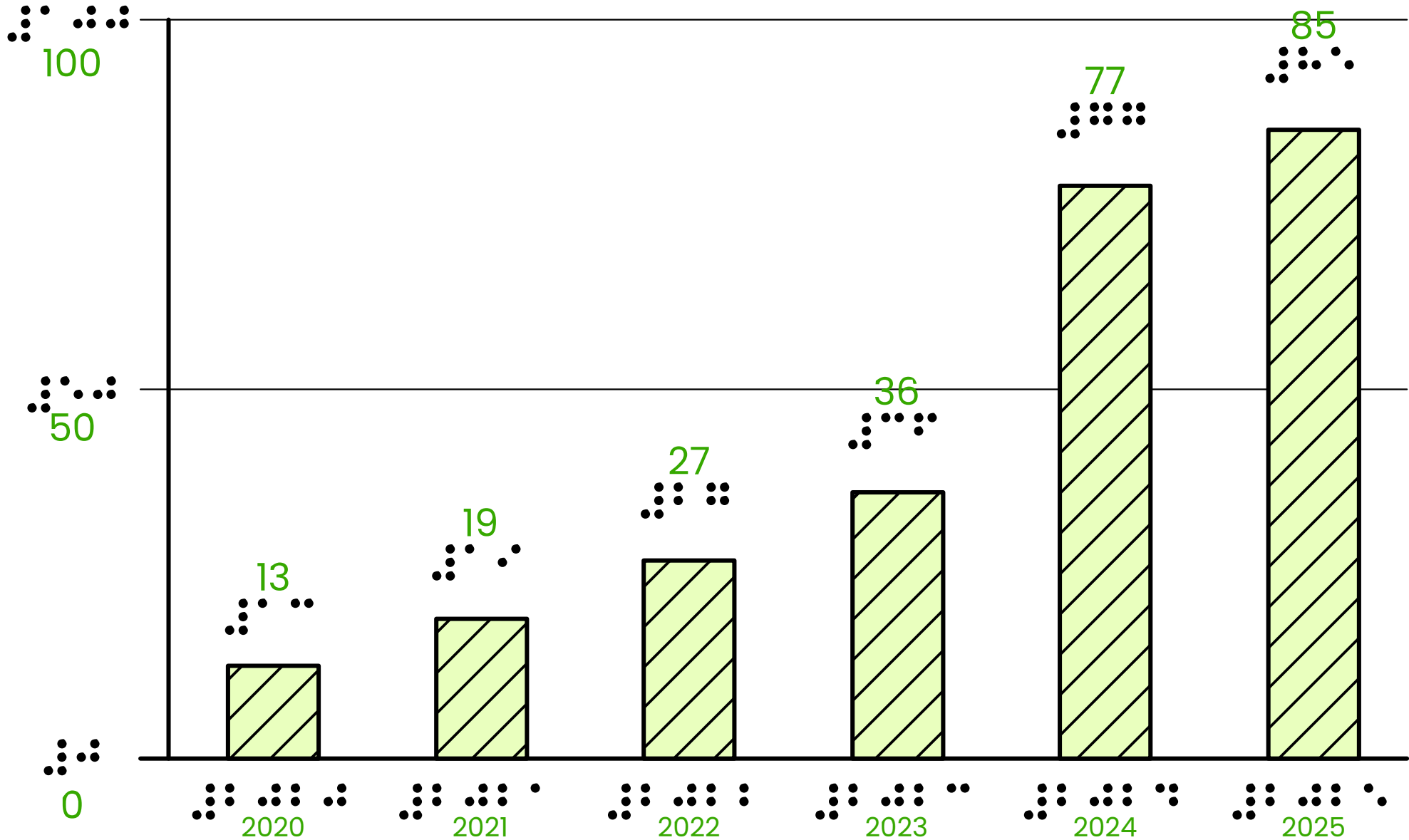


Nigeria: Exports in Trillion Naira

Exports in Trillion Naira

Exports in Trillion Naira

Exports in Trillion Naira

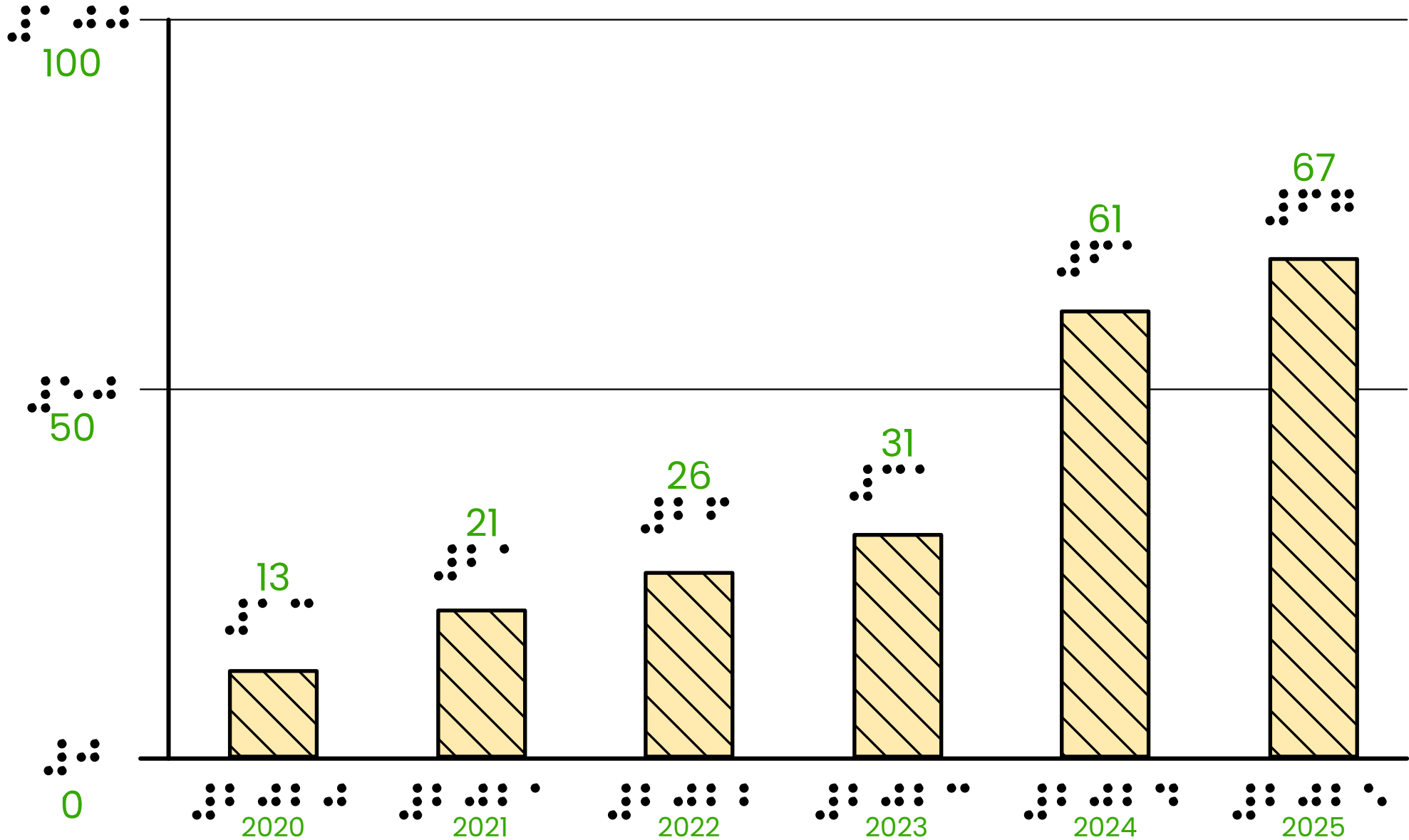




Nigeria: Imports in Trillion Naira

Imports in Nigeria have shown a steady increase from 2020 to 2025, rising from 13 trillion Naira to 67 trillion Naira.

Imports in Nigeria have shown a steady increase from 2020 to 2025, rising from 13 trillion Naira to 67 trillion Naira.





Data Sources

Administrative boundaries

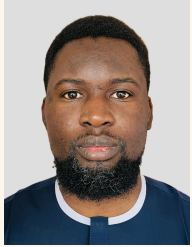
- World Map and Continents: Based on Esri's World Continents layer from <https://www.arcgis.com/home/item.html?id=57c1ade4fa7c4e2384e6a23f2b3bd254>
- Africa Regions, Countries: Based on Esri's Africa Countries layer from <https://www.arcgis.com/home/item.html?id=64aff05d66ff443caf9711fd988e21dd>
- Nigeria Country, States: Based on Esri's Nigeria Boundaries layer from <https://www.arcgis.com/home/item.html?id=dc4f102ec9bc47ed9fc66230ab0ba205>

Thematic Content

- Nigeria Administration 1963–1967: Based on Nigeria Administration map extracted from Macmillan Nigeria secondary atlas. First published. Ibadan : Macmillan Nigeria, 2006. ISBN 978-978-0183-55-4.
- Nigeria Geopolitical Zones: Created from the administrative boundaries by displaying the state boundaries based on the region they belong according to <https://services.gov.ng/about/egov>.
- Nigeria Population: Esri Population estimates through the Enrich tool in ArcGIS Pro using the administrative boundary as input
- Nigeria Transportation: OpenStreetMap contributors
- Nigeria: Temperature and Rainfall: Based on Nigeria Meteorological Agency (NiMet) Seasonal Climate Analysis 1991–2020 from http://maproom.nimet.gov.ng/maproom/Climatology/Climate_Analysis/seasonal.html
- Vegetation Cover: Based on Copernicus Climate Change Service (2020): Agrometeorological indicators from 1979 to present derived from reanalysis from <https://cds.climate.copernicus.eu/datasets/sis-agrometeorological-indicators?tab=download>
- Nigeria Agro-Ecological Zones: Based on Ajayi & Ogunrinde et.al., (2020). Investigation of Trends in Agricultural and Meteorological Drought in Nigeria. International Journal For Research in Applied Sciences and Biotechnology. 7. 281–294. 10.31033/ijrasb.7.5.37.
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NOTE: While the sources listed/cited above represents the sources of the original datasets used in the atlas, the datasets however were not presented in their original form, the datasets have been modified for simplification and cartographic generalization to serve the intended purpose.

About the Author



Bamidele Clement OKE is an Esri Certified geospatial professional who enjoys turning geographic data into meaningful maps, applications, and stories. He holds a Bachelor of Technology in Remote Sensing and GIS from the Federal University of Technology, Akure (FUTA), and is a recent graduate of the Erasmus Mundus Joint Master's Programme in Copernicus Masters in Digital Earth at Paris Lodron University Salzburg (PLUS) and Palacký University Olomouc (UPOL). Over the years, he has worked on projects ranging from enterprise GIS implementation and web mapping to spatial analysis and geovisualization.

The Tactile Atlas of Nigeria is a product of his masters thesis which reflects his interest in inclusive cartography and his belief that everyone should have the opportunity to explore and understand geographic spaces. By transforming maps into tactile experiences, this atlas seeks to make Nigeria's geography more accessible to people with visual impairments.

When he is not making maps, Bamidele enjoys building geospatial applications, sharing GIS knowledge, and exploring new food recipes or hacking a DIY project.

TACTILE ATLAS OF NIGERIA



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