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World Model

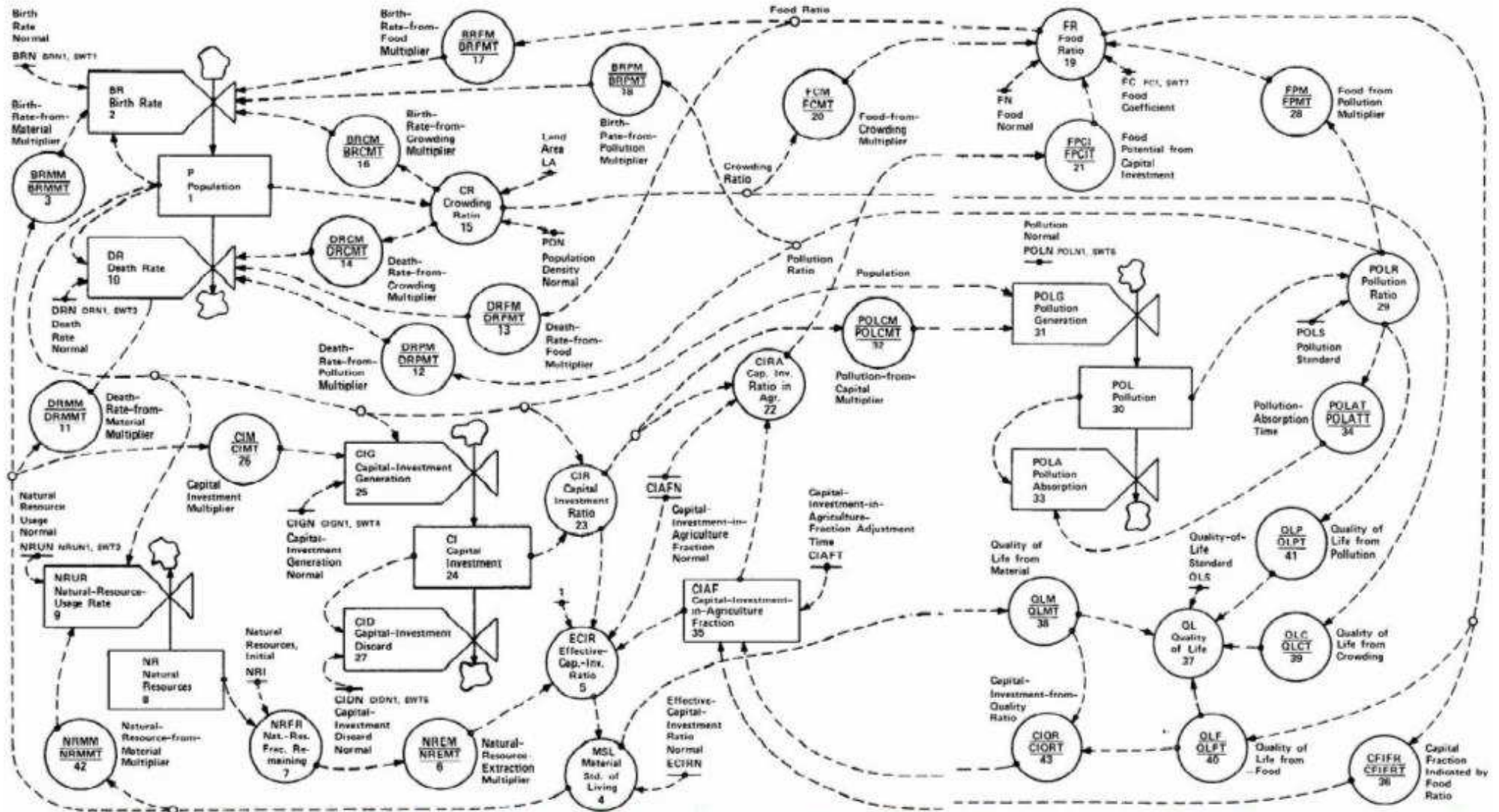


Fig. 1 This world model is a beginning basis for analyzing the effect of changing population and economic growth over the next 50 years. The model includes interrelationships of population, capital investment, natural resources, pollution, and agriculture.

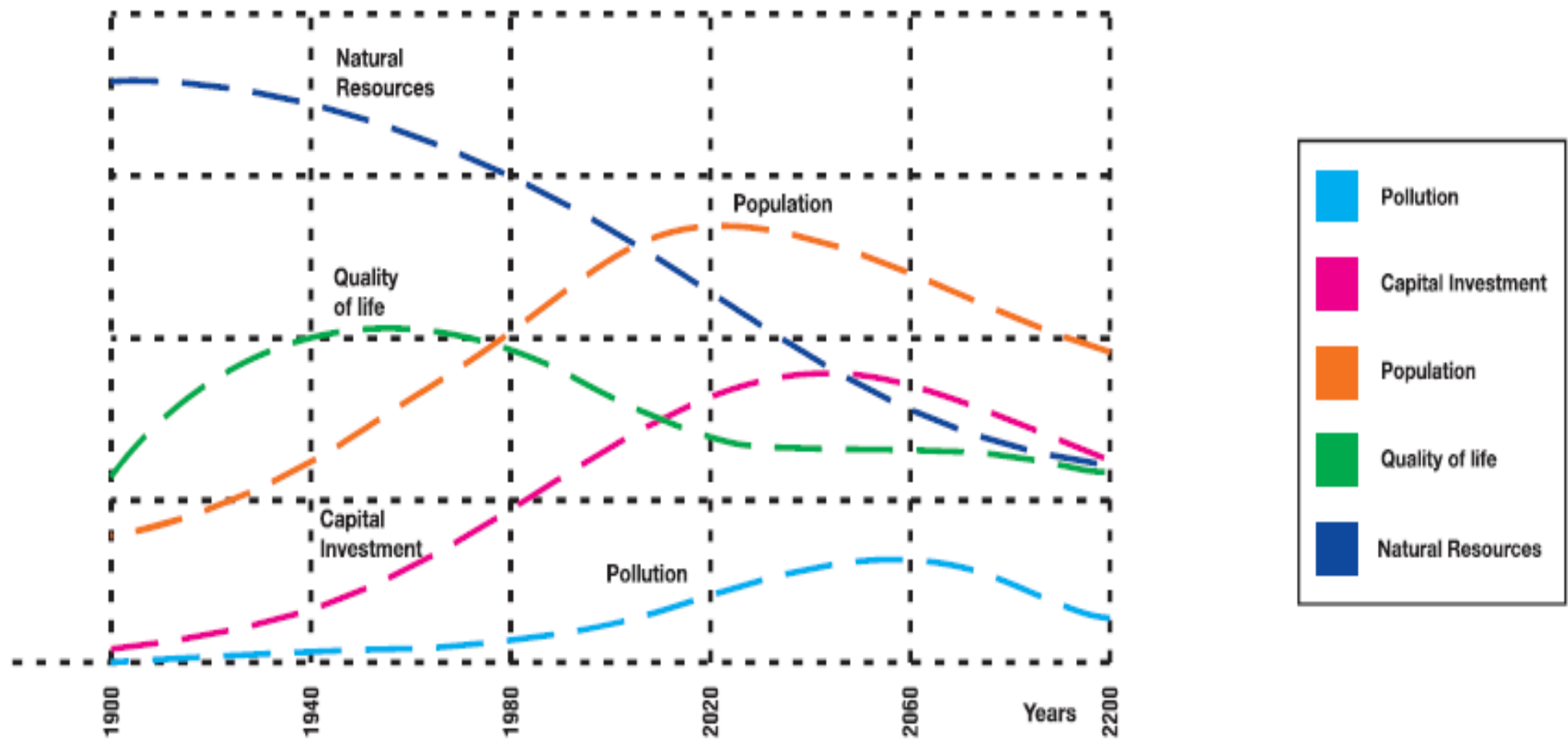


Fig. 2. Natural Resources; Population; Quality of Life; Capital Investment; Pollution.

One “obvious” solution to the problem is to find ways of using resources more efficiently.

But it turns out that this produces a pollution crisis which exterminates us even more quickly than just leaving things to evolve as they will.

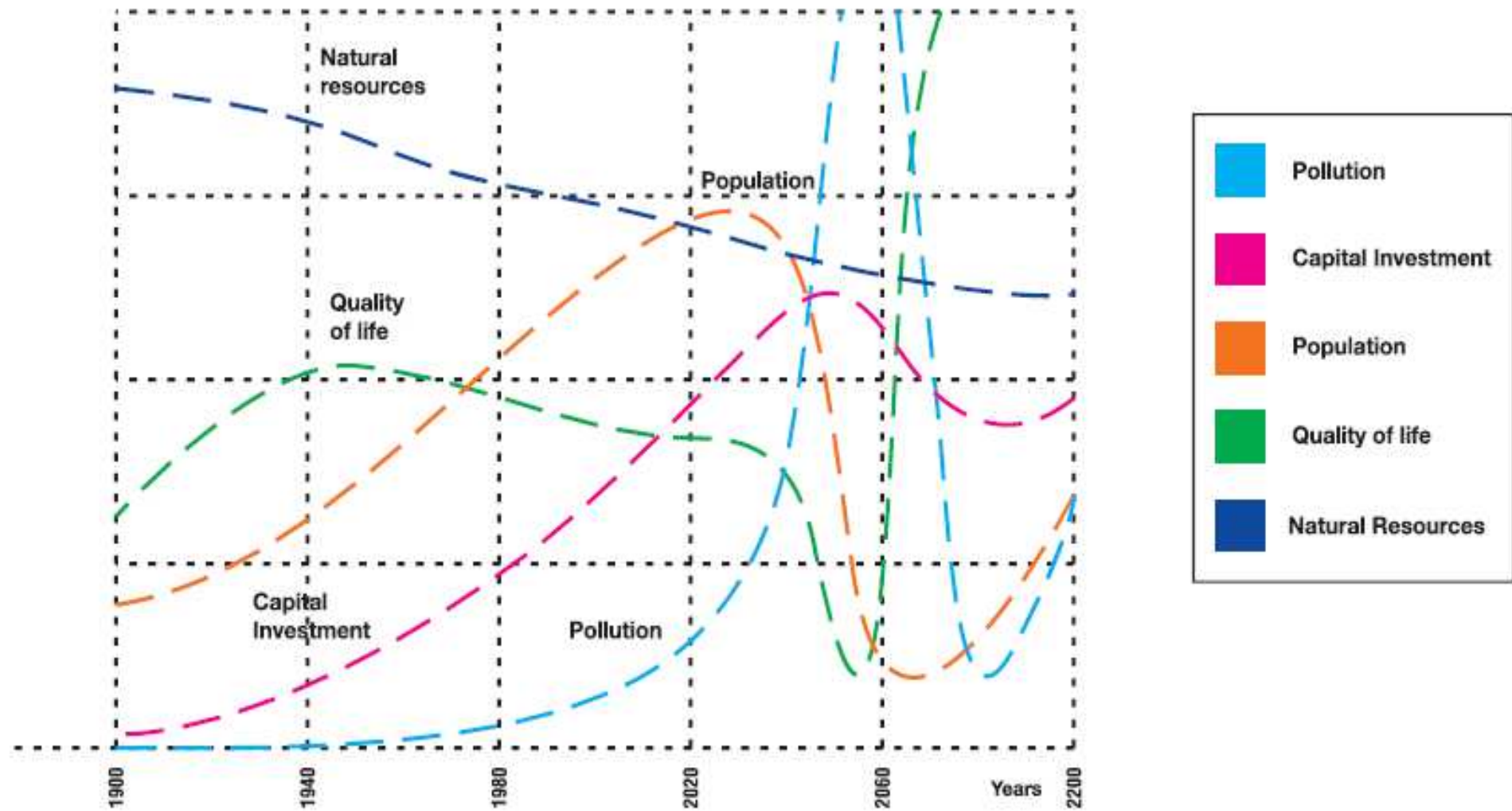


Fig. 3. A pollution crisis is precipitated by lower usage of natural resources. In 1970, natural resource usage is reduced 75 per cent by more effective technology without affecting material standard of living. The Pollution crisis produces a dramatic drop in population.

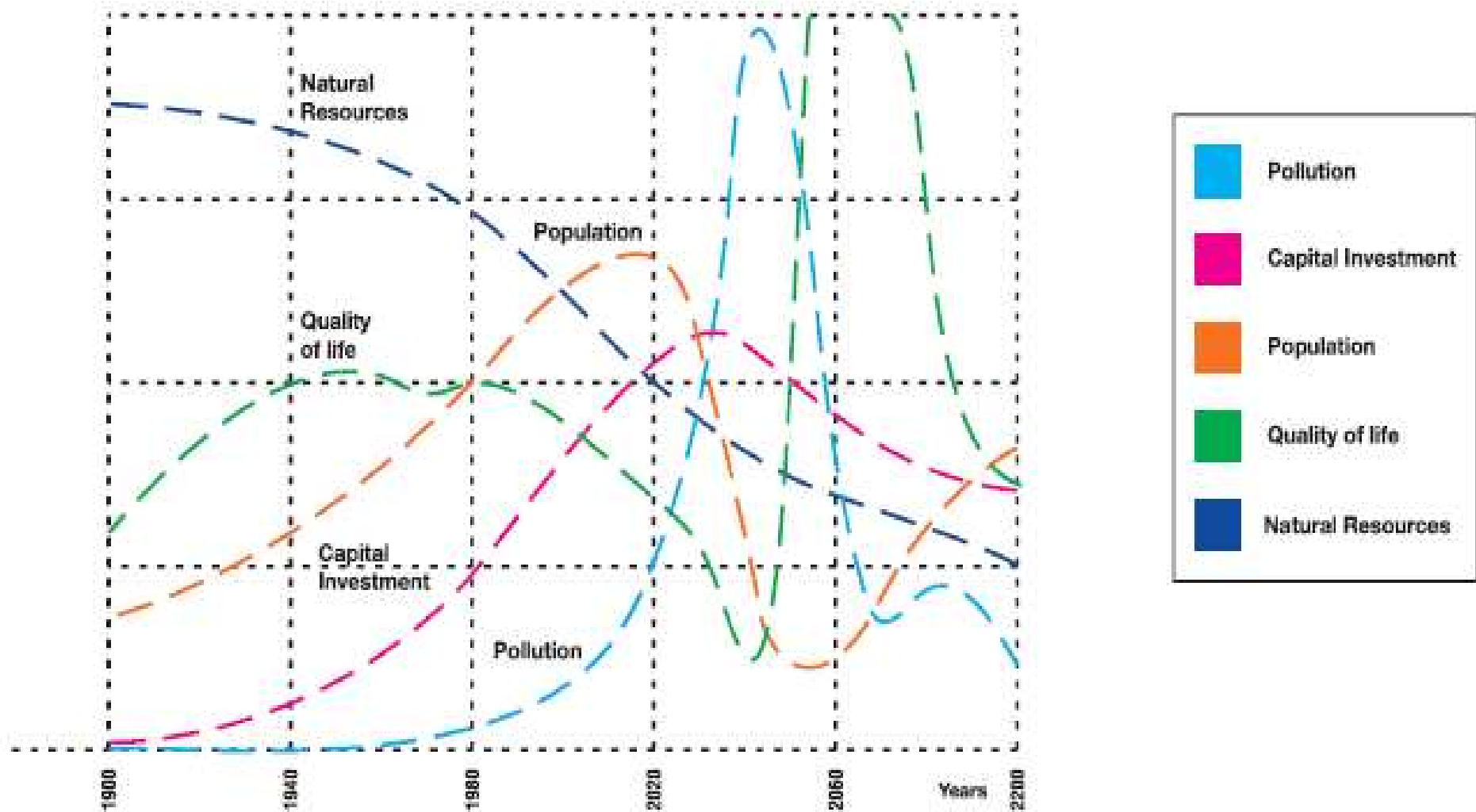


Fig. 4. In 1970, the rate of capital accumulation is increased 20 per cent in an effort to reverse the decline in quality of life. The pollution crisis occurs before natural resources are depleted. Again this produces an unprecedented drop in population.

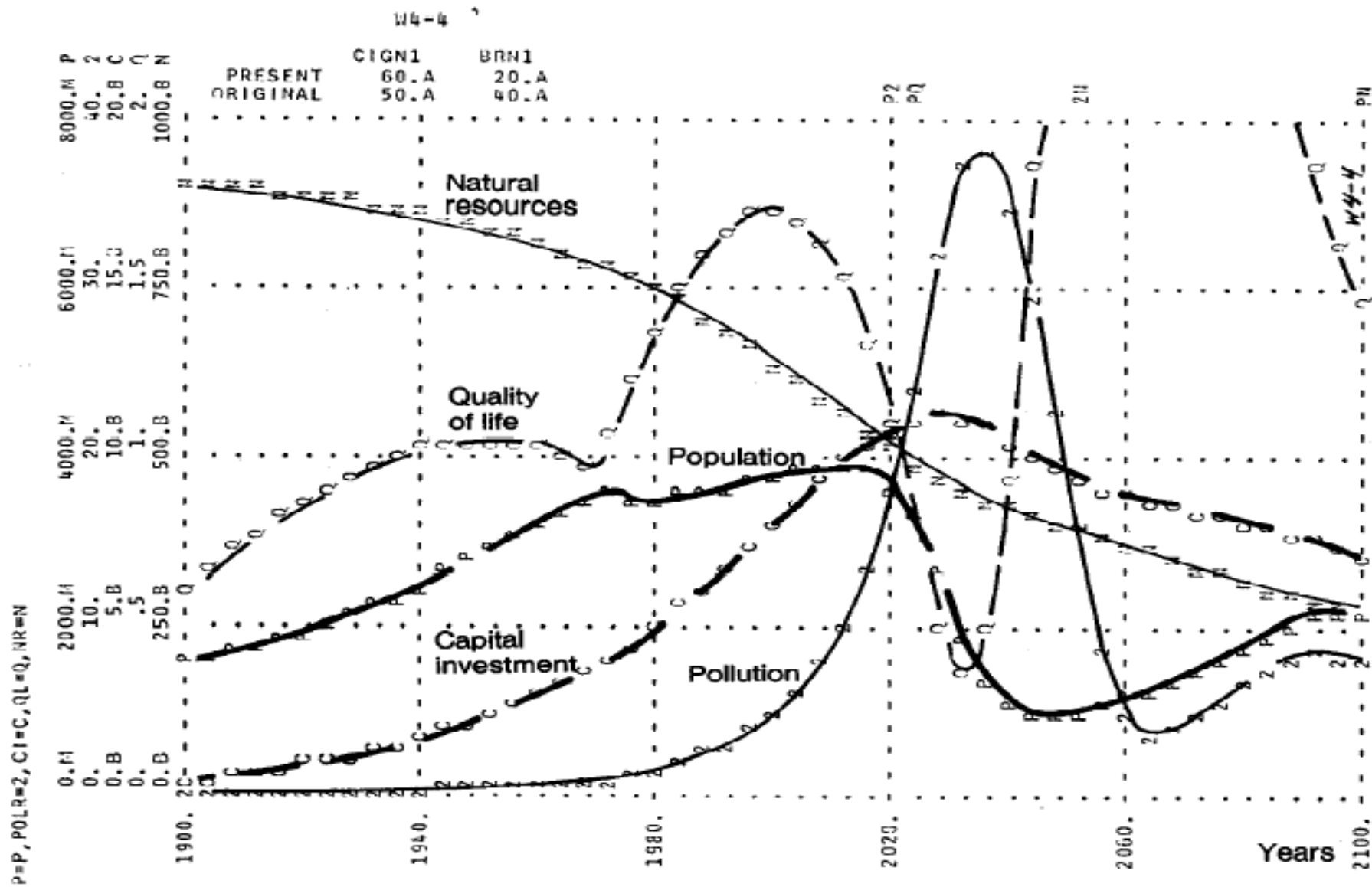


Fig. 5. In 1970 the 20 per cent increase in capital accumulation of Figure 4 is retained and “normal” birth rate is reduced 50 per cent. Capital investment continues to grow until a pollution crisis develops. After an initial decline, population is again pushed up by the rapid rise in quality of life that precedes the collapse.

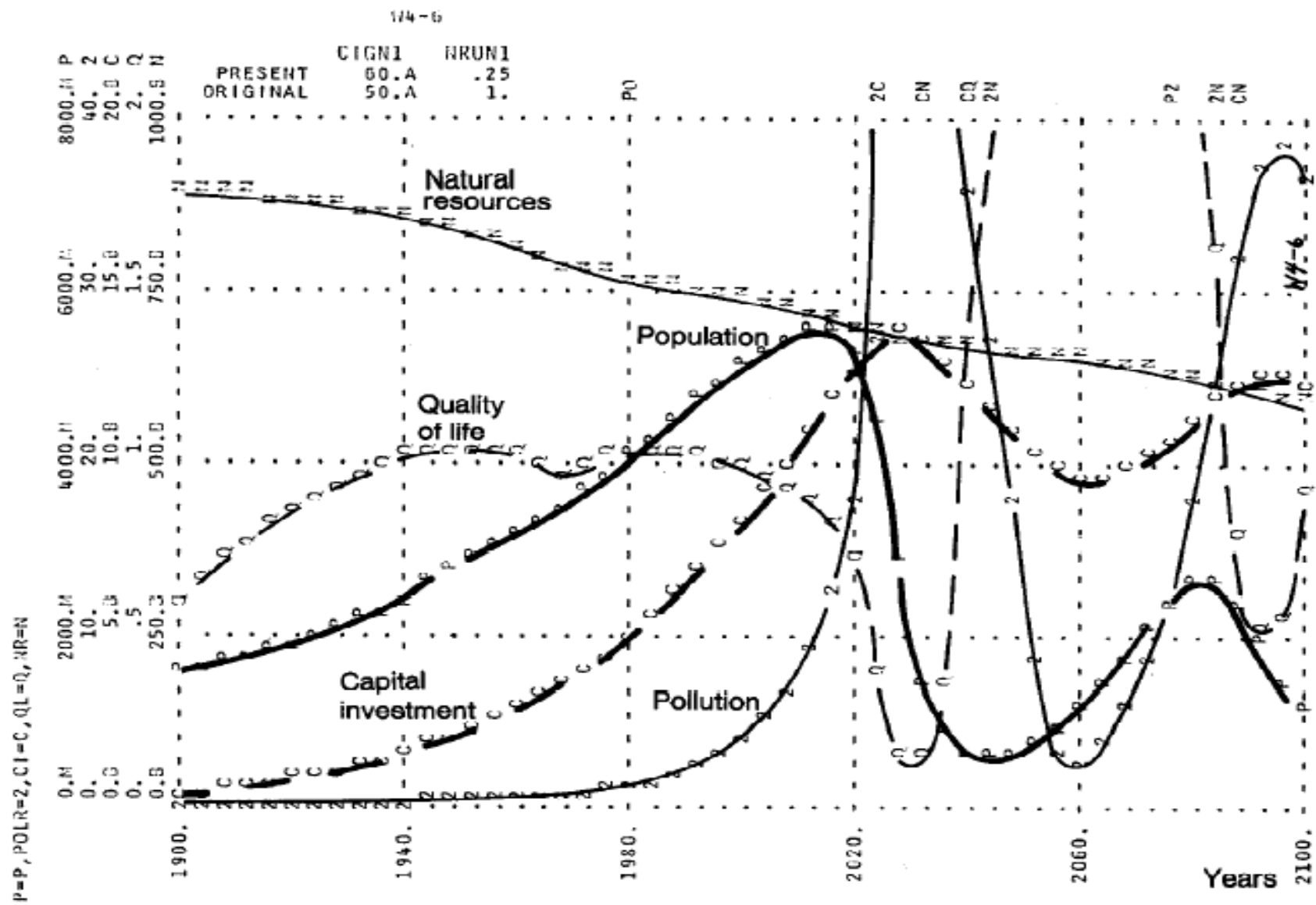


Fig. 6. The 20 per cent increase of capital investment from Figure 4 and the 75 per cent reduction of natural resource usage from Figure 3 are combined.

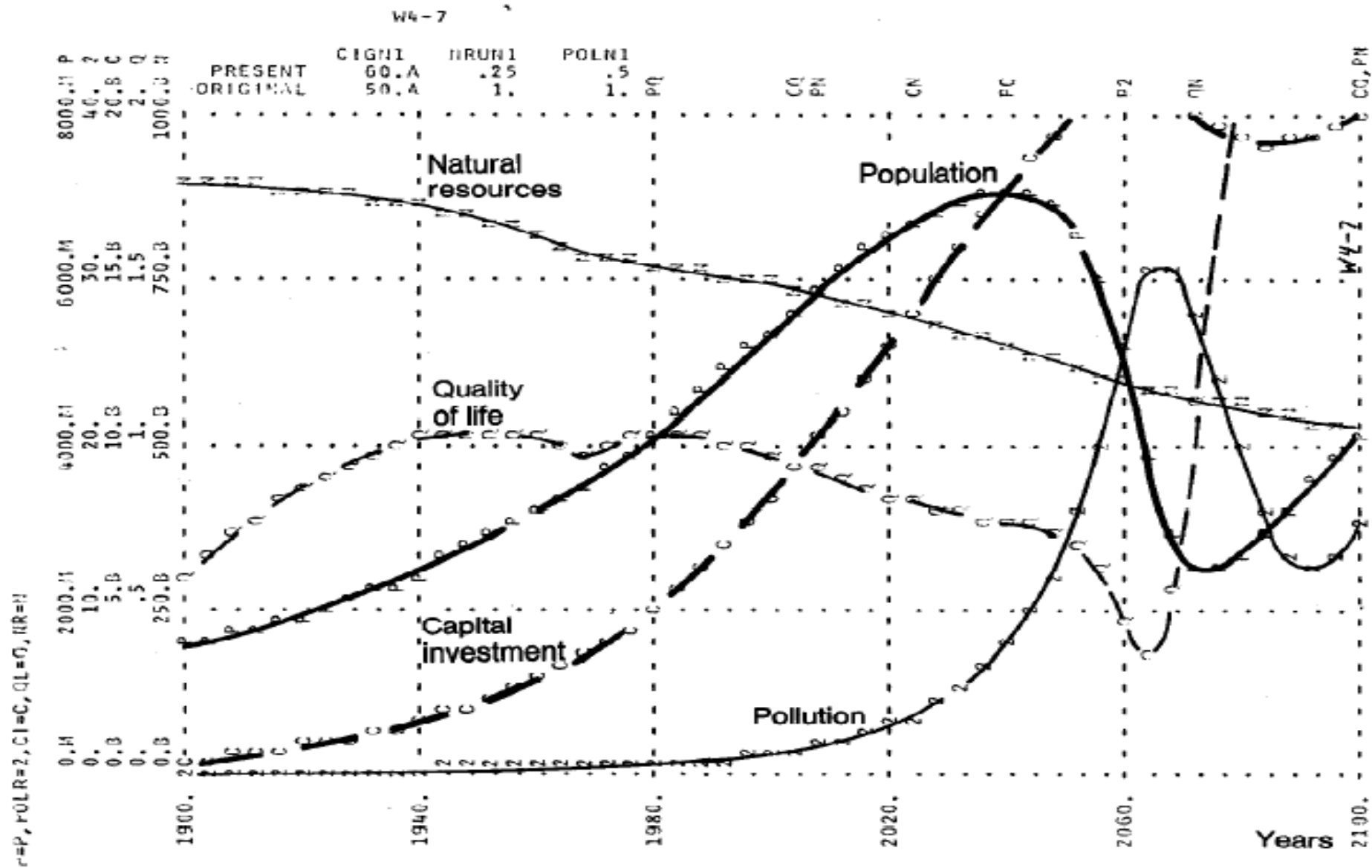


Fig. 7. Increased capital investment rate and reduced natural resource usage from Figure 6 are retained. In addition in 1970 the normal rate of pollution generation is reduced 50 per cent. The effect of pollution control is to allow population to grow 25 per cent further and to delay the pollution crisis by 20 years.

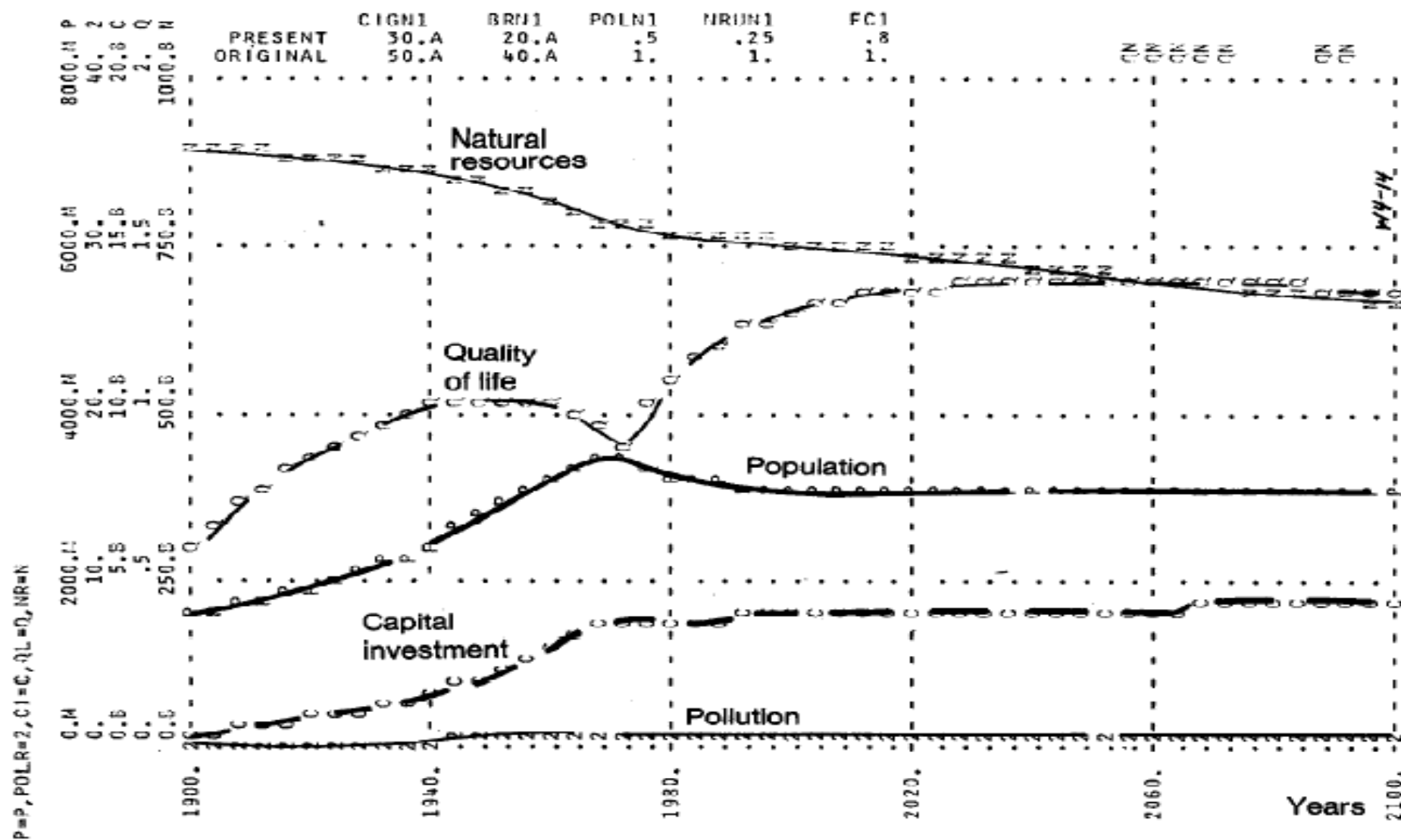


Fig. 8. One set of conditions that establishes a world equilibrium at a high quality of life. In 1970 normal capital investment rate is reduced 40 per cent, normal birth rate is reduced 50 per cent, normal pollution generation is reduced 50 per cent, normal natural resource usage rate is reduced 75 per cent, and normal food production reduced 20 per cent.