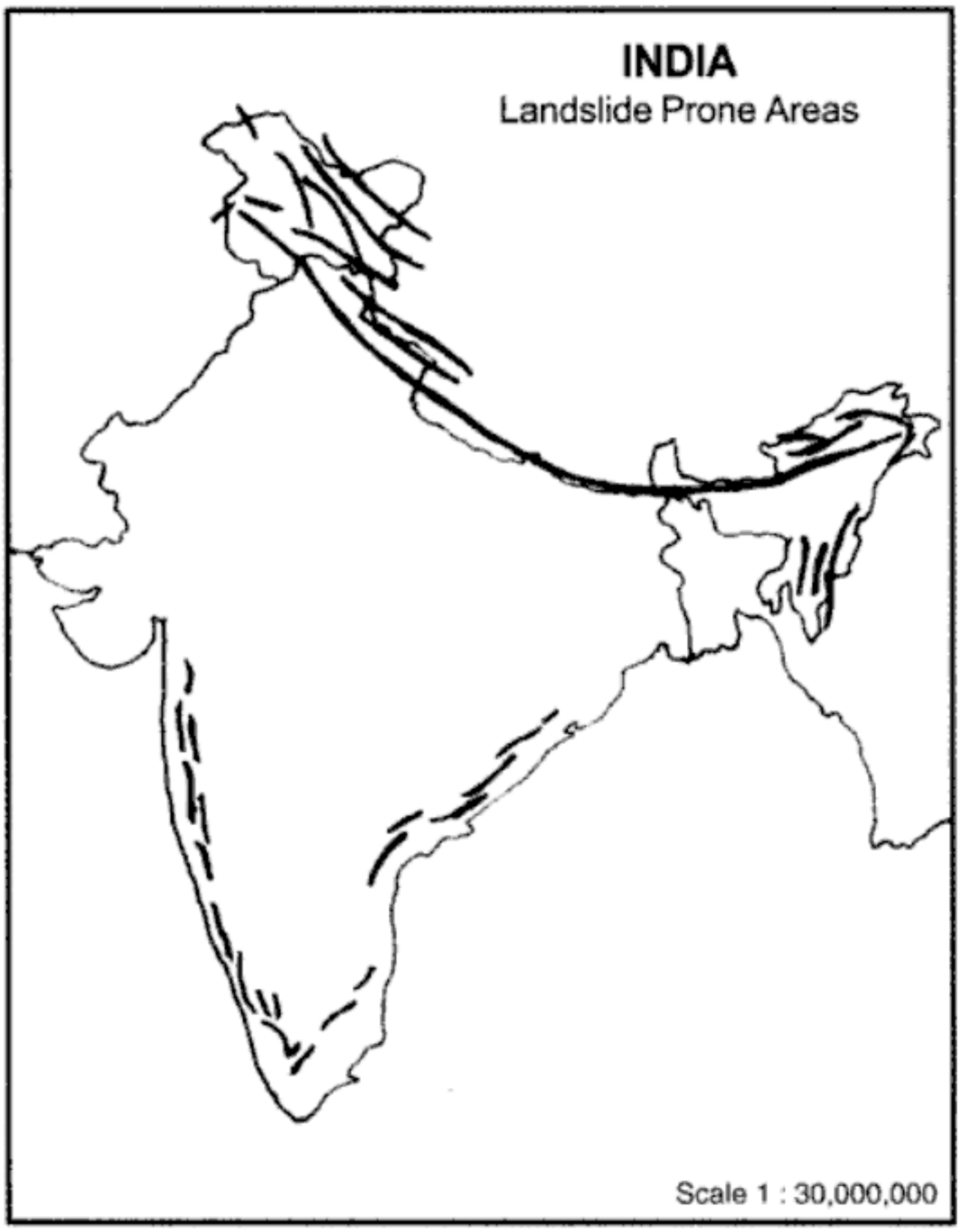

Fig. 17.2 Landslide Prone Areas

Earthquakes

Earthquakes are vibrations of earth caused by ruptures and sudden movements of rocks that have been strained beyond their elastic limits. In other words, 'an earthquake is a motion of ground surface ranging from faint tremor to a wild motion capable of shaking buildings apart.'

The main causes of earthquakes are: (i) movement of the plates of the earth crust (plate tectonics); (ii) volcanic eruptions; (iii) folding and faulting of rocks; (iv) landslides; and (v) anthropogenic factors.

The sudden displacement of the earth's crust releases energy stored within the earth's interior (crust and mantle). It causes tremors or waves which move in different directions from the centre of disturbance. These waves are similar to ripples in water or light waves. The centre from which the earthquake waves originate is called the *seismic focus*. The point vertically above on the earth's surface is called *epicentre* . Most of the earthquakes have focus at depths of less than 60 km. The focus of deepest earthquake ever recorded was at a depth of 70 km in the mantle. The intensity of the earthquake is maximum at the epicenter and decreases with distance from the epicenter.

Epidemics

The term *epidemic* originally denotes a sudden excessive prevalence of disease in a population. Epidemic means *'upon the people'*. Historically, epidemic was applied to infectious disease, but in more recent times, it also includes major non-infectious diseases, such as AIDS, and cancer, too.

Transmission

Epidemic diseases are transmitted in many ways. Some of the ways of their transmission are as under:

1. By direct contact, for example, droplets sprayed about when a patient coughs or sneezes
2. By contaminated food and water.
3. By arthropods—filth associated flies—of various types that may serve as mechanical carriers of disease germs as in dysentery and cholera. Blood-sucking arthropods like mosquitoes are more effective transmitters.

Factors Affecting Incidence

Apart from weather and climate, there are many factors which influence the spread and intensity of epidemics. Some of the factors are:

(i) ethnicity,
(ii) age and sex composition,
(iii) literacy and education,
(iv) occupation and lifestyle,
(v) standard of living,
(vi) size of family and degree of crowding,
(vii) residential locality,
(viii) food habits,
(ix) smoking and consumption of liquer, and
(x) association with animals and birds.

Incidence Curve

Incidence curve of different epidemic diseases are similar in that the rise in number of cases in an epidemic is usually more rapid than its fall .

ENVIRONMENTAL POLLUTION

A substance which causes an undesirable change in the physical, chemical, or biological characteristics of natural environment is known as pollution. Although there are some natural pollutants such as volcanoes, pollution generally occurs because of human activity. Biodegradable pollutants, like sewage, cause no permanent damage if they are adequately dispersed, but non-biodegradable pollutants, such as lead, may be concentrated as they move up the food chain. At present, air pollution—associated with basic industries such as oil refining, chemicals, iron and steel, and coal, as well as with internal combustion engine—is probably the principal offender, followed by water, and land pollution. Other forms of environmental pollution include noise and the emission of heat into waterways, which may damage aquatic life. Present day problems of pollution include acid rain and the burning of fossil fuels to produce excessive carbon dioxide.

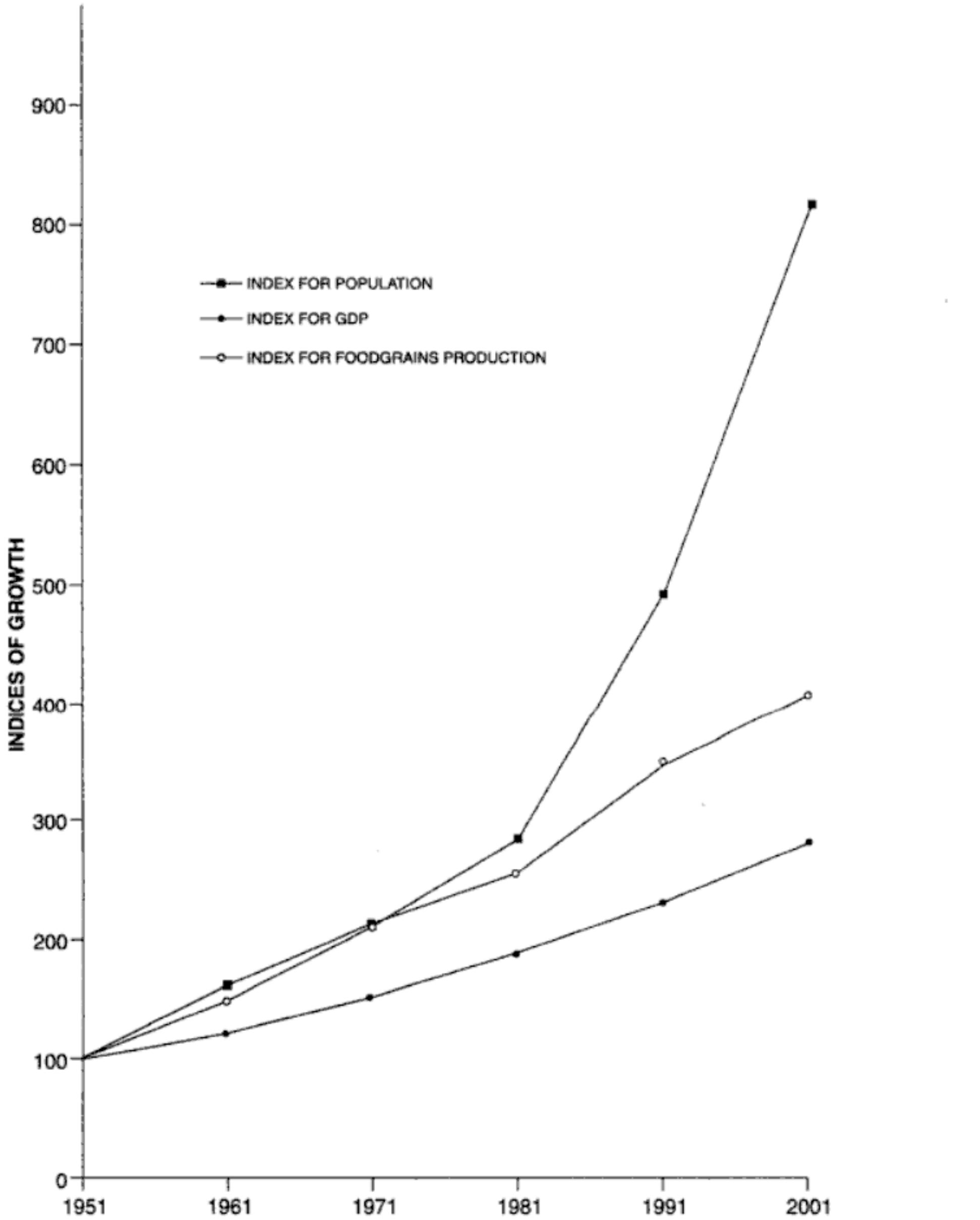

Fig. 17.8(a) Indices of Growth of Population, GDP and Foodgrains Production 1951 to 2001

The population explosion and the food security problems need to be tackled by taking the following steps:

(i) Delay in the marriageable age—21 years for bride and 24 years for bridegroom.
(ii) Implementation of strict two-child policy.

4. Disparity in Industrial Growth

As stated above, the initial distribution of industries was determined by the historical processes reflected in the development of transport facilities and the interest of the British rulers.

Thus, at the time of Independence, we inherited a lopsided pattern of industrial development with most of the industries concentrated at a few centres. After Independence, most of the industries remained concentrated in Gujarat and Maharashtra.

The states of Punjab and Haryana made tremendous progress in the agro-based industries after Independence. The per capita consumption of electricity was highest in Punjab, followed by Maharashtra and Gujarat. The under-developed states of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh remained way behind these states in industrial consumption of electricity.

5. Disparities in Agricultural Growth and Development

After the introduction of High Yielding Varieties of wheat and rice, the production and productivity has substantially increased in Punjab, Haryana, western Uttar Pradesh, Gujarat, and Tamil Nadu. The performance of agriculture is, however, much below in Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, and Rajasthan. The erratic and low performance of agriculture is affecting the standard of living of the people adversely.

6. Disparities in Private Investments

The flow of private investment , both domestic and foreign, has been extremely biased in favour of the more developed regions/states of the country because these regions were having better infrastructural facilities. The backward regions of the country, which were unable to attract any significant private investment flows, experienced decelerated economic growth during the post-Independence period. The poor infrastructure and the poor law and order in the backward states discouraged the private investors.

If the post-Independence trend of socio-economic development continues, India will be highly uneven nation in terms of quality of life. Income and standard of living will vary considerably across the country. People in most of the southern and western parts of the country will be enjoying fairly high per capita incomes, which may be comparable to those of middle income developed countries today. The literacy rate will be high and the gender difference will disappear. The situation will be just the reverse in the backward states.

Profile of Regional Disparities for Different Growth Scenarios—2025

The historical and the post Independence trends show that disparities are bound to increase in the coming decades. The backward regions have very weak growth impulses. The backward states like Bihar, Madhya Pradesh, Orissa, Rajasthan, and Uttar Pradesh have the demographic disadvantage. Because of fast growth of population in the backward states, employment opportunities, social sector investments, and the overall development can be very slow.

RELATIONSHIP BETWEEN POPULATION AND DEVELOPMENT

Population and development are closely interrelated. There are a number of population traits that influence developmental issues. In the same way, the developmental issues also affect the different traits of population. The ways by which population issues are affected also vary from region to

Percentage of Earth's History

Eon	*Era*	*Million Years*	*Percentage of Earth's history*
Ohanerozoic	[Cenozoic]		
	[Mesozoic]		
	[Paleozoic]	570	12.40 %
Precambrian	[Protozoic]		
	[Archean]	4600	87.60 %

1. Archaean Series

1. **The Chilpi Series**: Balaghat and Chhindwara districts of Madhya Pradesh.
2. **The Sausar Series**, spreading over Nagpur, Bhandara (Maharashtra), and Chhindwara (M.P.).
3. **The Sakoli Series (Gondite Series)**, lying in Jabalpur and Rewa districts.
4. **The Khondalite Series:** It occupies a large area of the Eastern Ghats and the upper Krishna Basin.
5. **The Iron Series:** Rich in iron ore, it is spread over Singhbhum (Jharkhand) Bonai, Mayurbhanj, and Keonjhar districts (Orissa).

2. Cuddapah Series

1. **The Papaghani Series:** Cuddapah District (Andhra Pradesh).
2. **The Cheyair Series** in the valley of Cheyair river.
3. **The Nallamala Series** (Nallamalai Hills).
4. **The Kistna Series** in the valley of Krishna river.
5. **The Cheyair Series** in the valley of Cheyair river.
6. **The Nallamalai Series** (Nallamalai Hills).
7. **The Bijwar Series:** Chhatarpur and Panna districts (Madhya Pradesh).
8. **The Gwalior Series** (Madhya Pradesh).
9. **The Rajpur Series:** Durg, Rajpur, Bilaspur (Upper Mahanadi in Chhattisgarh).
10. **The Kaldgi Series:** Bijapur District of Maharashtra.
11. **The Pakhal Series:** Penganga Basin.
12. **The Ajabgarh Series:** Rajasthan.
13. **The Rialo Series:** Delhi–Alwar Series.

3. Vindhyan Series

1. **The Semri Series:** Son Valley.
2. **The Kurnool Series:** Kurnool District—Andhra Pradesh
3. **The Bhima Series:** Gulbarga and Bijapur districts (Karnataka)
4. **The Malani Series:** Malani region—Jodhpur–Rajasthan
5. **The Kaimur Series:** Western part of the Chhotanagpur Plateau
6. **Rewa Series:** Panna District—Madhya Pradesh
7. **Bhander Series:** Spread over the western part of the Vindhyan Range.

4. The Palaeozoic Group

1. **Tanawal Series** in Kashmir
2. **Jaunsar** Series in Shimla–Garhwal region

(*Contd.*)

1991	84,33,87,888 (843M)	16,30,58,791 (163M)	2.38	2.14	176	4.6
2001	10,20,15,247 (1027 M)	18,36,27,359 (183)	2.13	1.93	209	2.40