



Myths and Perspectives on Land Use and Land Cover Research in Amazonia

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- While we would like to think that as scientists, we are free of the influence that myths can play in shaping our research agenda, and our interpretation of data, some myths are so deeply pervasive in our cultures, and the literature, that it is hard to escape their influence.
- The power of myths over science lies in the fact that we rarely reflect about these omissions that allow the myth, or un-debated ideas, to persist. As scientists we need to expose myths and demystify them so that they do not continue to influence our interpretation of the scientific data we collect and analyze. That is the goal of this paper.
- Myths hold their power because of their familiarity, and the common sense that they seem to stand for. They tend to be simple, straight-forward, and have wide applicability (like good theory!). And like theory, they are not immediately testable.



- This paper is the product of a discussion that began at a synthesis workshop held in Manaus this past summer, and subsequent writing and interactions between several of the attendees at this workshop.
- I want to thank in particular Edna Castro, Francisco Costa, Daniel Hogan, Tatiana Shorr, Mateus Batistella and Diogenes Alves whose ideas have been incorporated into this presentation. Others present contributed many other ideas which I will try to incorporate in the published version
- Besides the powerpoint, there is a draft of this paper written that I would welcome comments on.....



- **Myth 1. The Amazon as El Dorado** – an area holding vast riches of natural resources and biodiversity and holds the promise of monetary riches to be exploited. The reverse is that it needs to be preserved for the future, rather than the present.



- **Myth 2. Population growth is the major destructive force**, or driver, responsible for the degradation of the Amazonian environment. The reverse is that the Amazon is empty of people and needs immigration.



- **Myth 3. The soils of the Amazon are very poor and agricultural development efforts will fail.** The reverse is that technology can resolve all the problems presented by soils.



- **Myth 4. Only the large-scale entrepreneur has the capacity to develop the agricultural economy of the Amazon**, because only he has the capital to apply the needed technology. The reverse of this myth is that only the indigenous population and small farmers know how to use the environment of Amazonia without destroying the biodiversity and ecosystem structure and function.



- **Myth 1. The Amazon as El Dorado** – an area holding vast riches of natural resources and biodiversity and holds the promise of monetary riches to be exploited. The reverse is that it needs to be preserved for the future, rather than the present.
- **Reality:** *There is no El Dorado, sorry!! El Dorado myth is a recapitulation of the dreams of riches, of what could be if only we got lucky, and took possession of a vast Land filled with bountiful resources. It is what drives garimpeiros to risk their lives everyday in their search for that big gold nugget, it is what drove Aguirre and other dreamers of the past to come to the Amazon hoping to turn their fortunes.*



El Dorado riches awaiting????



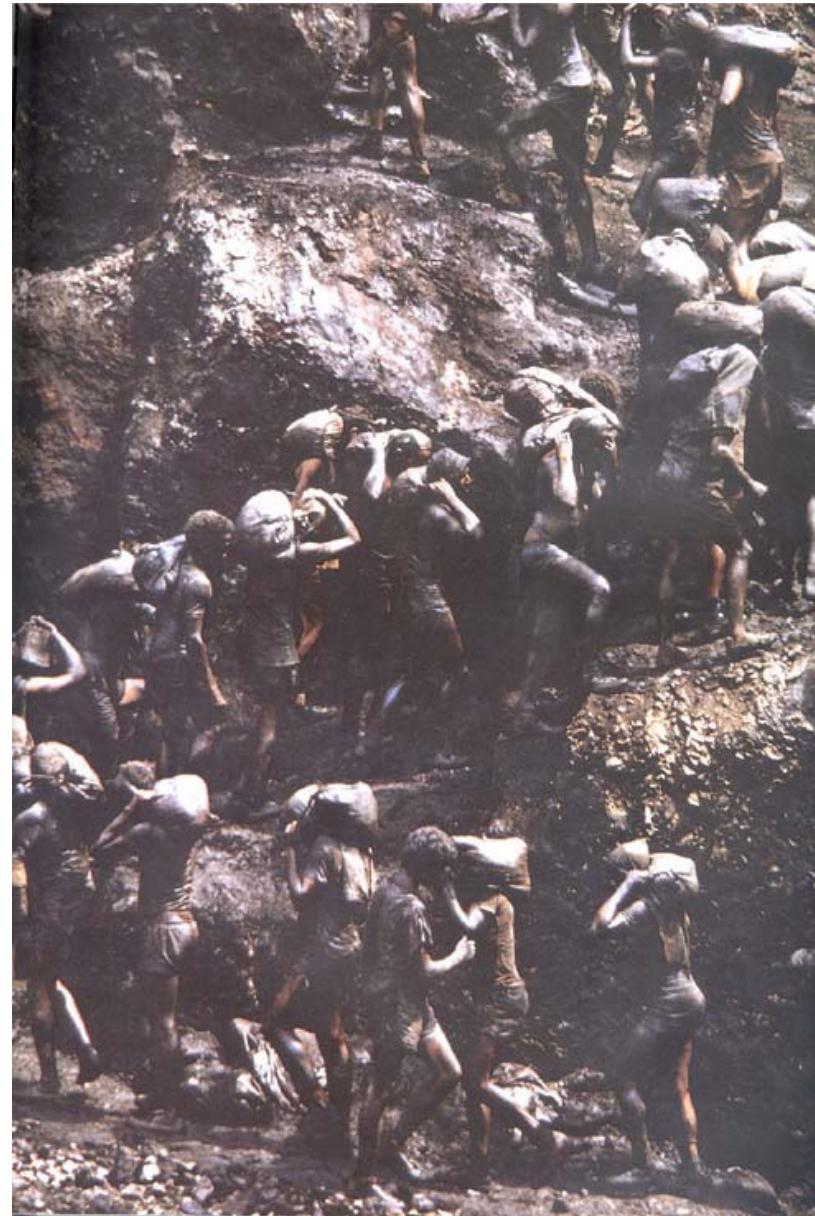


Adventurers of all types are soon stymied by the vastness and the invisibility of the riches foreseen, so they keep opening up more land hoping to find the mythological riches



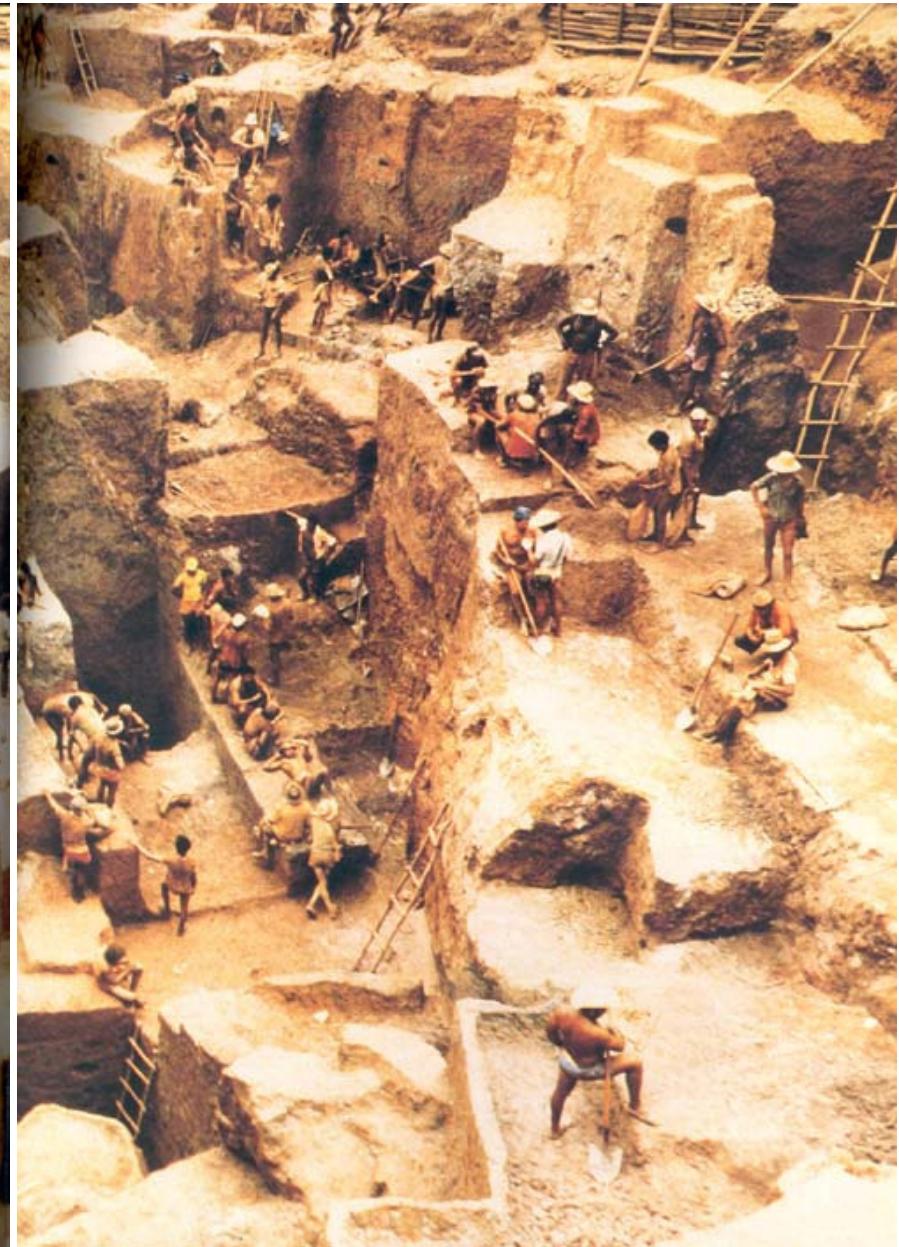
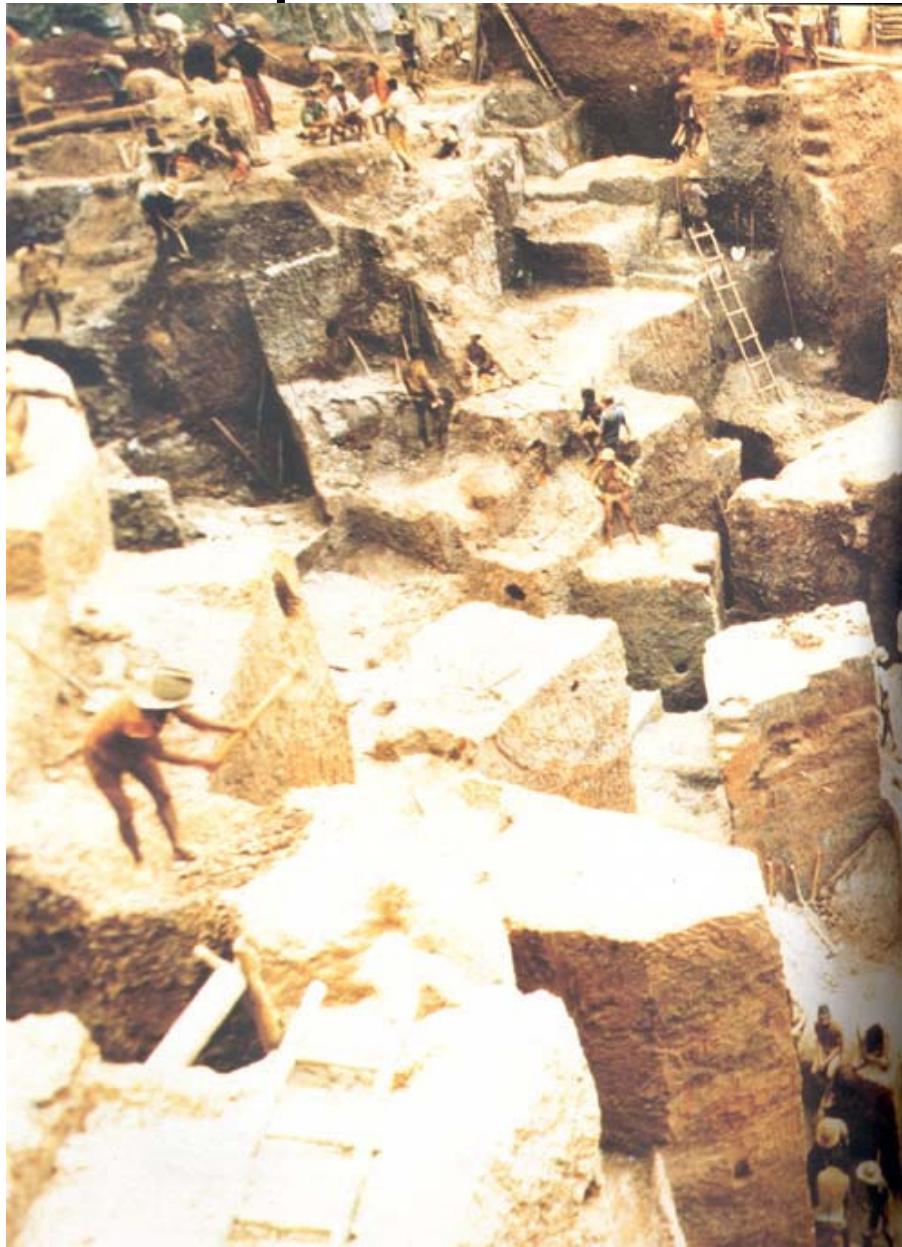


Digging for Gold (rainy period)





Gold mining pits





Migrants were attracted to the Transamazon Settlement Program with promises of rich soils, free land, subsidies, credit and technical support





Altamira 1972 – along the road



Altamira –agrovila do km 23 em 1972

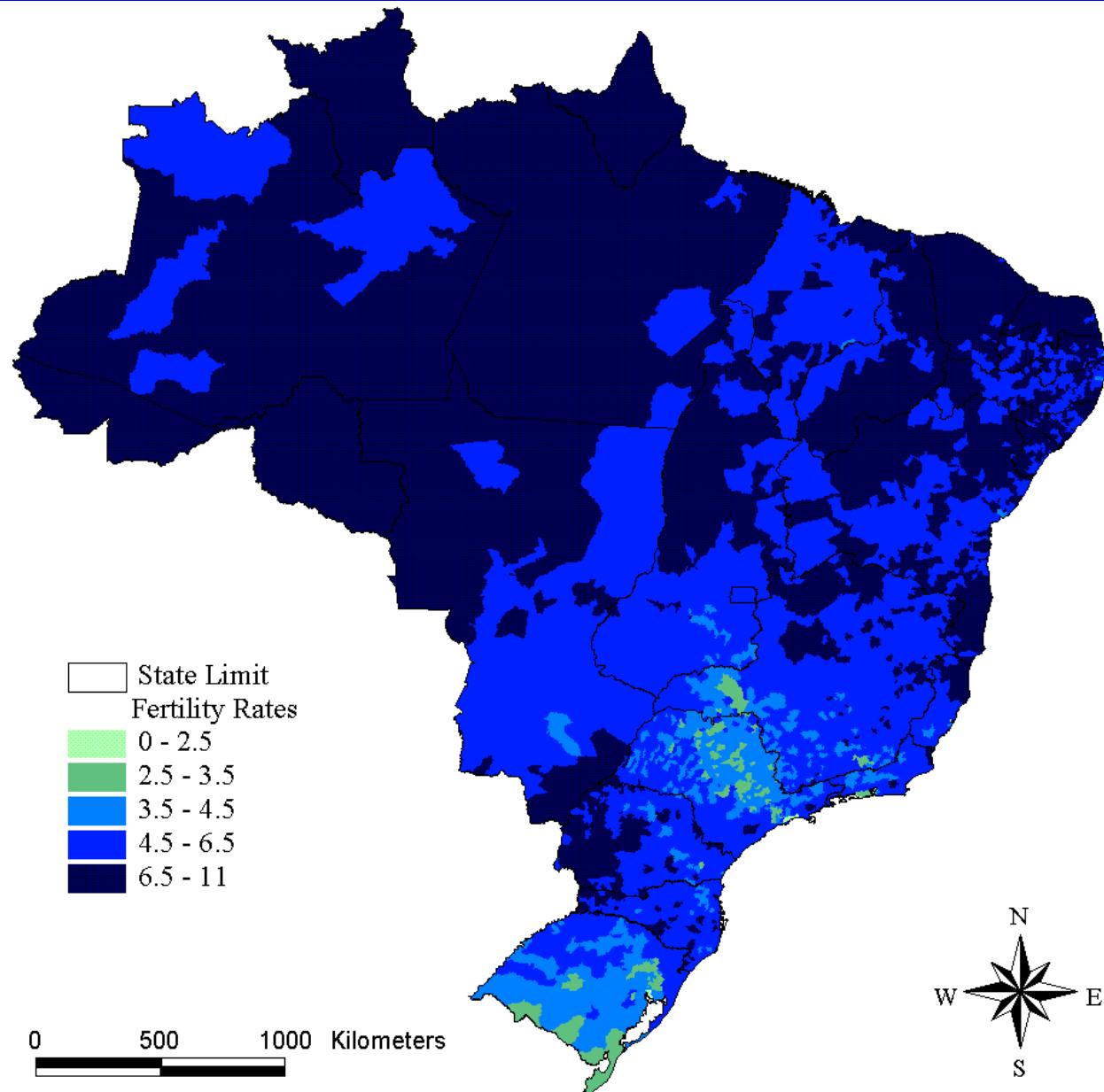


Altamira 1973- This man thought he had found the Promised Land: three years later he

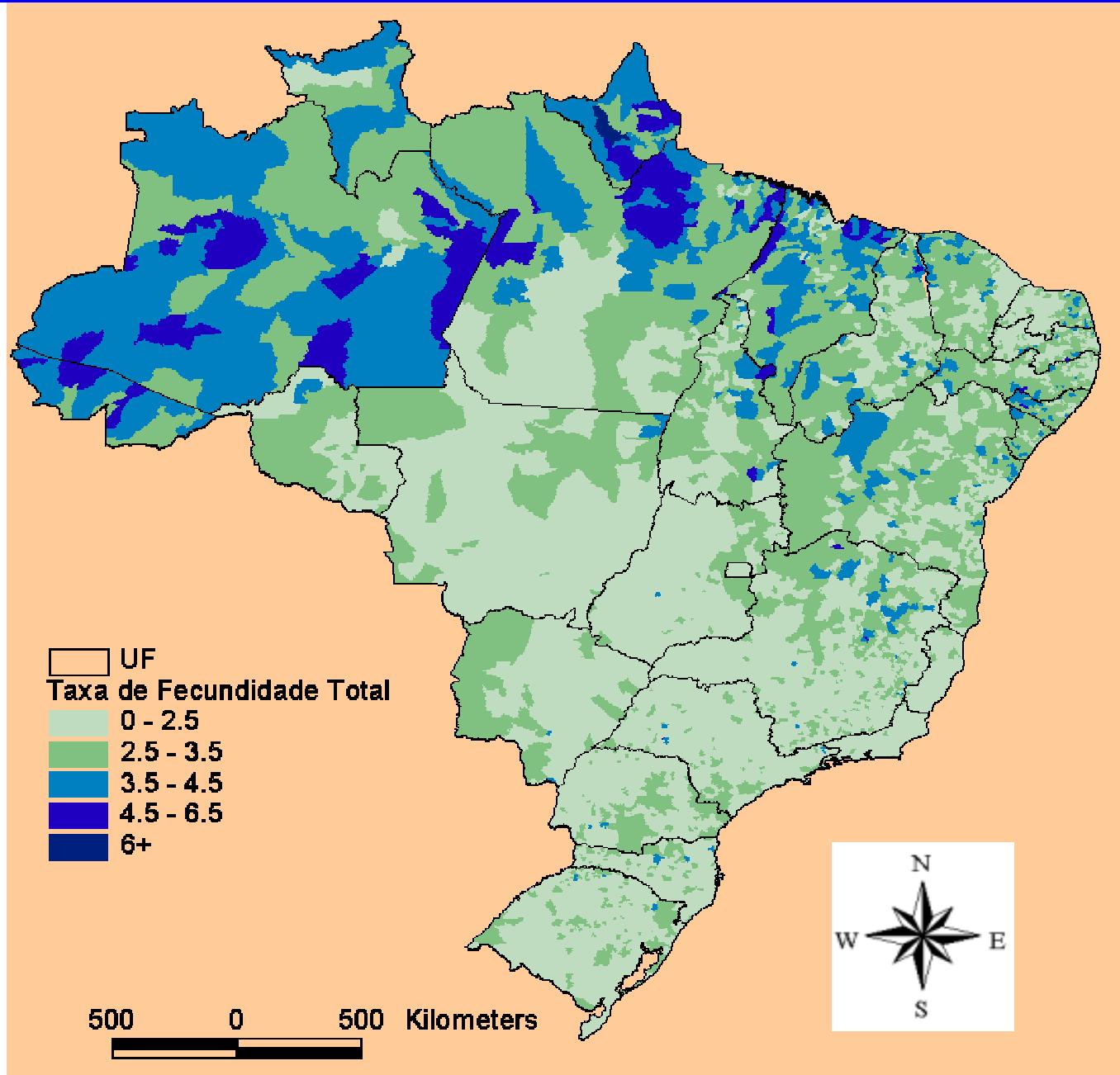


- **Myth 2. Population growth is the major destructive force**, or driver, responsible for the degradation of the Amazonian environment. The reverse is that the Amazon is empty of people and needs immigration.
- **Reality:** The Amazon has had people for millennia, yet it was only with policy decisions of the military regime that the Amazon began to be deforested in a systematic fashion. The major driver are government decisions to open up the region. Brazilian fertility has been declining precipitously over the same period that deforestation has been increasing rapidly!

Total Fertility Rate - 1970



Total Fertility Rate - 2000





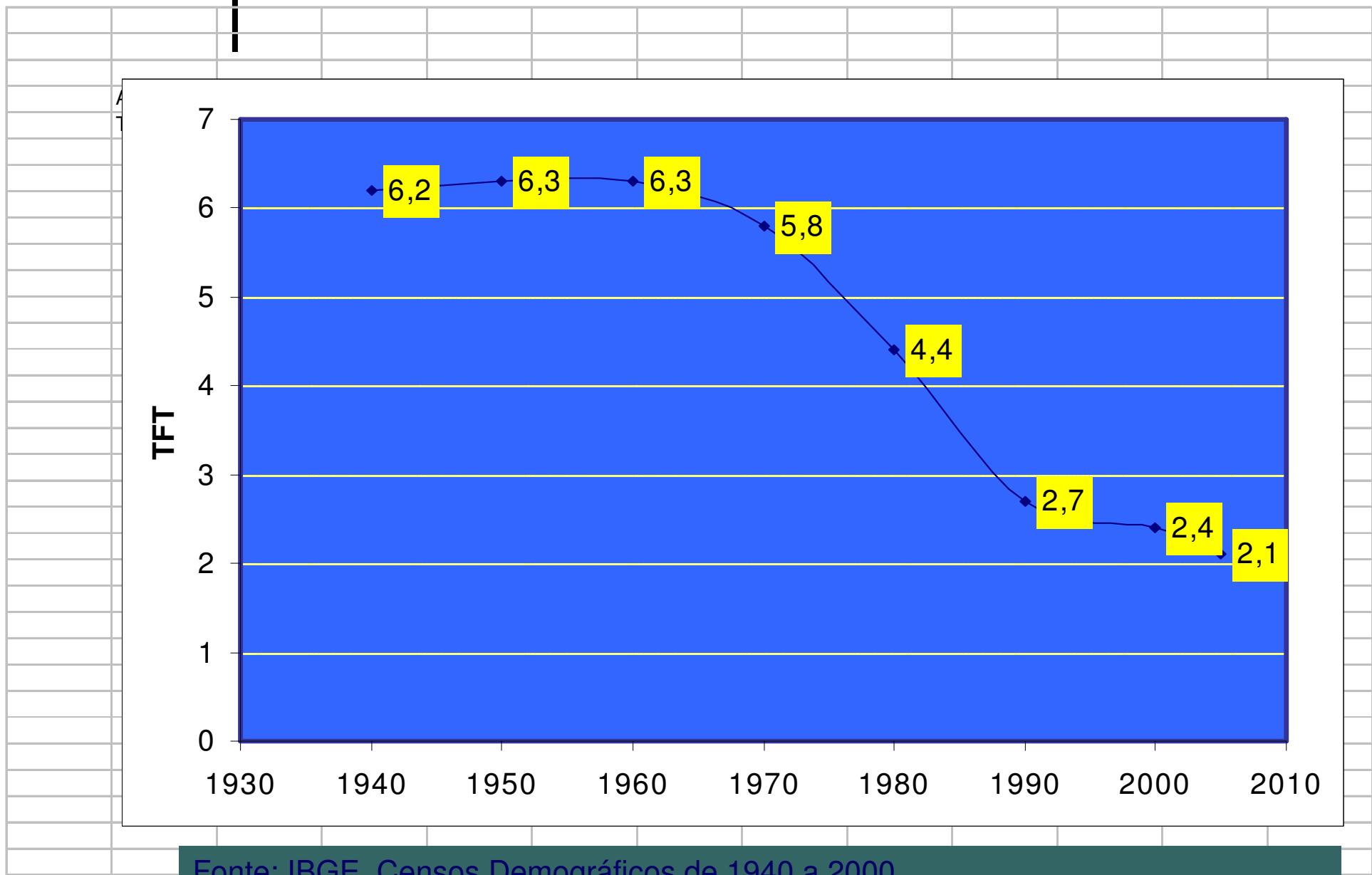
It is NOT population driving deforestation!!!

- This is abundantly clear today, when rapid forest loss continues in spite of persistently low fertility rates, and reduced migratory fluxes into the region.
- The Amazonian population of 11 million in 2000, is concentrated in cities (70%), not in forest lands.
- The region's population density of 3.37 persons/km² is **extremely low**.
- It is difficult to conclude that “population pressure” is responsible for the environmental threats facing the Amazon, bearing in mind that interregional migration, including frontier migration, was declining by 2000 – from 56 million migrants in the 1980-1991 decade to 13 million between 1991 and 2000—while deforestation kept increasing.....



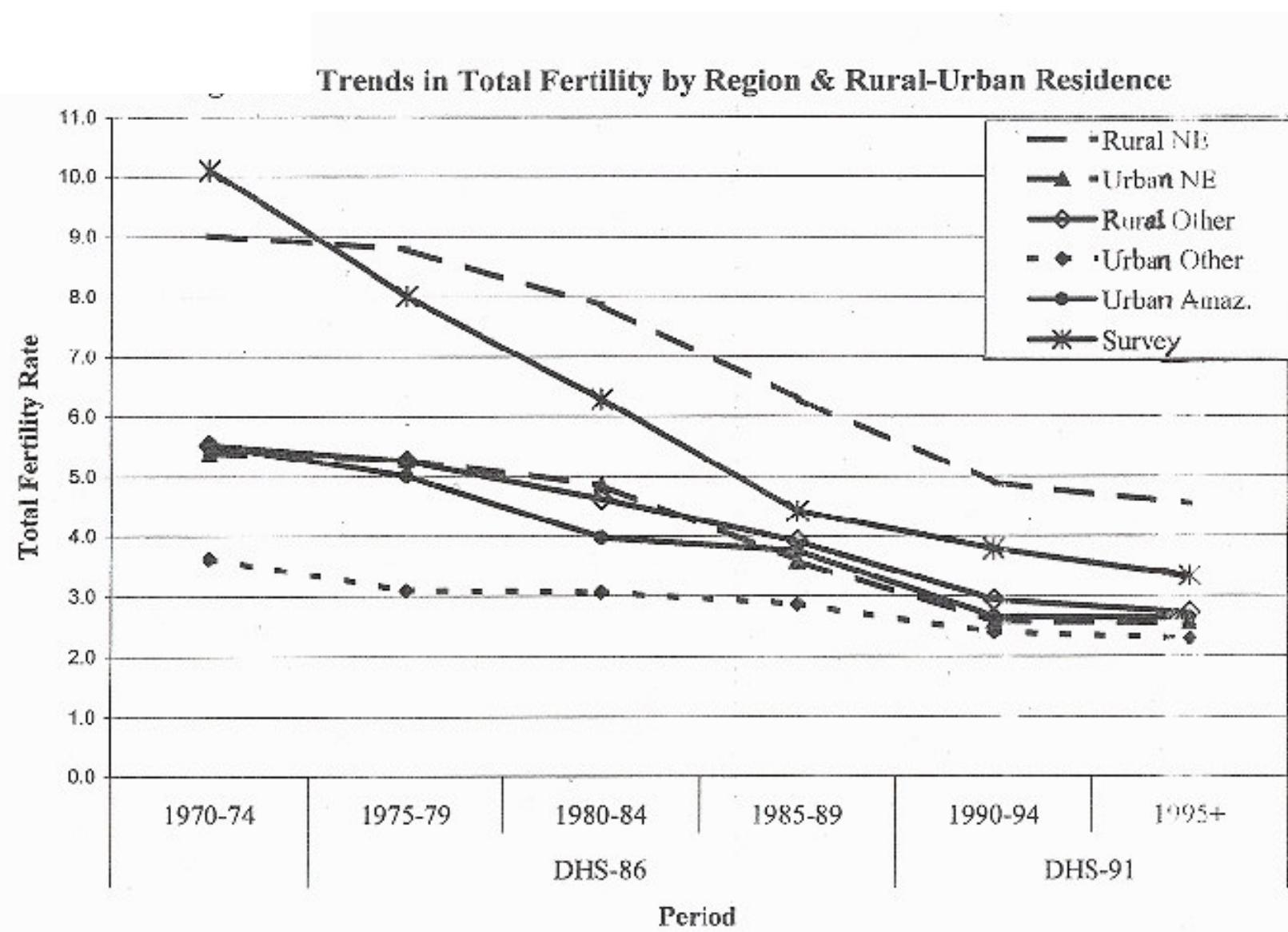
- We now know that Brazil's demographic growth had already peaked in the mid-sixties, and that the rapid female fertility decline of the seventies, eighties and nineties would lead to the near-replacement rate of 2.1 children per woman by 2004.

Total Fertility: Brasil, 1940 a 2005

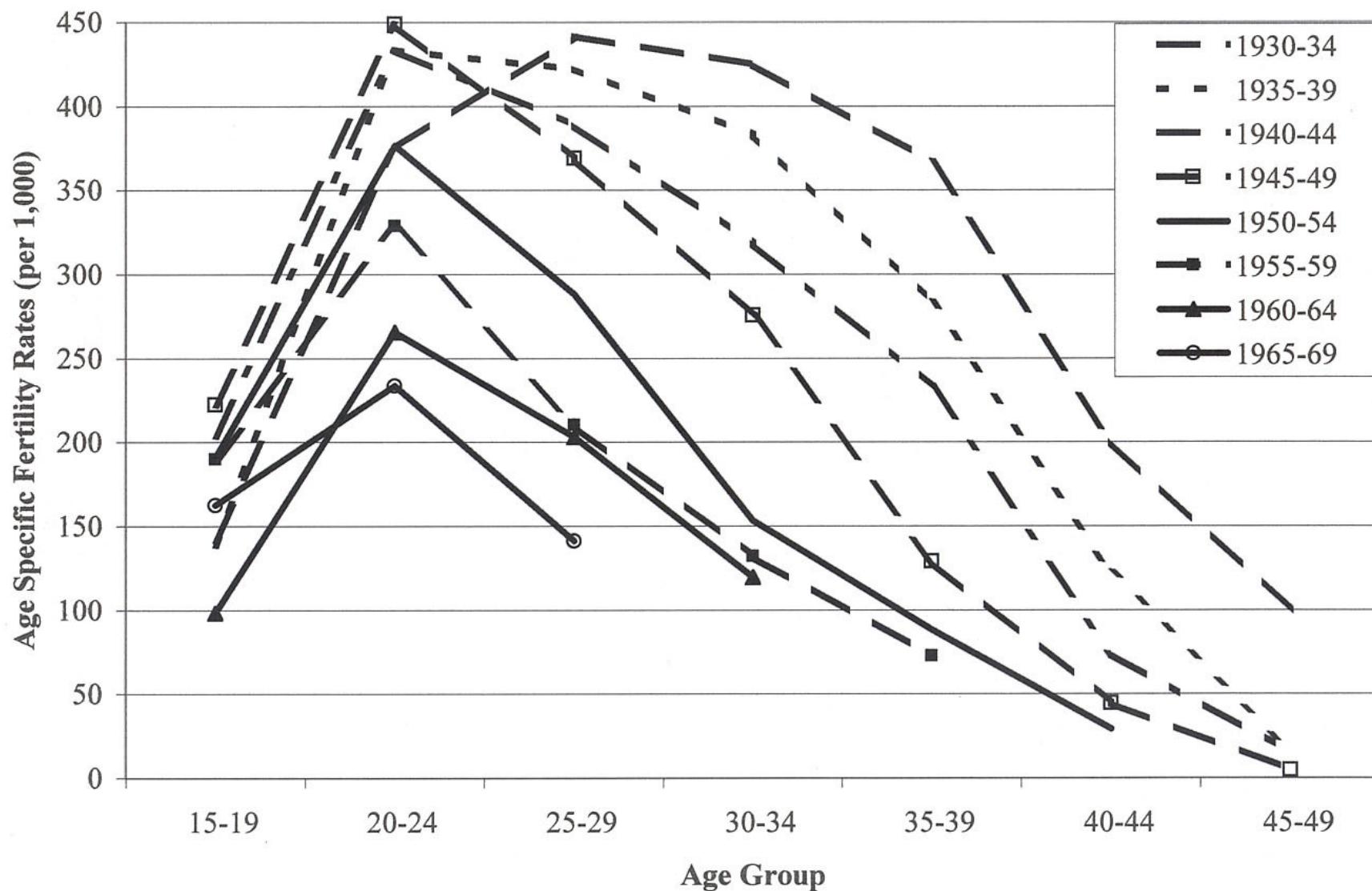


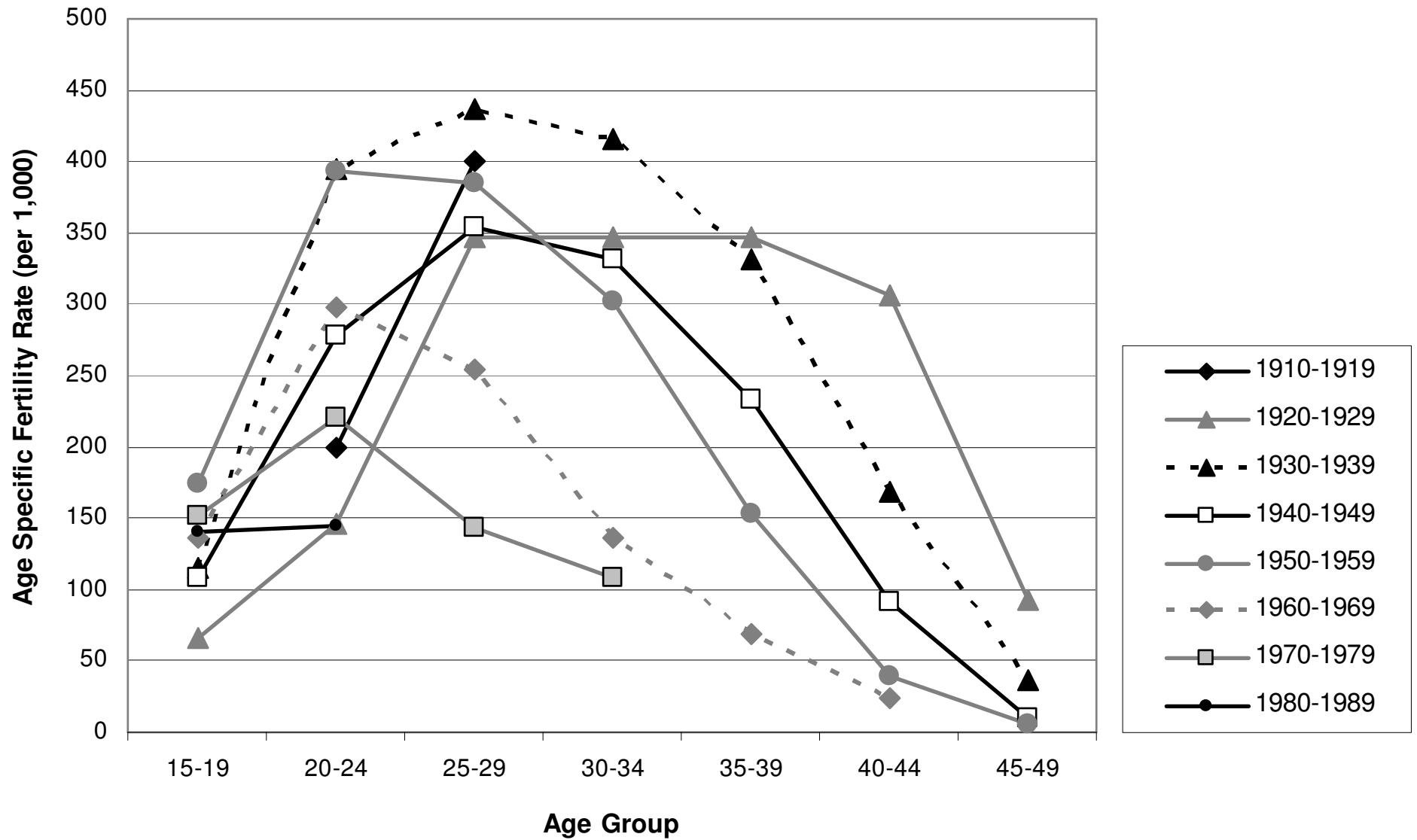


- The significant interregional differentials in fertility, furthermore, have converged and are now minor fluctuations around the national average, so that the Amazon's traditional higher family size increasingly approximates the Brazilian norm.

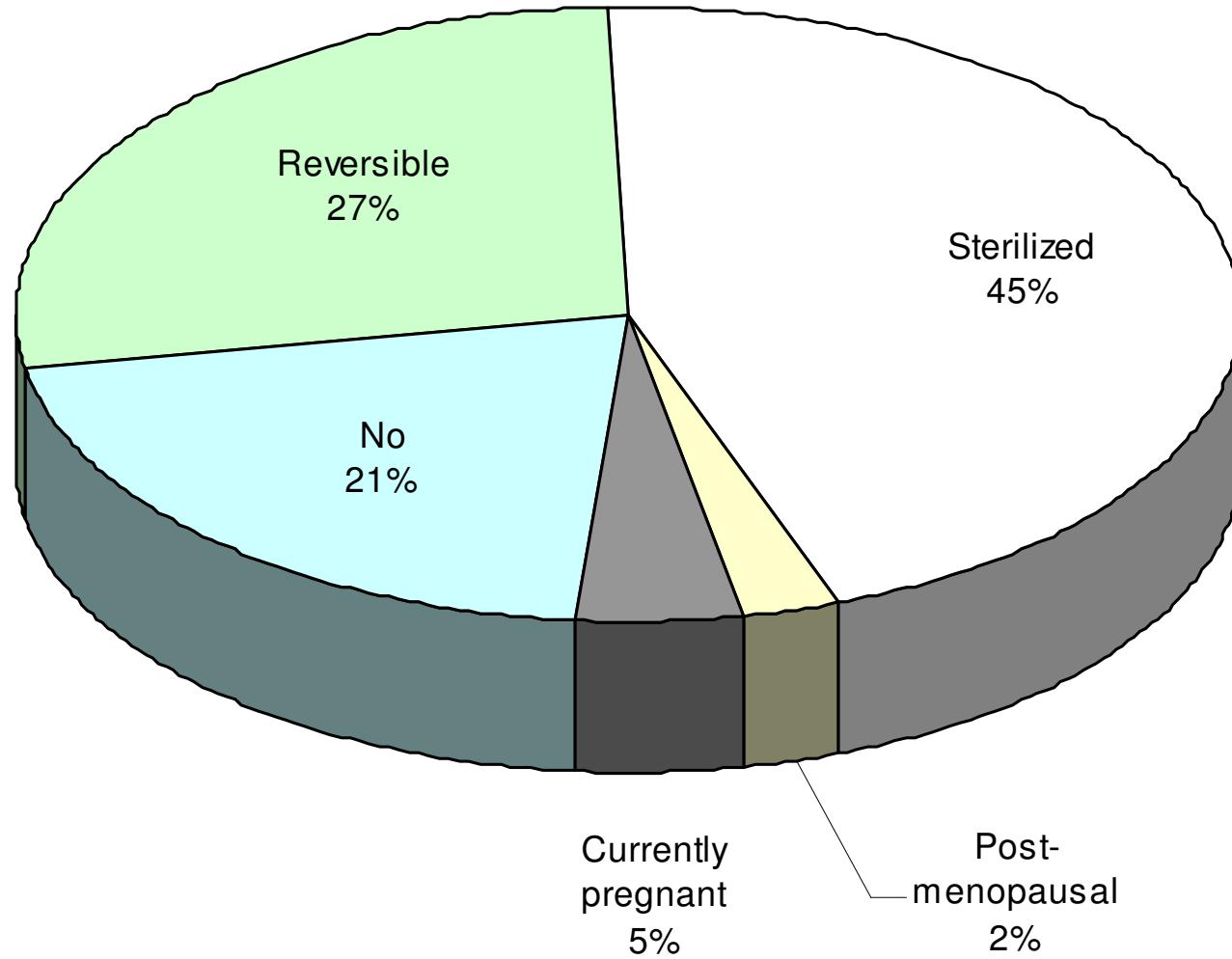


Age Specific Fertility Rates by Birth Cohort, Altamira Survey





Fertility Rate, Santarém, Pará, Brazil, 2003



Use of Contraceptive Methods by Married Women between ages 15-49 (n=217), Santarém, Pará, Brazil, 2003



Percent of Sterilized Women and Average Age of Sterilization by Cohorts, Santarém, Pará, Brazil, 2003





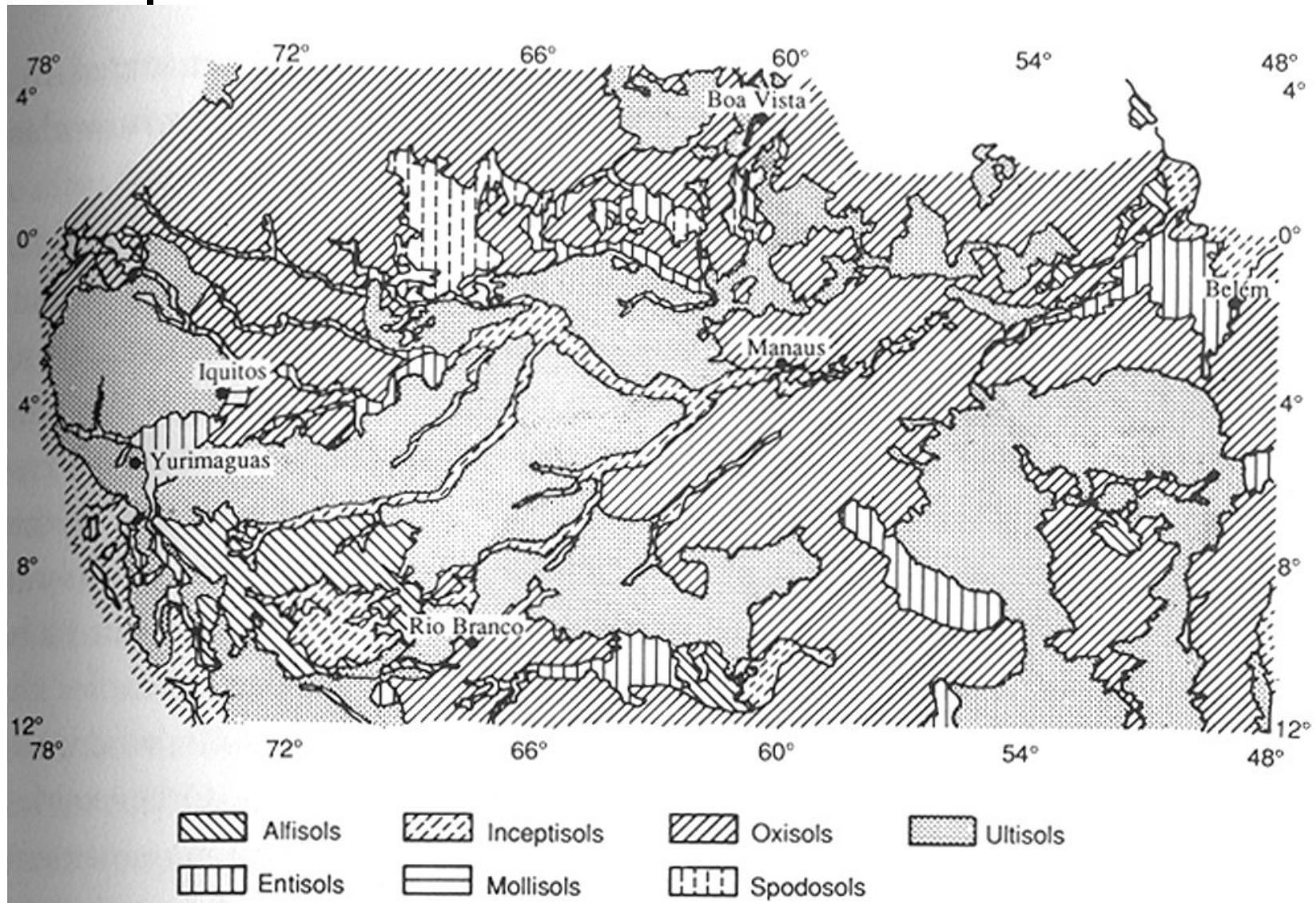
- **Population growth has not been, nor is it today, the major factor in the deforestation of the Amazon.**



- **Myth 3. The soils of the Amazon are very poor and agricultural development efforts will fail.** The reverse is that technology can resolve all the problems presented by soils.
- **Reality:** The Amazon has a complete array of soils with varied qualities from extremely poor to extremely rich!! Agronomic research points out that at least 10% of the Basin, or 500,000 sq km have soils of medium to high fertility, an area de size of Spain and nearly the size of France.



Amazonian Soils





Altamira 1972 : an oxisol of low fertility



Altamira 1974 –sandy soils along one of the side roads, very poor

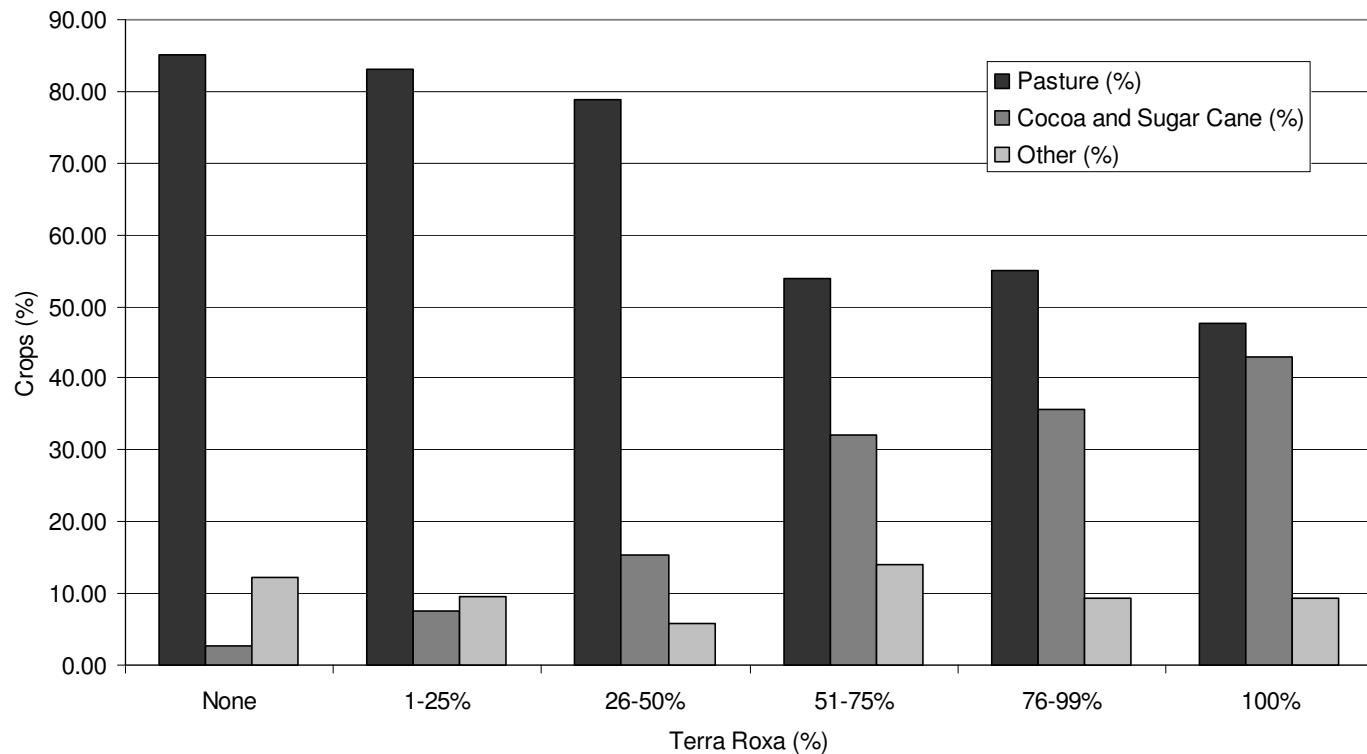


Altamira 1972 , an alfisol with high fertility

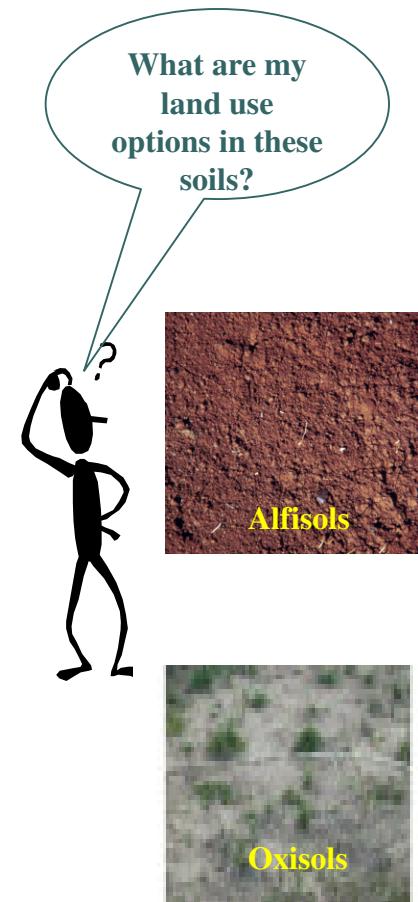


Figure 12

CROPS AND TERRA ROXA



Source: Survey in Altamira 1998, N=402





Reality of Soils in the Amazon:

- There is sound agronomic research pointing out that at least 10% of the Basin, or 500,000 sq km have soils of medium to high fertility:
- an area comparable to the territory of Spain (504,000 km²)
- and only slightly smaller than all of France (670,000km²)—hardly an insignificant area.
- Saying that it is **only** 10% suggests a marginal value, and too small to make us modify our broad generalizations about them-- that is certainly not the case given its absolute large amount.
- Even the FAO soils map shows at a scale of 1:5 million two large patches of alfisols or *terra roxa estruturada eutrófica* in the vicinity of Altamira and Rondonia, and alfisol areas in smaller patches are available throughout the Basin, as are fertile floodplain soils accounting for at least another 2 to 3% of the Basin.



- **Myth 4. Only the large-scale entrepreneur has the capacity to develop the agricultural economy of the Amazon**, because only he has the capital to apply the needed technology. The reverse of this myth is that only the indigenous population and small farmers know how to use the environment of Amazonia without destroying the biodiversity and ecosystem structure and function.
- **Reality:** Most large scale producers operate indistinguishably from small scale producers in their technical inputs and rates of return. They do not apply capital and technology as promised, and they fail very often to reach their goals



Rice in Altamira 1974 along Transamazon Highway



- For 23 years Ford invested heavily in planting rubber in the Tapajós region, developing sophisticated technology for its time. When Ford transferred these plantations after more than two decades of investment, it had failed to turn a profit and it had succeeded in implementing only 5% of its original plan and 7% of the goals set (Costa, 1993).
- After nearly 20 years, it has been shown that barely 10% of the large-scale enterprises attracted by SUDAM incentives and tax holidays were operating profitably (Gasques e Yokomizo, 1990; Costa, 2000)



- Costa (2006) demonstrates that barely 5% of the herd belonged to cattle ranchers who used more intensive technology capable of reaching 0.78 head of cattle per hectare
- According to Costa (2006) it is only for the **very large** cattle ranchers (with more than 12,000 head), that it is possible to turn a profit through intensification and high inputs. The great majority of large enterprises in Amazonia operate almost indistinguishably from the small producer in their reliance on extensive management and low inputs (Costa 2006).



Conclusions

These and other myths about Amazonia affect policy for the region, and even the interpretations of scientists of the ecosystem dynamics, and human dimensions of the Basin:

- Population growth is not the problem or driver of deforestation,
 - We will never find El Dorado in Amazonia,
 - soils are not always poor, and
 - the large scale enterprise is not always able or willing to implement its high tech promises.
-
- The sooner we stop using these myths as convenient short cuts to explain system dynamics, the sooner we can be sure that our science will not be undermined by poorly supported myths that serve special interests rather than science or good policy-making



Conclusions

- Scientists have an important role to play if they consciously examine these easy myths and conceptualize their analysis in a way that is self-consciously wary of untested a priori concepts and myths. It is perilous for our science, and for policy-making, to act as if these myths hold no influence over our decisions. They do: Cuidado, Viu!