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UPSC CSE MAINS

## GEOGRAPHY OPTIONAL

PAPER I

# Models, Theories and Laws

The complete Models, Theories and Laws section of Paper I — system analysis, population models, location theories, growth models, geopolitics and boundaries, with previous year questions.

Compiled by Arvind KrS

SYSTEM ANALYSIS | POPULATION MODELS | LOCATION THEORIES | GROWTH MODELS | GEOPOLITICS AND BOUNDARIES

| 18 | 5 | 94 | 84 |
|---|---|---|---|
| Chapters | Units | Previous year questions | Diagrams and figures |



IN THIS BOOK


01 Systems and Models

02 Population Models

03 Location Theories

04 Growth and Development Models

05 Geopolitics and Boundaries

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# Geography Optional — Models, Theories and Laws

Paper I · Models, Theories and Laws in Human Geography

Mains 2027 Edition · Compiled October 2026

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# How to read these notes

Every chapter is marked against the questions UPSC has actually asked on it, so the points that matter most stand out on the first read and are quick to find at revision.

A model is judged by whether it is appropriate, stimulating or significant, rather than true or false.

**Yellow marker: key point.** A point that carries the ideas UPSC has asked about in this chapter. Read these first, and make sure each one is in your answer.

**Isodapane** is a line through points of equal total transport cost, all materials and the product together.

**Blue marker: definition.** The cleanest definition of a term, ready to open an answer with.

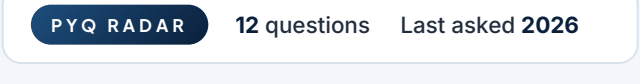
Around a source, each **isotim** is a concentric circle, spaced by freight per km.

**Saffron underline: PYQ term.** A key term or phrase that appears in this chapter's previous year questions.

### Spykman's Rimland Theory

PYQ 2026 · 2019 · 2004 +1

**PYQ tag on a heading.** The years in which UPSC asked about this section. Sections without a tag are background or linking material.




**PYQ radar.** At the start of each chapter: how many times the topic has been asked, and how recently. The contents page shows the same count for every chapter.

**Suggested method.** First read: the whole chapter. Revision: the yellow and blue marks, the tagged headings and the PYQ list at the end of the chapter. Last week before Mains: the PYQ list alone, answering each question in your head from the marked points.

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UNIT 03 | 4 CHAPTERS

# Location Theories

*Central place theories of Christaller and Lösch; von Thünen's model of agricultural location; Weber's model of industrial location.*

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PAPER I · MODELS, THEORIES AND LAWS

# Von Thunen's Theory of Agricultural Location

PYQ RADAR **9** questions Last asked **2026** 2026 · 2022 · 2020 · 2015 · 2010 · 2008 · 2002 · 1994 · 1987

CONTENTS

01 The Model
02 Testing the Model at Different Scales
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- **Von Thünen's theory of agricultural location** explains why land use changes with **distance from a market**. It is the earliest systematic model of land use in economic terms and the founding statement of **agricultural location theory**.
- It was set out by **Johann Heinrich von Thünen (1783–1850)**, a German landowner and economist, in *Der isolirte Staat* (*The Isolated State*). Part I appeared in **1826**; later parts followed in 1850 and 1863.
- Its core claim: on a uniform plain around one city, **transport cost alone** sorts farming into **concentric rings**, with intensive and perishable production near the city and extensive production far from it.
- **David Ricardo** explained economic rent through differences in **fertility**. Von Thünen's great addition is **locational rent**: rent that arises from **position** alone, even where all land is equally fertile.

## 01 The Model

### Background

- Von Thünen bought the **Tellow estate near Teterow in Mecklenburg** in 1809 and farmed it until his death.
  - From 1810 he kept **detailed cost accounts** of the estate. About forty years of this practical data lie behind the theory, so the abstract model rests on real costs and yields.

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- He used **isolating abstraction**: hold everything constant except one variable and watch what it does.
  - He also reasoned at the **margin**, which makes him a pioneer of marginal analysis in economics as well as of spatial economics.
- The work reached most geographers through **Peter Hall's edited English translation (1966)**, during the quantitative revolution. It then became one of the anchors of **locational analysis**.

## Aims

- To explain **why and how** agricultural land use varies with distance from the market.
- To rank crops by their **profit-making capacity** at each distance.
- To show how **transport cost** fixes the best zone for each crop.
- To introduce **locational rent** as the driver of land-use decisions in space.

## Key Terms

| TERM | MEANING |
|---|---|
| **Isolated state** | One city with its hinterland, cut off from the outside world by wilderness |
| **Isotropic surface** | A uniform plain, the same in terrain, soil and climate in every direction |
| **Hinterland** | The farming area that surrounds and supplies the market city |
| **Crop productivity** | Agricultural output per unit of input on a given area |
| **Intensive farming** | Heavy inputs of money, fertiliser and labour for high yield per unit area; two or more crops a year |
| **Extensive farming** | Low inputs over a large area with lower yield; fewer than two crops a year |
| **Mixed cropping** | Two or more crops grown together on the same land (wheat and gram) |
| **Economic rent (Ricardo)** | Net income from a piece of land above that of land at the margin of cultivation |
| **Locational rent (von Thünen)** | Economic rent that depends on a plot's position relative to the market |
| **Distance decay** | The fall in land rent away from the market; its rate differs by commodity |

## Assumptions

- **One market:** the isolated state has a single city and its agricultural hinterland, with no counter-magnet nearby.
- **Closed exchange:** the city buys only from the hinterland, and the hinterland sells only to the city.
- **Same price for all:** every farmer gets the same market price for a given crop.

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- **Isotropic plain:** a uniform physical environment around the city, with no river or mountain.
- **Economic man:** farmers maximise profit and know the market's needs fully.
- **One mode of transport:** the horse-drawn wagon, moving at walking pace on poor roads.
- **Linear freight:** transport cost rises directly with distance and with the weight of the produce.

## Two Postulates

- The **intensity of production** of a crop falls with distance from the market. Intensity means the amount of input per unit of land.
- The **type of land use** changes with distance from the market.
- From these he derived the land-use pattern that gives each farmer the highest return. The model therefore has two linked parts: **agricultural land use** and **economic rent**.

## Locational Rent

- All farmers receive the same price and bear the same production cost, so the **only advantage** one plot has over another is its **position**. A plot close to the market saves freight, and that saving is its rent.
- In the form given by **Edgar S. Dunn (1954)**:
  - **LR = Y(m – c) – Ytd**

| SYMBOL | STANDS FOR | EXPLANATION |
|---|---|---|
| **LR** | Locational rent | Net return per unit of land after production and freight costs |
| **Y** | Yield | Output per unit of land |
| **m** | Market price | Price per unit of output at the city |
| **c** | Production cost | Cost of producing each unit of output |
| **t** | Transport rate | Cost of moving one unit of output over one unit of distance |
| **d** | Distance | Distance between the farm and the market |

- **Locational rent differs from economic rent** in one respect: it ignores opportunity cost, that is, what the land could earn in another use.
- In the simplest case, freight is the only variable. **Rent falls in a straight line** with distance, and the **slope equals Y × t**.
  - The slope is steepest for **bulky or perishable** goods such as timber and dairy produce.
  - Each land use has its own line. Farmers choose whichever gives the **highest rent** at their distance, and the crossing points become the **ring boundaries**.
- **A worked example** (illustrative values):
  - Market gardening with Y = 25, m – c = 20 and t = 2 gives **LR = 500 – 50d**. Forestry with Y = 10, m – c = 32 and t = 2 gives **LR = 320 – 20d**.

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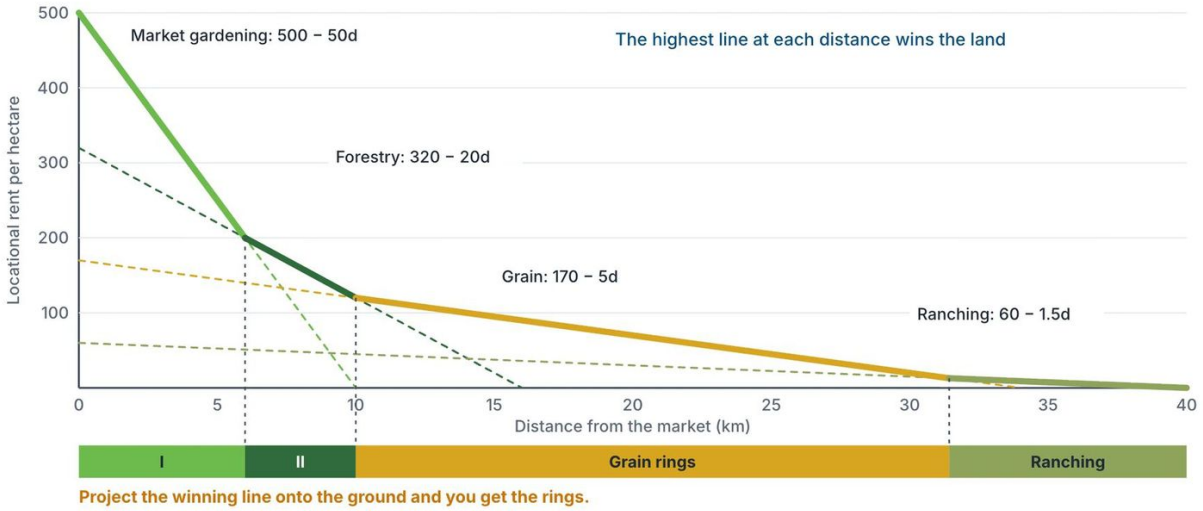
- The two are equal at **d = 6 km**, where each earns 200. Inside 6 km gardening pays more; beyond it, forestry does. That point is the boundary between Zones I and II.

- The result is a **rent gradient** that declines outward. Lines of equal rent around the city are called **iso-rent lines**.

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## From Rent Lines to Rings

Each land use has a straight rent line that falls with distance. Whichever line is highest at a given distance decides what is grown there.




Project the winning line onto the ground and you get the rings.

**The rent equation**

- **LR = Y(m − c) − Ytd**
- LR locational rent per hectare, Y yield per hectare
- m market price, c production cost, per unit
- t freight per unit per km, d distance

**Why the slopes differ**

- Slope = Y × t, so bulky, heavy or perishable output falls fastest
- Height at the market = Y(m − c)
- Steep lines win near the city, flat lines far away

**Values used here**

- Gardening Y 25, m−c 20, t 2
- Forestry Y 10, m−c 32, t 2
- Grain Y 5, m−c 34, t 1
- Ranching Y 2, m−c 30, t 0.75

Schematic worked example with illustrative values, not von Thünen's own figures. Rent equation in the form given by Edgar S. Dunn (1954).

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## Intensity Theory

- Freight rises with distance, so **intensive cultivation suits land near the city**. The intensity of production of any one crop declines as distance grows.
- The more money, labour and fertiliser applied, the higher the intensity. That extra spending pays only where **freight is low** and the land dear.

## Crop Theory

- Land use varies with distance because of four things: **market price, transport cost, production cost and yield**. Two cases show how.

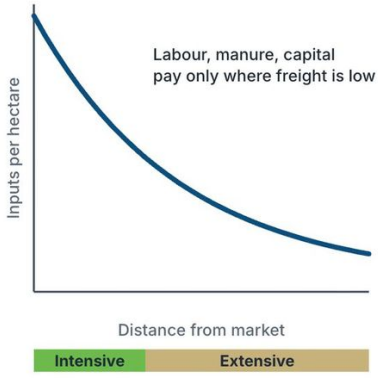
- **Case 1: same yield and production cost, different freight and price.**
  - If crop P costs more to haul and sells for more than crop Q, then **P grows nearer the market**. Its rent falls faster, but its higher price wins the inner land.
  - Fresh milk and wheat are the example. Milk is perishable and bulky, so it stays next to the city.
- **Case 2: same production cost and freight rate, different yield and price.**
  - If crop X yields more and sells for less than crop Y, then **X grows nearer the market**. Its large tonnage makes total freight per hectare high, so its rent line is steep.
  - Potatoes and wheat are the example. Potatoes pay best close in, wheat further out.

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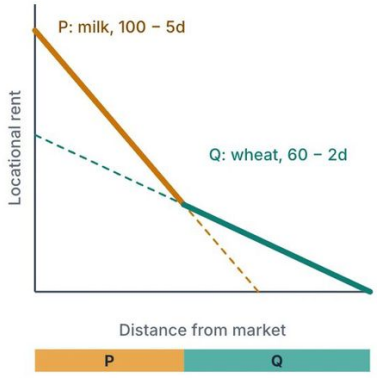
## Intensity Theory and Crop Theory

The model has two parts: how hard a given crop is farmed changes with distance, and which crop is grown changes with distance.

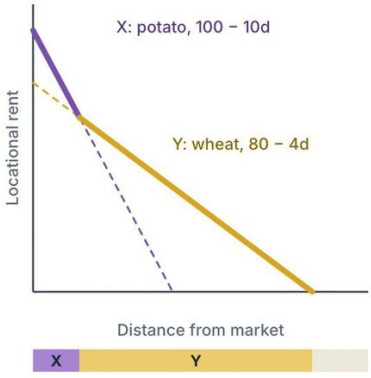
**A. Intensity theory**
Inputs per hectare fall with distance




**B. Crop theory, case 1**
Same yield and cost; P dearer, costlier to haul




**C. Crop theory, case 2**
X yields more, sells for less; same freight




**Reading A**
The further from the market, the less it pays to spend on each hectare. The same crop is farmed less intensively as distance grows.

**Reading B**
P's rent falls faster because it costs more to haul, but its higher price lets it outbid Q near the city. Milk beats wheat there.

**Reading C**
X's heavy yield makes its total freight per hectare high, so its rent line is steep. Potatoes hold the inner land, wheat the outer.

Schematic; values are illustrative.

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## The Six Concentric Rings

| ZONE | LAND USE | CHARACTER | WHY IT SITS HERE |
|---|---|---|---|
| I | Market gardening and milk | Vegetables, fruit, flowers, fresh milk; most intensive, kept fertile with city manure | Perishable, and no refrigeration or fast transport existed |
| II | Firewood and lumber | Fuel and building timber | Bulky and heavy for its value, yet in great demand in the city |

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| ZONE | LAND USE | CHARACTER | WHY IT SITS HERE |
|---|---|---|---|
| **III** | Grain, no fallow | Rye in intensive crop rotation; highest cropping intensity of the grain rings | Grain stores and travels well; land is cheaper |
| **IV** | Grain, about 14% fallow | Seven-year rotation: rye, barley, oats, three years of pasture, one year of fallow; also butter, cheese, live animals | Less productive at this range; products keep longer than fresh milk |
| **V** | Three-field system | One-third rye, one-third pasture, one-third fallow | Distance makes high inputs unprofitable |
| **VI** | Livestock ranching | Cattle, butter, cheese, live animals | Animals walk to market; by-products are compact; rye no longer yields enough rent |

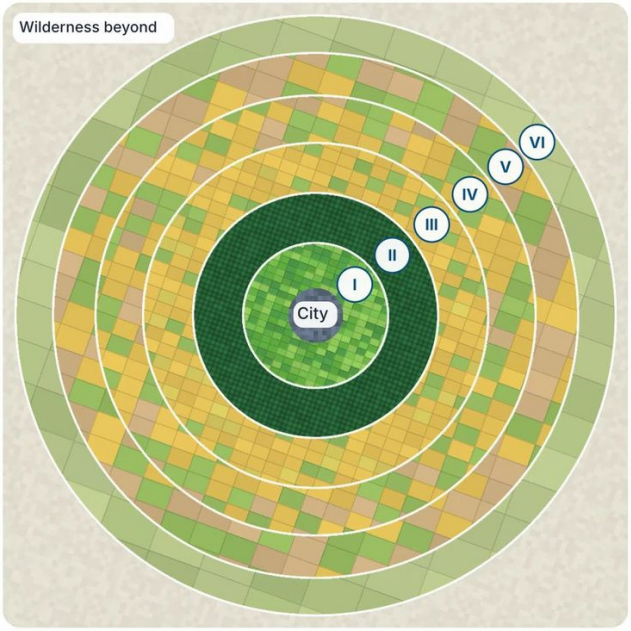
- **Beyond Zone VI** lies wilderness, where farming no longer pays. This is what isolates the state.
- **Why forest comes before farmland:** this ring surprises most readers.
  - Fuelwood is extremely bulky for its value, and wood was the main fuel and building material of cities in the early nineteenth century.
  - Hauling it by wagon cost far more than hauling grain of equal value. Its rent line therefore falls steeply and beats grain close to the city.

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## The Isolated State: Six Rings Around One Market

Johann Heinrich von Thünen's model of 1826: with one city, a uniform plain and a single means of transport, distance alone sorts land use into concentric rings.




**I — Market gardening and milk**
Vegetables, fruit, flowers, fresh milk
Perishable, so nearest; heavy manuring

**II — Firewood and lumber**
Fuel and building wood for the city
Bulky and costly to haul, so close in

**III — Grain, no fallow**
Rye in intensive crop rotation
Highest cropping intensity of the grain rings

**IV — Grain, 1 year in 7 fallow**
Rye, barley, oats, 3 years pasture, fallow
Seven-year rotation; also butter, cheese

**V — Three-field system**
⅓ rye, ⅓ pasture, ⅓ fallow
Extensive; low inputs per hectare

**VI — Livestock ranching**
Cattle, butter, cheese, live animals
Animals walk to market; rye no longer pays

**Intensity and rent per hectare fall outward, ring by ring.**

Schematic; ring widths are illustrative. Field patterns show the crop mix of each ring, after von Thünen, Der isolirte Staat (1826).

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## Modifications by von Thünen Himself

- He tested his own model by relaxing two assumptions.
- **A navigable river:** freight along it was faster and cost about **one-tenth** of land freight.
  - Production zones **stretch along the river**.
  - Zone I changes least. Zone II extends as a narrow band up and down the stream, since riverside land is the best place to grow something so costly to haul.
- **A second market:** a small town with its own tributary area adds a small set of zones of its own.
  - Several towns of similar size would produce **intermingled zones** that modify one another. Around any one city the zonation may then become rudimentary.

| CLASSICAL MODEL | MODIFIED MODEL |
|---|---|
| **Perfect concentric rings on a uniform plain** | Elongated zones along rivers and roads |
| **One central market** | Several markets of varying importance |
| **Same freight rate in every direction** | Differential freight; waterway about one-tenth of land |

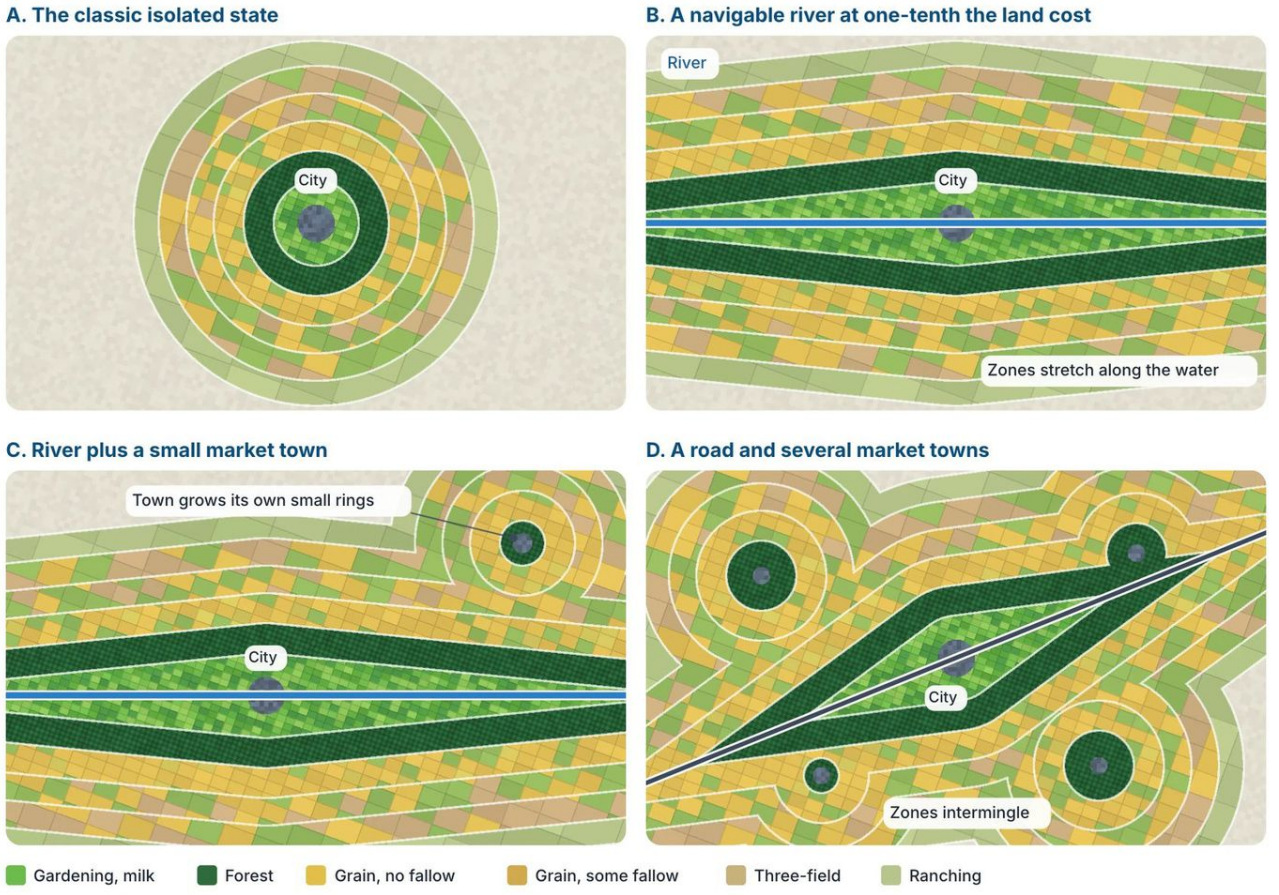
| CLASSICAL MODEL | MODIFIED MODEL |
|---|---|
| **Zones separate and non-overlapping** | Zones intermingled and overlapping |

- Later writers added further distortions: a **fertile tract** that shifts rent locally, unequal **quantity and quality of information**, and **non-optimal behaviour**. Together these make a mosaic out of the rings while leaving the logic intact.

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## When the Assumptions Are Relaxed

These maps are computed from least-cost distance to market: a cheap route pulls zones along it, and a second market breaks the rings into a mosaic.




### What von Thünen himself changed

- A navigable river, with freight about one-tenth of land cost
- A small town with its own tributary area

### What follows

- Rings become elongated bands along cheap routes
- Forest moves up and down the river
- Several markets merge the rings into a mosaic

### Why it matters

Relax two assumptions and the geometry changes completely, while the logic stays: land goes to the use that bids most after freight.

Schematic; zones computed from least-cost distance with illustrative costs and market sizes.

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# 02 Testing the Model at Different Scales

## Micro Scale: The Farm and the Village

- The model also works at the scale of a **farm or village**, where the "market" is the farmstead and the cost is **labour and travel to the field**.
- **Michael Chisholm (1962)** showed that returns fall with distance from the farmstead in many parts of the world. **Piers Blaikie (1971)** examined this spatial organisation in **north Indian villages**.
- In the villages of India's **Great Plains**, rough rings can still be seen:
  - **Innermost land:** the most fertile and heavily manured plots, under vegetables, potatoes and orchards.
  - **Middle belt:** rice, wheat, barley, maize, pulses and sugarcane.
  - **Fringe:** inferior cereals such as bajra, guar and millets.

## Meso Scale: The City Region

- **Ronald J. Horvath (1969)** found a **eucalyptus forest of 95 square miles** around Addis Ababa supplying the city's firewood and building material.
  - It stretched along the improved roads, much as Zone II stretches along von Thünen's river, and smaller Ethiopian towns had forests of their own.
- **Indian cities** show the same logic. Perishables such as vegetables and milk cluster round Delhi and Mumbai, while cereals and pulses dominate remoter districts.
  - The **East Kolkata Wetlands** still feed Kolkata with vegetables and fish grown on the city's edge.
- **Indian field tests** give a mixed verdict.
  - **Mohammad Shafi**, working in Koil tehsil of Aligarh, found that land-use intensity falls away from intensively **tubewell-irrigated** areas rather than simply from the market.
  - Tests in Punjab concluded that the model cannot apply in its original form, because **irrigation and dense transport networks** have reshaped cropping and intensity.

## Macro Scale: Europe

- **Samuel Van Valkenburg and Colbert C. Held** mapped agricultural intensity across Europe and found a striking **ring-like pattern**. They indexed the yields of wheat, barley, oats, potatoes, sugar beet and hay, with the European average as 100.
- Transport has allowed the isolated state to grow from an estate to a continent. Its centre is no longer one town but the **urbanised North Sea coast**.

| REGION | INTENSITY INDEX | THÜNEN EQUIVALENT |
|---|---|---|
| **Netherlands, Belgium** | Highest (above 160) | Zone I: intensive farming at the market core |
| **Denmark, north Germany, France, UK** | High (125–160) | Zones II–III: mixed intensive farming |

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| REGION | INTENSITY INDEX | THÜNEN EQUIVALENT |
|---|---|---|
| **Switzerland, Austria** | Moderate (100–125) | Zones III–IV |
| **Eastern Europe** | Below average (70–100) | Zones IV–V: less intensive cereals |
| **Mediterranean periphery** | Low (below 70) | Zones V–VI: extensive farming and grazing |

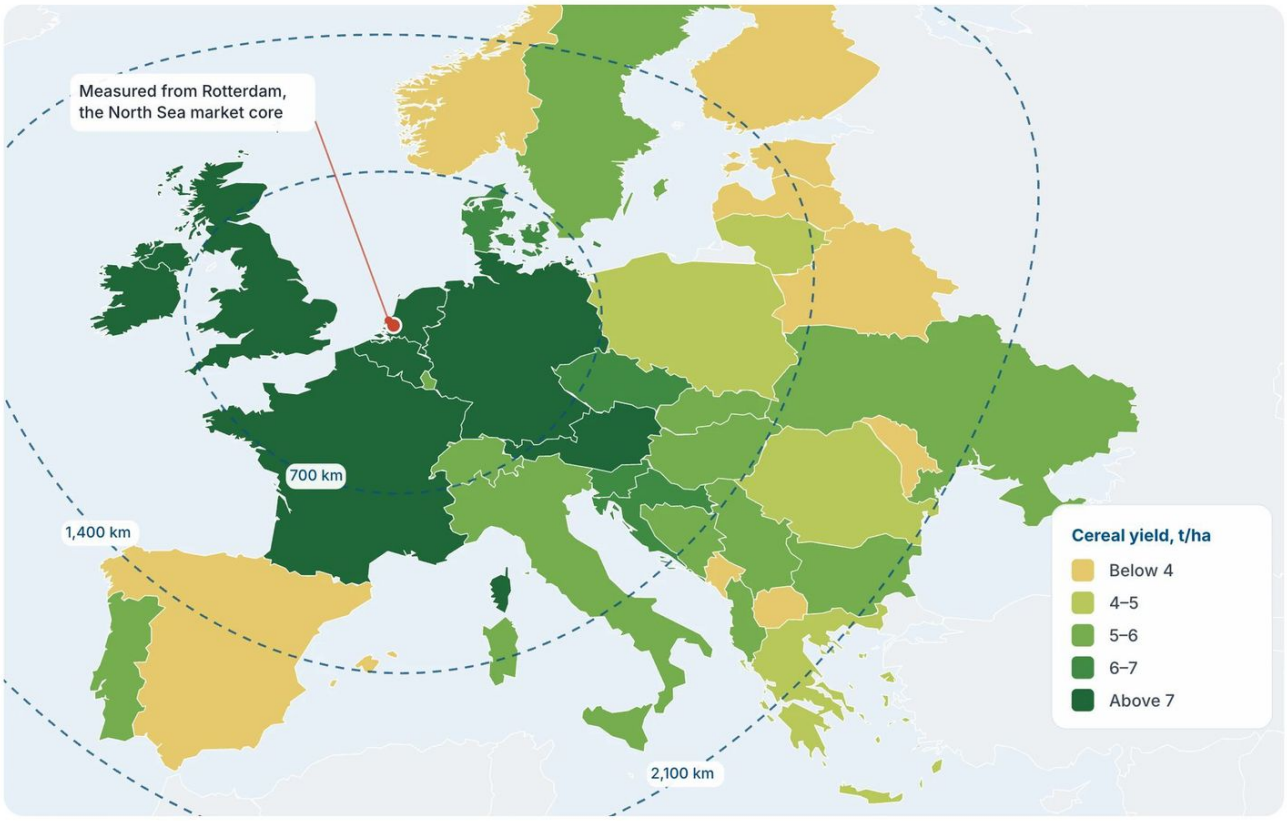
- Current figures keep the broad pattern. Cereal yield averaged about **7.0 t/ha within 700 km of Rotterdam** in 2021–23, against about **4.2 t/ha beyond 1,400 km**.
- **Distance is not the only cause.** The periphery has much less good land (Alps, Pyrenees, Apennines), and climate, subsidy and capital all add to the gradient. Modern routes also bend the rings along roads and railways.
- **Richard Peet (1969)** traced the same expansion historically: as freight fell in the nineteenth century, the zones supplying Britain's market spread overseas.

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## A Thünen Gradient Across Europe

Average cereal yield per hectare is highest around the North Sea and generally falls with distance from it, which echoes the rings at a continental scale.




**The gradient is real**

- Within 700 km: 7.0 t/ha on average (8 countries)
- 700–1,400 km: 5.7 t/ha (13)
- Beyond 1,400 km: 4.2 t/ha (15)

**Distance is not the only cause**

- Correlation with distance is r = -0.77 across 36 countries
- Dry Spain and cold Finland fall low partly on climate
- Soil, subsidy and capital all add to the pattern

**Same logic, new scale**

The market is no longer one town but the urbanised North Sea coast. Transport let the isolated state grow from an estate to a continent.

Data: World Bank / FAO indicator AG.YLD.CREL.KG, mean of 2021–2023, national averages. Distances are from Rotterdam to country centres. Base map: Natural Earth.

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## Macro Scale: United States

- The supercity that anchors this system is the **north-eastern Megalopolis**, the country's main food market and transport focus.

| AGRICULTURAL REGION | LOCATION | THÜNEN EQUIVALENT | MAIN PRODUCTS |
|---|---|---|---|
| **Atlantic fruit and vegetable belt** | Nearest Megalopolis | Zone I | Fresh produce |

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| AGRICULTURAL REGION | LOCATION | THÜNEN EQUIVALENT | MAIN PRODUCTS |
|---|---|---|---|
| **Dairy belt** | North-east, Great Lakes | Zones I–II | Milk, cheese, butter |
| **Corn belt** | Midwest, Ohio to Nebraska | Zone III | Meat, mixed crops, feed |
| **Wheat belts** | Great Plains | Zones IV–V | Wheat in bulk |
| **Grazing region** | Rocky Mountain West | Zone VI | Beef cattle, sheep |

- The rings are not circular here, but the **sequence** of regions westward along the main trans-continental route fits the model's logic.
- **Railways changed the order:** wood could now travel cheaply, so the forest ring moved to the outer limits of the system.

## 03 Evaluation

### Limitations

- **Unrealistic assumptions:** an isolated state with one market and a uniform plain hardly exists. Soil and climate vary everywhere, and physical advantages cannot be taken for granted.
- **Static and deterministic:** growth and changing demand alter land use over time, but the model has no dynamics.
- **Demand is left out:** the demand for a crop has a large effect on cropping pattern and intensity.
- **Freight is not linear:** the cost per tonne-kilometre falls with longer hauls, and it varies by mode.
- **Economic man is a fiction:** farmers act on habit, risk and custom.
  - **Julian Wolpert (1964)** found farmers settling well short of the profit-maximising optimum, which shows the model oversimplifies decisions.
  - Under **collective farming** in Russia, China and Eastern Europe, the decision was made by the state.
- **Hard to measure:** economic rent and intensity are difficult to test because man-days and input costs are not uniform between farming types.
- **Not all farming types exist everywhere:** in many European countries the old arrangement of farm types around a market has gone.
- **Technology has shrunk distance:** when the model was written, loaded carts moved at walking pace. Modern transport allows a **space-time convergence** of distant places.

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## Sinclair's Inversion

- **Robert Sinclair (1967)** offered the sharpest critique. Near expanding cities in industrial countries, the main force is not freight but **urban expansion**.
  - Land near a growing city is valued for its **future urban use**, so farmers expect to sell and stop investing. Agricultural intensity therefore often **rises with distance**, the reverse of von Thünen.
- His five zones run outward from the city edge:
  1. **Urban farming:** greenhouses, poultry and mushroom units in scattered, short-lived plots.
  2. **Vacant and grazing:** land held by speculators, with temporary grazing.
  3. **Field crops and grazing:** transitional farming with little capital investment.
  4. **Dairying and field crops:** the city's main fresh-milk supply area.
  5. **Specialised feed grain and livestock:** beyond the city's direct influence, serving a national market.
- Sinclair did not reject von Thünen outright. He held that the older model still applied in **less developed regions** where transport cost remained the main force.
- **India's urban fringe** shows both forces at once. Farmland around Gurugram, Noida and Bengaluru is often held for sale, while intensive vegetable and dairy units persist beside it. The **rural-urban fringe** is where this contest plays out.

MODELS, THEORIES AND LAWS · VON THÜNEN

### Sinclair's Rings: Thünen Turned Inside Out

Around expanding cities the anticipation of urban growth can reverse the gradient, so the least intensive farming lies closest to the city.

**Von Thünen, 1826**

Transport cost rules: intensity falls outward




- 1 Gardens, milk
- 2 Forest
- 3 Grain
- 4 Three-field
- 5 Ranching




**Robert Sinclair, 1967**

Urban expansion rules: intensity rises outward




- 1 Urban farming
- 2 Vacant, grazing
- 3 Field crops, grazing
- 4 Dairying, field crops
- 5 Feed grain, livestock




**The driver**

- Land near a growing city is valued for its future urban use
- Farmers expect to sell, so they stop investing

**The result**

- Greenhouses and poultry units on the edge
- Then land left idle or lightly grazed
- Real farm investment only further out

**Where it applies**

- Fast-growing metropolitan fringes
- Fails where a green belt or zoning limits speculation
- Weak far from the urban edge

Schematic. Von Thünen's grain rings are merged here to give five bands. After Robert Sinclair, Annals of the Association of American Geographers (1967).

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## Strengths and Enduring Value

| LIMITATION | COUNTERPOINT |
|---|---|
| **Assumes uniform terrain** | The core principle (distance, cost, land-use gradient) survives when terrain modifies it |
| **No refrigeration or modern logistics** | Perishable and high-value crops still broadly favour urban proximity |
| **Ignores demand** | Prompted later work that added it, such as Dunn (1954) and Alonso (1964) |
| **Static** | A benchmark for measuring change, and a base for dynamic land-use models |
| **Oversimplifies decisions** | Drew behavioural critiques that enriched the field |

- It should be judged by its time: in 1826 transport was poor and isolated estates were common over much of the world.
- It has lasting worth in two ways:
  - It turned attention to **economic factors**, above all freight and distance, when earlier geographers looked mainly to the physical environment.
  - It gave **locational rent** to both rural and urban land-use studies.
- It stimulated urban models, notably the **bid-rent theory** of **William Alonso (1964)**, and it stands with **Alfred Weber's industrial model** and **Walter Christaller's central place theory** in classical location theory.

| ASPECT | VON THÜNEN (1826) | ALFRED WEBER (1909) | WILLIAM ALONSO (1964) |
|---|---|---|---|
| **Focus** | Agricultural land use | Industrial location | Urban land use |
| **Key variable** | Distance to market, freight | Least total cost (freight, labour) | Willingness to pay for land |
| **Spatial pattern** | Concentric farming rings | Locational triangle | Concentric urban rings |
| **Rent** | Locational rent is central | Not central; cost is minimised | Bid-rent curves by land user |
| **Scale** | Rural | Industrial, regional | Intra-city |
| **Main limit** | Static, ignores demand | Ignores demand and later dynamics | Assumes uniform urban space |

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# 04 Relevance Today

PYQ 2022 · 2020 · 2015

## What Has Weakened the Rings

- **Refrigeration and cold chains:** perishables now travel thousands of kilometres. New Zealand butter and meat reach Britain after a sea voyage of over 17,000 km.
  - India had **8,815 cold stores** with **402 lakh tonnes** of capacity in June 2025 (PIB).
- **Fast freight:** air cargo overcomes proximity for high-value goods. **Kisan Rail** has moved about **7.9 lakh tonnes** of perishables on 2,364 services since August 2020.
  - Milk is the clearest Indian case: Anand's cooperative milk reaches distant metros by rail and road tanker.
- **Global trade:** food and agricultural trade grew from **USD 400 billion in 2000 to USD 1.9 trillion in 2022** (FAO). Local distance matters less where the market is the world.
- **Irrigation and seed:** tubewells and **high-yielding varieties** let better-off farmers grow perishables in distant fields, and have made the model of little use at micro and meso levels in the Great Plains.
- **Land reform:** consolidation of holdings changed the crop rings, since each farmer now grows food for the household and some cash crops on one block.
- **State intervention:** subsidies and procurement change crop choice regardless of market logic.
- **Several markets:** urbanisation warps the zones through many overlapping markets.

## When the Model Is Still Rational

PYQ 2026

- The model holds wherever **freight remains a large share of a crop's value**. That gives a clear set of conditions:
  - **Weak roads and no cold chain:** in much of sub-Saharan Africa and in remote parts of India, distance still sets what can be sold. In Ethiopia, teff farmers closer to cities receive better prices, use more modern inputs and get higher yields, and the effect is strongest near Addis Ababa (2019 study).
  - **Highly perishable or low-value bulky goods:** leafy vegetables, fresh milk and flowers still favour the urban edge, and straw and fodder rarely travel far.
  - **Small farmers on foot:** head-load and cart distance decide which plot gets the manure and the labour.
  - **Disruption:** the 2020 lockdown stranded perishables, and the Red Sea diversions from late 2023 raised long-haul freight. Local supply gains whenever distance becomes costly again.
  - **Firm location:** agribusinesses place processing plants and distribution centres to cut distance and freight, applying the same logic at corporate scale.
- **The spatial pattern is an ideal type;** the analytical framework is the lasting part. Rings fade, but land still tends to go to the use that bids most after paying for distance.
- **Open questions** now include a truly **dynamic** version of the model, the place of **risk** in farmers' choices, and its use with **GIS and spatial econometrics**.

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## Newer Uses of the Model PYQ 1994

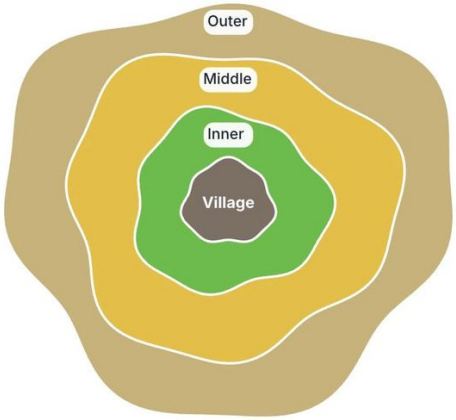
- **Forest frontiers:** the outer edge of the rings is where farming stops being worth the distance, so anything that raises rent pushes that edge into the forest.
  - **Kenneth M. Chomitz and David A.** Gray (1996) applied this logic to southern Belize, showing that **market access, land quality and tenure** together decide land use. Roads into poor soils can cost forest while returning little.
  - **Arild Angelsen (2007)** used the model to explain tropical deforestation and tied it to **forest transition theory**: forest is lost while farm rent rises and recovers when farm rent falls or forest rent rises.
- **Rural roads and market access:** a new road lowers *t* and moves every ring outward. Programmes such as **Pradhan Mantri Gram Sadak Yojana (2000)** work directly on this variable.
- **Price information:** the **e-NAM** electronic market platform (2016) narrows the information gap between distant farmers and markets, one of the complications later writers added to the model. It does not reduce freight.
- **Carbon and food miles:** a carbon charge on freight would act like a higher *t* and favour nearby supply. The effect is limited, because production usually matters more than transport in food's total emissions.

MODELS, THEORIES AND LAWS · VON THÜNEN

### When Is the Model Still Rational?

The rings hold wherever freight remains a large share of a crop's value. They fade as cheap, cold, fast transport and non-market forces take over.

**Micro scale: rings round a plains village**




- Village site (abadi)
- Vegetables, potato, orchards, well-manured
- Wheat, rice, maize, pulses, sugarcane
- Bajra, guar, millets, fallow

**Macro and meso scale: what weakens distance, what keeps it**

| Weakens the rings | Keeps the rings rational |
|---|---|
| **Refrigeration and cold chains** India: 8,815 cold stores, 402 lakh t capacity (June 2025) | **Weak roads, no reefer vans** Freight is still a large share of value |
| **Fast perishables freight** Kisan Rail: 2,364 services, 7.9 lakh t of produce since August 2020 | **Short-life, bulky produce** Fresh milk, leafy greens, flowers |
| **Global food trade** USD 400 bn in 2000 to USD 1.9 tn in 2022 | **Small farmers, small plots** Head-load and cart distance decide which field gets the manure |
| **Irrigation and new seed** Tubewells and HYVs let perishables grow far from market | **Rising freight or disruption** Fuel, war and blocked routes bring distance back |
| **Policy and behaviour** MSP, input subsidies, risk, custom | **Peri-urban belts** Vegetables and dairy still crowd round Indian metros |

Village rings are schematic. Data: PIB, 28 September 2025 (cold storage) and 2 April 2025 (Kisan Rail); FAO, State of Agricultural Commodity Markets 2024.

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## Summary

| CATEGORY | DETAILS |
|---|---|
| **Author** | Johann Heinrich von Thünen (1783–1850), German landowner and economist |
| **Work** | *Der isolirte Staat*, Part I, 1826 |
| **Data** | About forty years of cost accounts from his estate at Tellow, Mecklenburg |
| **Core concept** | Locational rent |
| **Formula** | LR = Y(m – c) – Ytd |
| **Output** | Six rings: gardening and milk, forest, grain without fallow, grain with fallow, three-field, ranching |
| **Modifications** | Navigable river; second market |
| **Main critique** | Unreal assumptions; static; Sinclair's inversion near growing cities |
| **Value today** | A framework at micro, meso and macro scales, wherever freight still matters |

## Previous Year Questions

- 2026 — "Under what situations Von Thunen's model of agricultural location is still rational." Justify with examples.
- 2022 — Explain the relevance and applicability of Von Thunen's theory of agricultural location in today's world.
- 2020 — Write a note on the relevance of Von Thunen's agricultural location theory in the present context.
- 2015 — Discuss the relevance of Von Thunen's model on agricultural location in the contemporary context.
- 2010 — Write short explanatory note on von Thunen's concept of economic rent.
- 2008 — Discuss the views of von Thunen on agricultural location.

| | |
|---|---|
| 2002 | Write short note: Isolated state. |
| 1994 | Discuss Von Thunen's model of agricultural land use and examine if the model is applicable to India. |
| 1987 | Write short note: Theories of agricultural location. |

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UNIT 05 | 5 CHAPTERS

# Geopolitics and Boundaries

*Heartland and Rimland theories; laws of international boundaries and frontiers.*

CHAPTERS


| | | |
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PAPER I · MODELS, THEORIES AND LAWS

# Heartland and Rimland theory

PYQ RADAR **12** questions Last asked **2026** 2026 · 2024 · 2020 · 2019 · 2017 · 2013 · 2005 · 2004 · 2002 · 1994 · 1989 · 1988

CONTENTS

01 Geopolitics and the Land-Sea Contest
02 Mackinder's Heartland Theory
03 Spykman's Rimland Theory
04 Comparison and Later Views
05 The Present Geopolitical Scenario, October 2026
06 Previous Year Questions

- **Heartland and Rimland** are the two classic models of **geopolitics**, the study of how geographical position, resources and movement shape the power of states.
- **Halford John Mackinder (1904, 1919, 1943)** argued that the **closed interior of Eurasia** is the natural seat of world power. **Nicholas John Spykman (1942, 1944)** replied that power is decided in the **coastal ring** around it.
- Both read history as a contest of **land power and sea power**, a contrast that begins with **Alfred Thayer Mahan's sea power thesis** of 1890.
- The models survive because the wars and corridors of 2026 still fall on the **gateway** Mackinder named and the **rim** Spykman named, though neither model explains them alone.

## 01 Geopolitics and the Land–Sea Contest

- The term *Geopolitik* was coined by the Swedish political scientist **Rudolf Kjellén** in 1899. Its German form turned into a programme of expansion, the doctrine of **Lebensraum**.
- Thinkers in this tradition treat political history as shaped by **geographical causation**: location, accessibility and resources set the limits within which states act.
- **Sea power** rests on **long coasts, ports, shipping** and cheap movement. India, with its long coastline, is the regional case.
- **Land power** rests on **interior position**, contiguous territory and overland mobility. Land-locked Nepal is the extreme case on a small scale.

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- **Mahan** held sea power to be superior. **Mackinder** offered the antithesis: **railways were ending the age of naval advantage**.

## 02 Mackinder's Heartland Theory PYQ 2024 · 2020 · 2017 +4

### The Pivot Area, 1904 PYQ 2020

- **Mackinder (1861–1947)**, whose career belongs to the **British school**, read "**The Geographical Pivot of History**" at the Royal Geographical Society on **25 January 1904**. It appeared in *The Geographical Journal* that April.
- **Assumptions:**
  - Land and sea power are the two great forms of mobility, and history is their contest.
  - Geography is more measurable and more nearly constant than the human factors in power.
  - The closed political system of the post-exploration world means any shift of power is now felt everywhere.
- **Mechanism:**
  - The **Columbian epoch** of about 400 years, in which Europe expanded by sea against little resistance, ended soon after 1900.
  - From the 5th to the 16th century, **steppe horsemen** (Huns, Avars, Magyars, Mongols and others) pressed on the settled margins. That pressure helped forge Europe.
  - **Euro-Asia** measures about 21 million square miles. Its centre and north, about 9 million, have **no waterway to the ocean**: the Volga, Oxus and Jaxartes end in salt lakes, and the Obi, Yenisei and Lena in the frozen Arctic.
  - **Transcontinental railways** now give that interior the mobility once held by the horse and camel, in an area "inaccessible to ships".
- He called the area the **pivot** and also used the word "heart-land" in 1904; "Heartland" became the formal name in 1919.

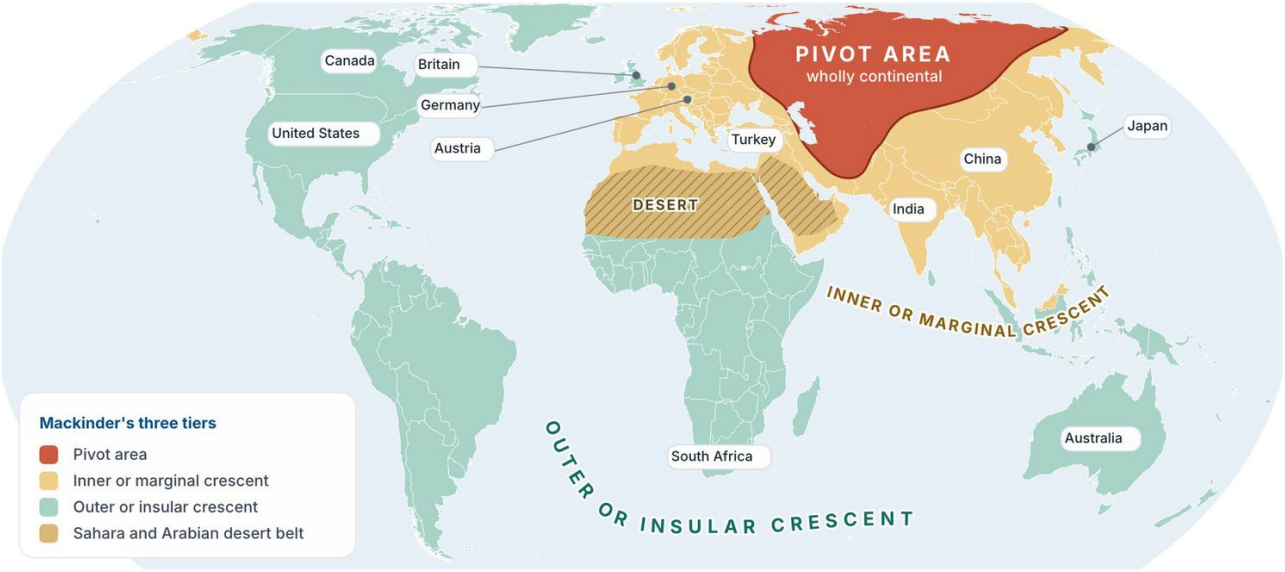
| TIER | CHARACTER | EXTENT | STATES HE NAMED |
|---|---|---|---|
| **Pivot area** | Wholly continental | Volga to eastern Siberia, Arctic to the Central Asian highlands, with the Iranian upland | Russia |
| **Inner or marginal crescent** | Partly continental, partly oceanic | Coastlands draining to navigable seas: Europe, Nearer East, monsoon Asia | Germany, Austria, Turkey, India, China |
| **Outer or insular crescent** | Wholly oceanic | Lands beyond the seas | Britain, South Africa, Australia, United States, Canada, Japan |

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MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## Mackinder's Natural Seats of Power, 1904

Halford Mackinder divided the world into a closed interior, a coastal ring around it and an island ring beyond, and argued that the balance was tilting toward the interior.




**Pivot area**
Inner Eurasia drained to the Arctic or to inland seas: closed to ships, open to horsemen and, by 1904, to railways. Held by Russia.

**Inner or marginal crescent**
Germany, Austria, Turkey, India and China: coastlands that are partly continental and partly oceanic, and open to sea power.

**Outer or insular crescent**
Britain, South Africa, Australia, the United States, Canada and Japan: wholly oceanic bases beyond the seas.

Schematic: zones traced onto a modern base from Mackinder's 1904 map "The Natural Seats of Power" and his list of states. Base map: Natural Earth.

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- **Outcome:**
  - The danger was an **oversetting of the balance** toward the pivot state. Its expansion over the margins would allow "the **use of vast continental resources for fleet-building**, and the empire of the world would then be in sight".
  - That could come from a **Germany allied with Russia**, or from a Chinese force organised by Japan overrunning Russia.
  - The sea powers would answer through **bridgeheads** in France, Italy, Egypt, India and Korea. Mackinder asked whether this was the strategic function of **India** in the British imperial system.
- **Marginal lands:** he saw four, matching four great religions: the Pacific and Indian monsoon lands (Buddhism, Brahminism), Europe (Christianity) and the Nearer East (Islam), the last being the weakest spot in the girdle.
- **India in 1904:** a monsoon land of the inner crescent, open to the sea on three sides. Britain held it by sea and feared Russian pressure toward its north-west passes.

## The Strategic Heartland, 1919

- ***Democratic Ideals and Reality*** (1919) was a **peace-time warning** to the statesmen at Versailles.

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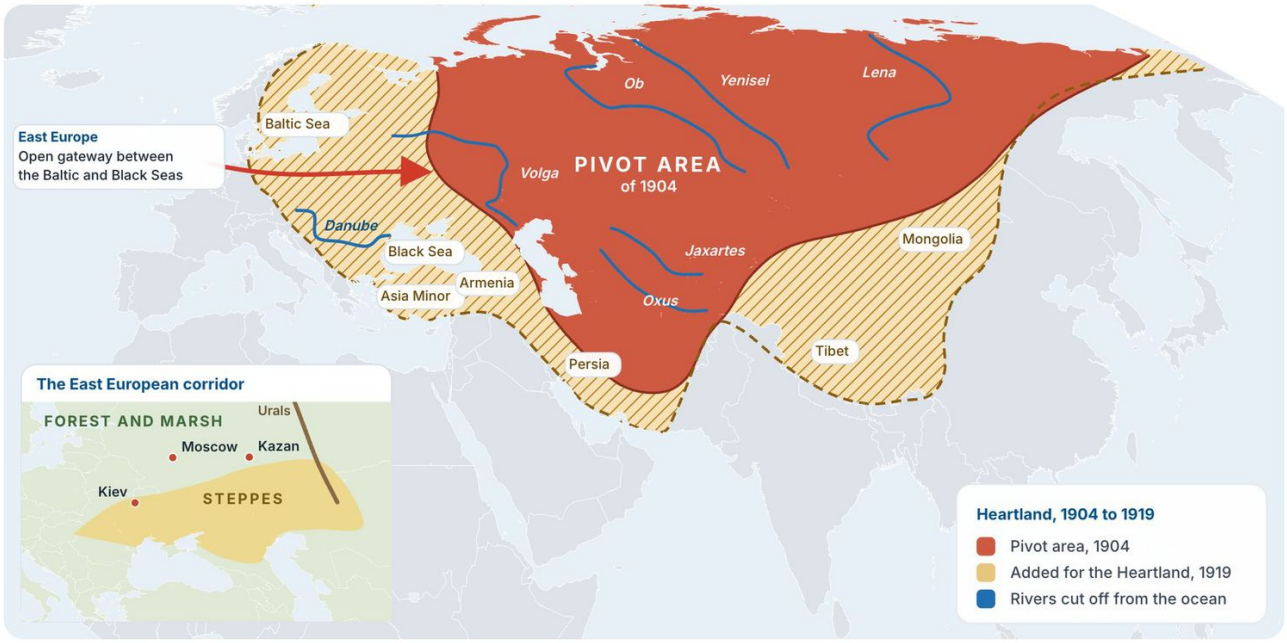
- **Why he changed the model:**
  - In the Great War, **land power closed the Baltic and the Dardanelles** to the fleets, so drainage alone no longer marked the limit of sea power.
  - Germany's bid in East Europe showed that an organiser from outside the old pivot could reach for it. The revolution in Russia left the interior open.
- **New definition:** the Heartland is "the region to which, under modern conditions, sea-power can be **refused access**", though its west lies outside Arctic and continental drainage.
- **New extent:** it "includes the Baltic Sea, the navigable Middle and Lower Danube, the Black Sea, Asia Minor, Armenia, Persia, Tibet, and Mongolia". Brandenburg-Prussia and Austria-Hungary now lay inside it.
- **World-Island:** Europe, Asia and Africa form one Great Continent. It covers **two-twelfths of the globe** against nine-twelfths of ocean and one-twelfth of other land, and holds more than **fourteen-sixteenths of humanity**.
  - That makes it about two-thirds of the land and **seven-eighths** of the people. Africa south of the Sahara became a **Southern Heartland**, and the Americas and Australia became satellites.
- **The gateway:** the plain between the Baltic and Black Seas is the **weak side of the fortress**. Its steppe corridor, between the forest to the north and the Black Sea and Caucasus to the south, carried the invasions of the past.
- **The strategic argument:** the Heartland is the strongest natural fortress on earth, with the resources of a trans-continental area. Any power that organised it effectively could found a world empire.
- **India in 1919:** the added plateau of Tibet overlooks the upper valleys of the Indian rivers, and he traced the north-west entries to India from the interior. The limit runs along the Himalaya, so the subcontinent stays outside.
- **The dictum**, in his words:
  - "Who rules East Europe commands the Heartland: Who rules the Heartland commands the World-Island: Who rules the World-Island commands the World."
- **Prescription:** a **Middle Tier** of independent states from the Baltic to the Adriatic and Black Seas, to **keep Germany and Russia apart**.

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MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## From Pivot to Strategic Heartland, 1919

Democratic Ideals and Reality kept the closed interior of 1904, then added the basins of the Baltic and Black Seas and the high plateaux of Persia, Tibet and Mongolia.




**A strategic test, not a drainage test**

The 1919 Heartland is the region to which, under modern conditions, sea power can be refused access, though its west lies outside Arctic and continental drainage.

**Why it grew**

- The Great War showed land power closing the Baltic and the Dardanelles to fleets
- Brandenburg-Prussia and Austria-Hungary now lay inside, with Russia

**The gateway becomes the key**

Who rules East Europe commands the Heartland: Who rules the Heartland commands the World-Island: Who rules the World-Island commands the World.

Schematic: limits traced from Mackinder's Fig. 5 (1904) and Fig. 24 (1919) and his list of included regions; rivers generalised. Base map: Natural Earth.

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## The Round World and the Midland Ocean, 1943

- **"The Round World and the Winning of the Peace"** (*Foreign Affairs*, July 1943) was written at the age of 82, four years before his death. It **extended the model rather than reversing it**: he called the Heartland **"more valid and useful** today than it was either twenty or forty years ago".
- **Heartland trimmed:** the USSR west of the **Yenisei**, with about 4.25 million square miles and over 170 million people. It was "the **greatest natural fortress on earth**", and for the first time "manned by a garrison sufficient both in number and quality".
- **Lenaland:** Soviet land east of the Yenisei, rugged and forested, with 3.75 million square miles and only about 6 million people. It now formed part of the fortress wall.
- **Midland Ocean:** the North Atlantic with the Mediterranean, Baltic, Arctic and Caribbean. Mackinder had seen the west of Europe and the east of North America as **physical complements** since the 1920s. He now gave the concept three elements:
  - a **bridgehead** in France;
  - a **moated aerodrome** in Britain;

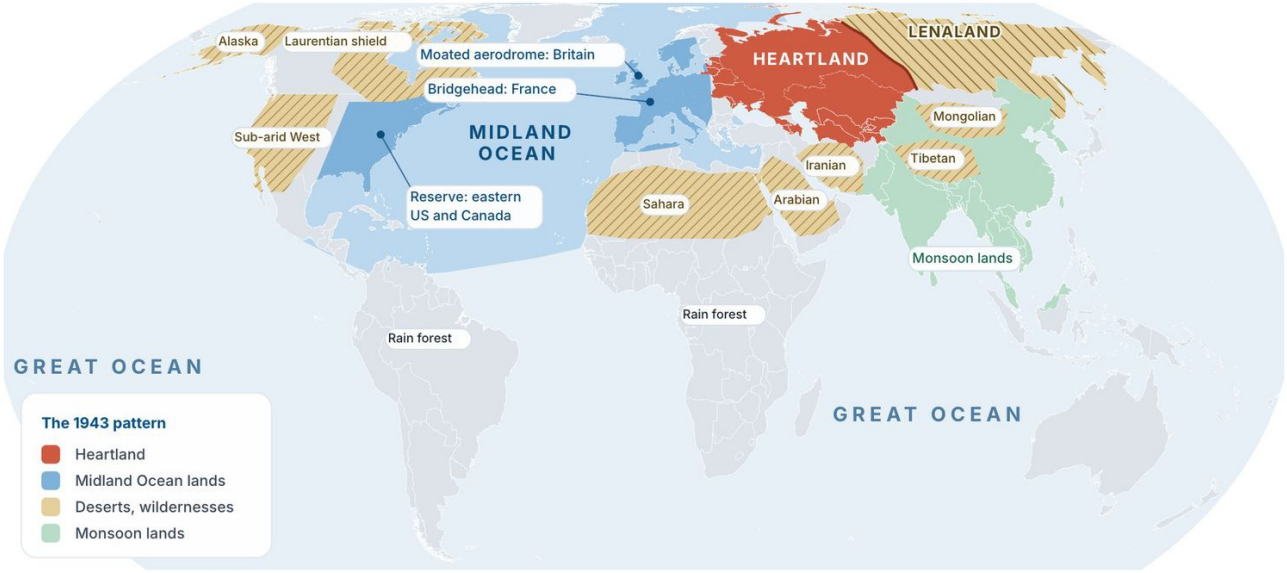
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  - a **reserve** of manpower, farming and industry in eastern North America.
- **Girdle of deserts and wildernesses:** from the Sahara through the Arabian, Iranian, Tibetan and Mongolian deserts to Lenaland, Alaska, the Laurentian shield and the sub-arid western United States. It would long "**break social continuity**" between the major communities.
- **Outer pattern:** the Great Ocean lands, the tropical rain forests, and a thousand million people in the **Monsoon lands of India and China**, who must grow to prosperity for a "**balanced globe**". India thus enters his last scheme as a future weight, no longer as a bridgehead.

MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## The Round World: Heartland and Midland Ocean, 1943

In his last paper Mackinder cut Lenaland from the Heartland and set a North Atlantic community against it, with a girdle of empty land around both.




### Heartland, trimmed

West of the Yenisei: 4.25 million square miles and over 170 million people. "The greatest natural fortress on earth", now with a garrison sufficient in number and quality.

### Midland Ocean, the counterweight

The North Atlantic with the Mediterranean, Baltic, Arctic and Caribbean: a bridgehead in France, a moated aerodrome in Britain and a reserve in eastern North America.

### The girdle and beyond

A mantle of vacancies, about a quarter of the land, breaks continuity. Outside it lie the Great Ocean lands, with a thousand million people in the Monsoon lands of India and China.

Schematic: traced from "The Round World and the Winning of the Peace" (Foreign Affairs, July 1943). Soviet territory shown on modern boundaries. Base map: Natural Earth.

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| VERSION | CORE | LIMIT | COUNTERWEIGHT | CONTEXT |
|---|---|---|---|---|
| **1904** | Pivot area | Arctic and inland drainage | Crescent bridgeheads | Railways; Russo-British rivalry |
| **1919** | Heartland | Region closed to sea power; Baltic and Black Sea added | Middle Tier; League of Nations | Versailles; German-Slav contest |

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| VERSION | CORE | LIMIT | COUNTERWEIGHT | CONTEXT |
|---|---|---|---|---|
| **1943** | Heartland less Lenaland | USSR west of the Yenisei | Midland Ocean | Soviet resistance; coming peace |

## Applying the Model

| PERIOD | EVENTS | READING |
|---|---|---|
| **To 1945** | Karl Haushofer's **German Geopolitik** drew on the thesis; Nazi-Soviet pact (1939); invasion of the USSR (1941) | A Germany-Russia combination, then a bid to seize the gateway; the garrison held |
| **Cold War, 1945–91** | Soviet control of East Europe; US-UK Atlantic alliance; Cuban Missile Crisis (1962), a response to US missiles near Soviet soil | Heartland against Midland Ocean, the two centres of 1943 |
| **Indian Ocean after empire** | Britain lost Suez (1956) and left east of Suez by 1971; US bases followed, as at Diego Garcia | Outside powers entered the crescent to balance the Heartland power |
| **After 1991** | Soviet collapse; a unipolar moment; Shanghai Cooperation Organisation (2001); BRICS | Heartland broken up, yet Russia kept its arms and alignments; a shift to many poles |

- **West Asia in the Cold War:** the crescent's oil and transit position drew both blocs. The USSR backed Iraq and later intervened in Afghanistan, while the United States aligned with Saudi Arabia and Israel.
- **The dictum tested:** by 1945 Moscow ruled East Europe and the Heartland, yet it never commanded the World-Island. Containment from the rim and a weak civilian economy stopped it.

## Criticism

- **Determinism:** history is **reduced to land against sea**, and to geography. Physical, economic and cultural forces all act, and human technology overrides terrain, as possibilists argue.
- **Area is not power:** he **inflated the interior**'s resource and power potential. Much of it is cold or arid waste that cannot feed a large population, and it is ringed by ice and mountains.
- **Outdated technology:** he wrote as the rail age peaked and the air age began. Fighters and missiles **leave the fortress open** from all sides, and nuclear deterrence changed the calculation.
- **Flat-map thinking:** critics charge him with a **Mercator-style image** of a vast Arctic gap. North America and Siberia in fact face each other across the Bering Strait and the polar route. His own 1904 maps were on an equal-area base, and "the round world" of 1943 answers part of this charge.
- **Unused potential:** the Heartland has **never organised itself** into world dominion, and Soviet power collapsed.
- **Tainted use:** the thesis fed Geopolitik, and geopolitics migrated from Germany to North America after 1945.

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- **A defence:** W. H. Parker (1982) tested about a hundred such criticisms and found many rest on misreading. Mackinder himself said the concept could not be precisely mapped.

## 03 Spykman's Rimland Theory

PYQ 2026 · 2019 · 2004 +1

### Author and Premises

- **Nicholas John Spykman (1893–1943)** was a Dutch-born American scholar who founded the Yale Institute of International Studies in 1935.
- ***America's Strategy in World Politics*** **(1942)** judged power from the US position: America is **surrounded by the Old World**, so its security needs a balance of power in Europe and the Far East.
  - Six months before Stalingrad he warned that "a Russian state from the Urals to the North Sea can be no great improvement over a German state from the North Sea to the Urals".
- ***The Geography of the Peace*** **(1944)** appeared after his death in June 1943 and set out the Rimland map.
- **Premises shared with Mackinder:** geographical causation and the land-sea contest. National power is the final guarantee of security, and lasting peace needs a balance of power or an armed league.

### The Two Tiers

| TIER | SPYKMAN'S VIEW |
|---|---|
| **Heartland (inner core)** | Extreme climate; farming centred in the west, not Siberia; little arable land; rivers, mountains and distance hinder movement. A power centre only in the distant future, and not sealed, since steppes and valleys give access |
| **Rimland** | Mackinder's inner crescent renamed: an **amphibious buffer** between land and sea power, with most of the people and resources, which must defend itself on both sides |

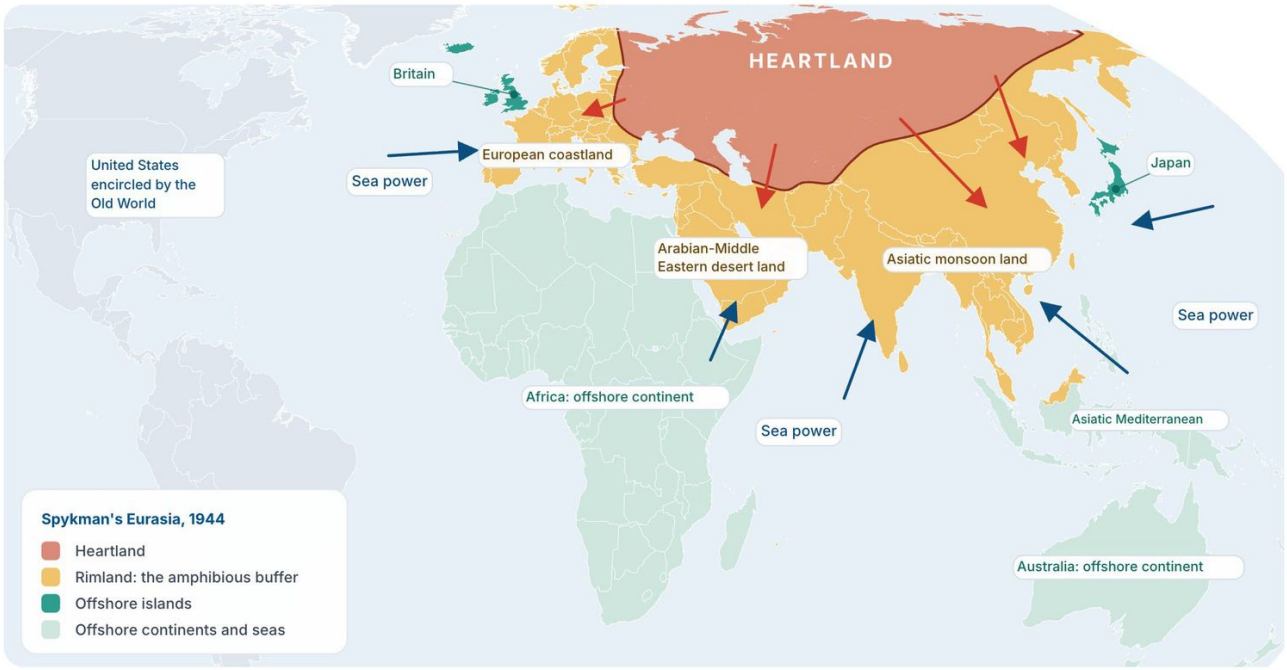
- **Three sections:** the **European coastland**, the **Arabian-Middle Eastern desert land** and the **Asiatic monsoon land**, the last holding India and China.
- **Beyond the rim:** the offshore islands of Britain and Japan, the offshore continents of Africa and Australia, and the sea lanes that link them.
- **The reply**, recast from Mackinder's slogan:
  - "Who controls the rimland rules Eurasia; who rules Eurasia controls the destinies of the world."
- **The logic:** the Heartland appeared **less important than the Rimland.** Spykman argued that a combination of land and sea powers holding the rim would command the essential power relations of the world. The US aim was therefore to prevent any **unification of the Rimland** by a hostile power.
- **Maritime mobility:** the overseas empire is a new kind of structure, unlike land empires built on contiguous territory. Sea power lets Eurasia be conceived as a unit, and it governs relations between the Old and New Worlds.
- **Terrain and policy:** topography, terrain and climate are treated as basic conditions of foreign policy because they change least.

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MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## Spykman's Rimland, 1944

Nicholas Spykman moved the pivot of world politics from the Eurasian interior to the coastal ring, which land power presses from within and sea power from without.




**Heartland marked down**
Cold, arable only in the west and short of communications: Spykman saw no basis for treating it as a centre of mobility and power potential in the near future.

**Rimland as the prize**
An intermediate region, pressed from both sides, with most of the people and resources. It must fight land power and sea power at once.

**The reply**
Who controls the rimland rules Eurasia; who rules Eurasia controls the destinies of the world. No single power should be allowed to unify it.

Schematic: limits traced from the description in Spykman's The Geography of the Peace (1944) and Mackinder's inner crescent. Base map: Natural Earth.

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## Applications

- **Containment:** with Germany defeated and the USSR sole master of the Heartland, the logic matched US policy after George F. Kennan's 1947 article.
  - A **chain of pacts** ringed the Soviet Union: **NATO (1949), ANZUS (1951), SEATO (1954)** and the **Baghdad Pact (1955)**, later CENTO. The domino theory followed the same reasoning.
- **Wars on the rim:** Korea, Vietnam, the Sino-Indian War, the Arab-Israeli and Indo-Pakistani wars, the Gulf wars, Afghanistan and Iraq were all fought there.
- **Regional bodies:** ASEAN, the Indian Ocean Rim Association and BIMSTEC seek to organise rim states, and the US rebalance to Asia and forums such as the Raisina Dialogue reflect the same interest.
- **India: K. M. Panikkar**, in *India and the Indian Ocean* (1945), wrote that "whoever controls the Indian Ocean has India at his mercy". His argument, built on Mahan, gives Rimland logic an Indian form, and it runs through **the geopolitics of the Indian Ocean and South Asia**.

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### Oil as a Geopolitical Weapon PYQ 1994

- West Asia's oil shows how much of the rim's value lies in resources. In **1973** Arab producers cut output and embargoed the United States and others over support for Israel, and prices surged.
- The weapon has limits: buyers built reserves and pipelines, and Gulf states need the revenue. **US crude output** rose from 5.2 to 13.6 million barrels a day between 2005 and 2025.
- Gulf producers still supplied about **28% of world oil** in 2025. The 2026 **energy crisis** moved the lever from the producer's tap to **control of the passage** at Hormuz.

### Criticism

- War technology and nuclear deterrence weaken any claim for a decisive zone.
- Spykman underrated the **United Nations** and world opinion. International law bars conquest, and the organic state of **Friedrich Ratzel** has no legal footing now.
- **Economic dependence** now does much of the work once done by territorial control.
- The **rim is not one unit**: its states pursue their own aims and rival one another, as India and China do.
- It is a US-centred prescription as much as a theory, and it cannot explain wars that have no great-power contest behind them.

### Why the Rim Weighs More

- **Most of humanity**, and the great consumers and exporters of energy, live on the rim: India, China, the Gulf and Southeast Asia.
- **Modern trade moves by sea**, which favours coastal over interior positions.
- **Most wars, terror networks** and proliferation disputes since 1950 have lain within it.
- Many of its developing economies are the fastest-growing markets, as with India and the CLMV countries.

## 04 Comparison and Later Views

### The Two Models Compared

| POINT | MACKINDER | SPYKMAN |
|---|---|---|
| **Key years** | 1904, 1919, 1943 | 1942, 1944 |
| **Pivot of power** | Closed interior | Coastal ring |
| **Decisive form of power** | Land, by rail | Land and sea combined on the rim |
| **View of Siberia and Central Asia** | Fortress with vast resources | Harsh and thinly peopled; limited near-term power |

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| POINT | MACKINDER | SPYKMAN |
|---|---|---|
| **Worry** | Interior power gains the coasts and a fleet | One power unifies the rim |
| **Standpoint** | British Empire and post-war Europe | United States in a balance of power |
| **Slogan begins with** | East Europe | Rimland |
| **Policy legacy** | Buffer states; Atlantic community | Containment and alliance chains |

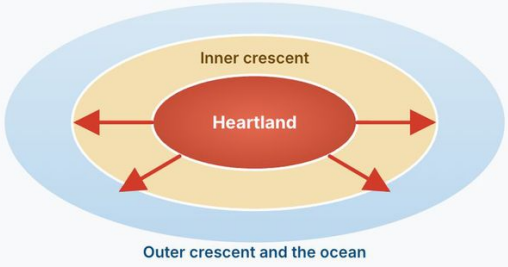
MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## Heartland and Rimland Compared

The two models share a map and a framing, but they read the same ring in opposite ways: Mackinder as the periphery of the fortress, Spykman as the seat of decision.

### Mackinder: power flows out from the core

1904, 1919: land power commands




East Europe → Heartland → World-Island → World

Control of the gateway leads to control of the core, then of the land mass

### Spykman: power is decided in the ring

1942, 1944: whoever holds the rim holds Eurasia




Rimland → Eurasia → Destinies of the world

Control of the coastlands leads to control of the land mass

**Common ground**

- Geography conditions the power of states
- The contest is framed as land power against sea power
- Eurasia is the stage on which world power is decided

**Where they part**

- Interior strength against coastal strength
- Mackinder warns the sea powers; Spykman advises them
- Rim as bridgehead against rim as the prize itself

**What both underrate**

- Air power, missiles and nuclear deterrence
- Economic interdependence and institutions
- Peoples and states with aims of their own

Schematic: conceptual diagram based on Mackinder (1904, 1919) and Spykman (1942, 1944). Not to scale. lotusarise.com

## India in the Two Models

| THINKER | PLACE GIVEN TO INDIA | WHAT FOLLOWS |
|---|---|---|
| **Mackinder, 1904** | Inner crescent; a possible bridgehead for the sea powers | Value lies in its position for others |

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| THINKER | PLACE GIVEN TO INDIA | WHAT FOLLOWS |
|---|---|---|
| **Mackinder, 1943** | Monsoon lands, with China, as a future balance | Value lies in its own numbers and growth |
| **Spykman, 1944** | Centre of the Asiatic monsoon land, jutting into the Indian Ocean | Pressed from land and sea; a prize of the rim |
| **Panikkar, 1945** | The ocean decides India's freedom | India must hold its own sea approaches |

- **India's double face:** it looks **inland** through the Shanghai Cooperation Organisation and the North-South Corridor, and **seaward** through the Quad and MAHASAGAR. No single model describes this.
- **Neighbours as examples:** Pakistan denies India overland transit, which is why Chabahar matters. The China-Pakistan Corridor at Gwadar and the ports at Hambantota and Kyaukphyu bring a rival onto India's own rim. Such rivalries are one strand of **political geography**, and their detail lies with each neighbour.

## Later Views

| THINKER | WORK AND YEAR | IDEA |
|---|---|---|
| **Alexander P. de Seversky** | *Victory Through Air Power* (1942); *Air Power: Key to Survival* (1950) | A polar azimuthal map with circles of US and Soviet air dominance overlapping in an **area of decision** around the Arctic and North America |
| **Saul Bernard Cohen** | *Geography and Politics in a World Divided* (1963); *Geopolitics of the World System* (2003) | **Geostrategic realms**, first maritime and Eurasian continental, later with East Asia, over geopolitical regions; **shatterbelts** such as the Middle East; **gateway** states as links |
| **Zbigniew Brzezinski** | *The Grand Chessboard* (1997) | Eurasia remains the prize; US primacy depends on keeping it from a single challenger |
| **Critical geopolitics** | 1990s onward | Asks how such maps justify power, rather than treating them as neutral |

- **De Seversky** answers the charge that no one looked north: **the Arctic becomes a new Mediterranean** between the two powers. Policy makers largely kept the Rimland alliances all the same.
- **Cohen rejects any single key area.** By 1990 he held that the Heartland, Rimland and polar theories of world dominance had been overtaken, and he placed **South Asia** in an arc of geostrategic instability with India as a rising regional power.

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# 05 The Present Geopolitical Scenario, October 2026

PYQ 2026 · 2024

## The Gateway and the Interior

- **Russia-Ukraine:** the war since February 2022 is a **struggle over Mackinder**'s gateway. Russia holds about **a fifth of Ukraine**, but gained only about 0.3–0.4% more in the year to September 2026. It still demands that NATO return to its 1997 limits. A local truce at Oleshky held in late October, with US-brokered talks promised for November.
- **NATO's new rim:** Finland (2023) and Sweden (2024) have joined, which turns the Baltic into a nearly allied sea.
- **The organiser's limits:** Russia now sends nearly half its crude exports to China. The Power of Siberia 2 pipeline stayed without a deal at the Shanghai Cooperation Organisation summit in Bishkek (31 August–1 September 2026), and China has overtaken Russia as Central Asia's largest direct investor. The strongest power in the interior is now a **dependent partner of a rim state**.
- **Corridors across the Heartland:** railways are again the argument.
  - The **Belt and Road** runs rail links from China to Europe. The China-Kyrgyzstan-Uzbekistan railway is under way.
  - The **Middle Corridor** bypasses Russia, though it carried only 4.12 million tonnes in 2025, down from 4.48 million in 2024. The World Bank (2026) expects investment to more than triple its trade by 2040, yet this remains a small fraction of China-Europe tonnage by sea. The planned **TRIPP** route through southern Armenia gives the United States a stake in the Caucasus.
  - The **International North-South Transport Corridor** links India to Russia through Iran, but India's **role** at **Chabahar** is in doubt since the US waiver lapsed on 26 April 2026.
- **The Arctic:** the Northern Sea Route and China's 20% stake in Arctic LNG 2 bring the area of decision back in a new, commercial form.

## The Rim

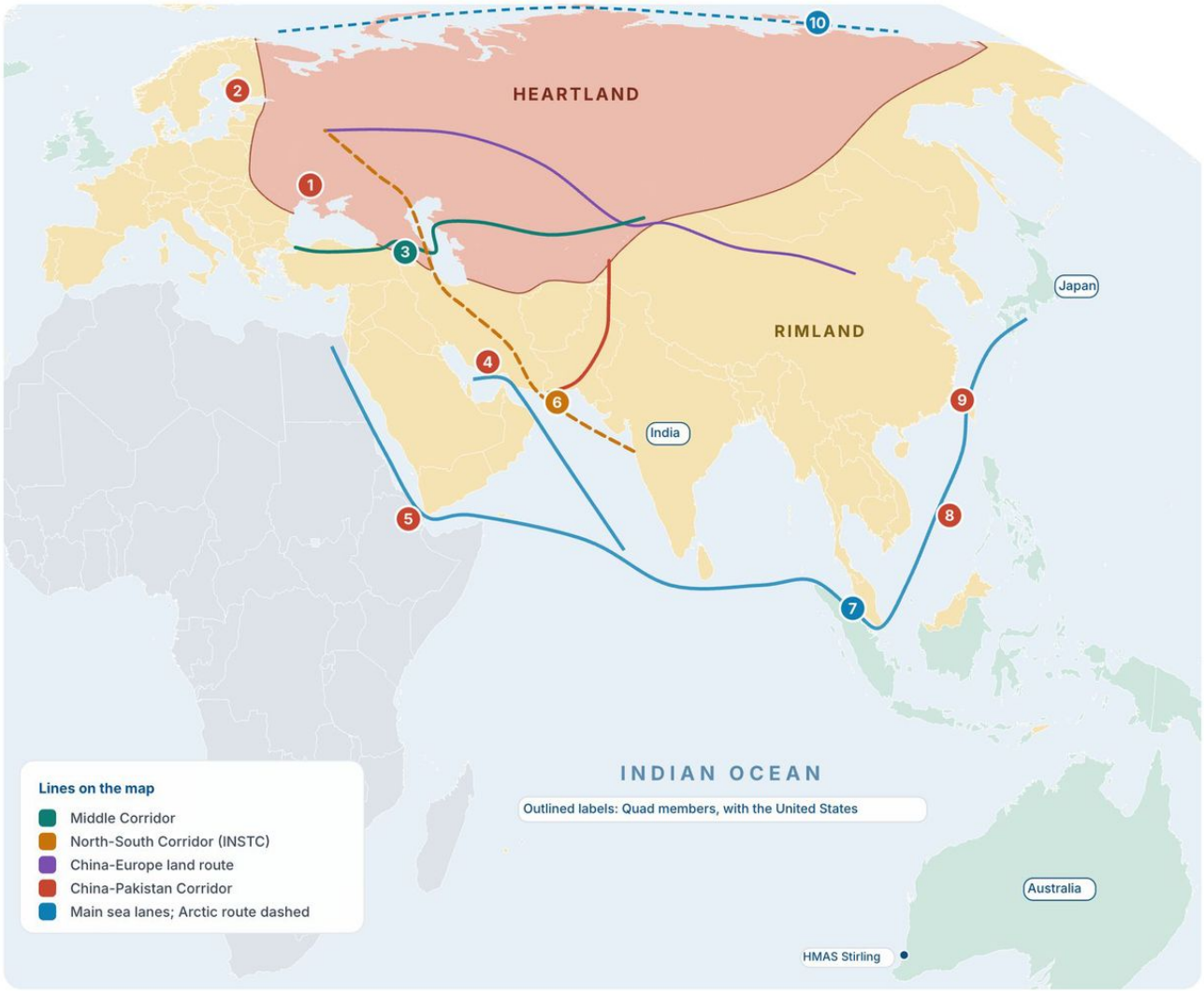
- **Hormuz and the Iran war:** the war began on 28 February 2026. In October, **tanker crossings averaged about 14** a day against a pre-war 50, the IMO logged 29 attacks in three weeks, and Brent stood near **$115**. Iran calls the strait closed, while US forces blockade Iranian ports and call the lanes clear.
- **Red Sea:** Suez traffic is recovering but its tonnage remains about **36% below** pre-crisis levels. No attack on shipping has been reported there since 24 August, though Houthi strikes on Saudi Arabia continue.
- **Western Pacific:** China and the Philippines **clashed at Second Thomas Shoal** and Scarborough Shoal in July 2026, and the US and Japan joined Manila in drills.
- **Rim alliances:** the Quad's foreign ministers met in New Delhi in May 2026, and a leaders' summit is promised for Manila in November. **AUKUS** was affirmed after a US review in December 2025, with rotational submarines due in Western Australia from 2027.
- **India:** it sits on the rim and **hedges across it**, in the Quad and the Shanghai Cooperation Organisation at once. Its **international boundaries** with Pakistan and China stay contested.

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MODELS, THEORIES AND LAWS · HEARTLAND AND RIMLAND

## Eurasia and the Indo-Pacific, October 2026

The live contests sit where the old models said they would, on the gateway and the rim, while new corridors cross the interior and the Arctic opens a third front.




### The western gateway

- **1** Ukraine: Russia holds about a fifth; talks due in November 2026
- **2** Finland (2023) and Sweden (2024) in NATO close the Baltic rim
- **3** South Caucasus: TRIPP and the Middle Corridor bypass Russia and Iran

### The southern rim

- **4** Hormuz: contested since 28 February 2026
- **5** Bab-el-Mandeb: carriers returning, risk unresolved
- **6** Chabahar: US waiver lapsed on 26 April 2026

### The eastern rim and Arctic

- **7** Malacca: largest oil chokepoint
- **8** South China Sea: clashes at Second Thomas and Scarborough, July 2026
- **9** Taiwan Strait **10** Northern Sea Route, with China and Russia

Status as of 30 October 2026, from ISW, Kpler, Lloyd's List Intelligence, EIA and official statements. Corridors and the Heartland-Rimland limit are schematic. Base map: Natural Earth.

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## Verdict

- **Mackinder's gain:** the gateway is again at war, and interior corridors matter. Yet the Heartland's master is weak, and no power is close to commanding the World-Island.

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- **Spykman's gain:** the richest economies, tightest chokepoints and most wars lie on the rim, and alliances still ring it. Yet the rim is plural, and its largest state, China, is both land and sea power.
- **What neither foresaw:** missiles, drones, sanctions, finance and supply chains. **Control over flows** now counts alongside control over land.
- **The lasting value** is the **habit of reading power spatially**, rather than any single formula.

## Summary

| CATEGORY | HEARTLAND | RIMLAND |
|---|---|---|
| **Author** | Halford John Mackinder | Nicholas John Spykman |
| **Works** | Pivot paper (1904); *Democratic Ideals and Reality* (1919); *The Round World* (1943) | *America's Strategy in World Politics* (1942); *The Geography of the Peace* (1944) |
| **Core** | Closed Eurasian interior | Coastal ring of Eurasia |
| **Main critique** | Determinism; technology; area is not power | Technology; law; the rim is not one unit |
| **Value today** | Ukraine, corridors, Arctic | Indo-Pacific, chokepoints, alliances |

## Previous Year Questions

| | |
|---|---|
| 2026 | Explain the Rimland Theory with reference to ongoing geopolitical scenario in the world. |
| 2024 | Explain the Heartland theory with reference to the contemporary geopolitical scenario of the world. |
| 2020 | Discuss how and why Mackinder modified his concept of Pivot Area after the World Wars. |
| 2019 | Examine the relevance of the 'rimland theory' in the contemporary world. |
| 2017 | "The Heartland Theory is gaining importance once again." Comment. |
| 2013 | Relevance of the Heartland theory in the contemporary world. |
| 2005 | Examine the Heartland theory, and assess its merits and demerits. |

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| | |
|---|---|
| 2004 | To what extent are the heartland and rimland theories helpful in understanding the world political situation today? Express your opinion clearly. |
| 2002 | Write short note: Rimland Theory. |
| 1994 | 'Oil has placed in the hands of Arab nations a tremendous geopolitical weapon with which they wield power'; Comment. |
| 1989 | Discuss in detail the Heartland concept of Mackinder and the criticism it has attracted in recent years. |
| 1988 | Write short note on Geopolitics. |

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