



UNIVERSIDADE DO ESTADO DO PARÁ
Pró-Reitoria de Pesquisa e Pós-Graduação
Centro de Ciências Naturais e Tecnologia
Programa de Pós-Graduação em Ciências Ambientais – Mestrado

PROCESSO SELETIVO – 2013

PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS AMBIENTAIS EM NÍVEL DE MESTRADO ACADÊMICO

BOLETIM DE QUESTÕES

Prova Escrita e de Proficiência em Inglês

Nº DE INSCRIÇÃO

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CPF

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INSTRUÇÕES AO CANDIDATO

Leia com atenção as instruções a seguir:

1. A duração desta prova é de **04 (quatro) horas**, exceto para os candidatos portadores de necessidades especiais cuja duração da prova é **05 (cinco) horas** (Aviso Circular do MEC – 277/96 e Portaria 1679/99).
2. **NÃO ESCREVA O SEU NOME NO BOLETIM DE QUESTÕES.** Ele deverá ser identificado **apenas** na folha de rosto com seu número de inscrição e CPF.
3. O Boletim de Questões, destinado à prova escrita e de proficiência, é constituído de:
 - folhas destinadas às questões relativas à prova escrita;
 - folhas destinadas às questões relativas à prova de proficiência;
 - quatro folhas destinadas ao rascunho (use-as se você assim o desejar). **Não serão fornecidas** folhas adicionais;
 - as folhas de rascunho não deverão ser retiradas do Boletim de Questões.
4. Verifique se o Boletim de Questões, destinado à prova escrita e de proficiência, contém algum defeito. Em caso positivo, solicite ao aplicador que proceda a troca por outro.
5. As respostas das questões deverão ser feitas na mesma folha, logo abaixo do comando da questão e no espaço delimitado.
6. Para responder as questões, use apenas caneta esferográfica de tinta azul ou preta.
7. Ao concluir a prova, entregue o Boletim de Questões ao aplicador.
8. Assine a lista de presença à prova escrita e de proficiência na linha correspondente ao seu nome, do mesmo modo como foi assinado no seu documento de identidade.
9. É terminantemente proibida nesta prova:
 - a comunicação entre os candidatos;
 - a consulta a qualquer tipo de material diferente do estabelecido no Edital do Processo Seletivo;
 - a utilização de qualquer aparelho eletrônico, inclusive telefones celulares, que deverão ser desligados durante o período de realização da prova.
10. O candidato será **eliminado** caso sua prova:
 - seja escrita a lápis ou de forma ilegível;
 - contenha nome ou marca que a identifique;
 - contenha qualquer tipo de ofensa aos membros da banca examinadora e a outros;
 - incorra em qualquer uma das situações descritas no item 9.

1. (2 pts.) – De acordo com o artigo “Qualidade das águas superficiais e avaliação do estado trófico do Rio Arari (Ilha de Marajó, norte do Brasil)”, cujos autores são Alves *et al.* (2012), analise e responda as questões a seguir.

a) “Na avaliação da qualidade da água e grau de eutrofização de um corpo hídrico são utilizados Índices de Qualidade da Água (IQA) e Estado Trófico (IET)”. Cite 4 (quatro) possibilidades que justificam a utilização desses índices.

b) Os índices de estado trófico, tanto para o fósforo quanto para a clorofila, foram estabelecidos para ambientes lóticos. Explique e dê exemplo de “ambientes lóticos”.

c) “A aplicação do IQA nas águas do Rio Arari não demonstrou eficiência, uma vez que o IQA usa cálculo para alguns parâmetros muito restritivos quando se trata de águas amazônicas”. Cite e explique os “parâmetros muito restritivos” a que se referem os autores.

3. (2 pts.) – Com base no Relatório do PNUMA (2011), “Caminhos para o Desenvolvimento Sustentável e a Erradicação da Pobreza – Síntese para Tomadores de Decisão”, responda as questões a seguir:

(a) Há décadas vivemos sob a égide de uma economia marrom. Cite dois problemas que este tipo de modelo de economia não conseguiu vencer.

(b) Uma economia verde valoriza e investe no capital natural. Neste caso, estabeleça relações entre a biodiversidade e bens e serviços do ecossistema.

(c) Embora uma transição para uma economia verde envolva muitos atores, cite 4 (quatro) condições, tomadas de governos nacionais, que favorecem esta transição.

5. (2 pts.) – A questão do desflorestamento na Amazônia brasileira (MACHADO, 2009) e das mudanças climáticas globais (JACOBI *et al.*, 2011) são tratadas nas questões a seguir.

No artigo “Desflorestamento na Amazônia brasileira: ação coletiva, governança e governabilidade em área de fronteira”, de Machado (2009), são abordados inúmeros conceitos e concepções sobre a ocupação e uso da terra na região amazônica. No contexto do artigo citado, responda:

(a) Qual é o conceito de **capital social**, definido por Bourdieu (1986)?

(b) Por quais Estados se estende o “arco do desflorestamento”?

Já no artigo “Mudanças climáticas globais: a resposta da educação” Jacobi *et al.* (2011) apresentam um estudo sobre a relação entre as mudanças climáticas e a educação. Com base neste artigo, responda as questões a seguir.

(c) Na terminologia europeia, EE (*Environmental Education*, Educação Ambiental) é um conceito bastante distinto de ESD (*Education for Sustainable Development*, Educação para o Desenvolvimento Sustentável). Qual o diferencial entre esses dois conceitos?

(d) No Brasil, a pesquisa científica ligada à Mudança Climática está adquirindo posição estratégica nos programas de ciência e tecnologia. Há uma combinação original entre educação e conhecimento científico. A que tem sido relacionado o foco principal desses estudos?

Swallowing Rain Forest, Cities Surge in Amazon

The Amazon has been viewed for ages as a vast quilt of rain forest interspersed by remote river outposts. But the surging population growth of cities in the jungle is turning that rural vision on its head and alarming scientists, as an array of new industrial projects transforms the Amazon into Brazil's fastest-growing region.

The torrid expansion of rain forest cities is visible in places like Parauapebas, which has changed in a generation from an obscure frontier settlement with gold miners and gunfights to a sprawling urban area with an air-conditioned shopping mall, gated communities and a dealership selling Chevy pickup trucks.

Scientists are studying such developments and focusing on the demands on the resources of the Amazon, the world's largest remaining area of tropical forest. Though Brazilian officials have historically viewed the colonization of the Amazon as a matter of national security — military rulers built roads to the forest under the slogan "Occupy it to avoid surrendering it" — deforestation in the region already ranks among the largest contributors to global greenhouse-gas emissions.

Brazil has shifted away from colonization, but policies that regularize land claims by squatters still lure migrants to the Amazon. And while the country has recently made progress in curbing deforestation, largely by enforcing logging laws and carving out protected forest areas, biologists and other climate researchers fear that the sharp increase in migration to cities in the Amazon, which now has a population approaching 25 million, could erode those gains.

"More population leads to more deforestation," said Philip M. Fearnside, a researcher at the National Institute for Amazon Research in Manaus, an Amazonian city that registered by far the fastest growth of Brazil's 10 largest cities from 2000 to 2010. The number of residents grew 22 percent to 1.7 million, according to government statistics.

Of the 19 Brazilian cities that the latest census indicates have doubled in population over the past decade, 10 are in the Amazon. Altogether, the region's population climbed 23 percent from 2000 to 2010, while Brazil as a whole grew just 12 percent.

Various factors are fueling this growth, among them larger family sizes and the Amazon's high levels of poverty in comparison with other regions that draw people to the cities for work. While Brazil's birthrate has fallen to 1.86 children per woman, one of the lowest in Latin America, the Amazon has Brazil's highest rate, at 2.42.

Then there is the region's economic allure.

Sinop, a city of 111,000 people in Mato Grosso State, grew about 50 percent in the past decade as soybean farmers expanded operations there. Fiscal incentives for manufacturing promote growth in Manaus and satellite towns like Manacapuru and Rio Preto da Eva. Logging still provides the lifeblood for growing towns along BR-163, an important Amazon highway now being paved.

Elsewhere in the Amazon, the biggest linchpins for the fast-growing cities are major energy and industrial projects. The construction of dozens of hydroelectric projects, including sprawling dams that have drawn protests, are luring manual laborers from around Brazil to cities like Porto Velho, in Rondônia State, and Altamira, in Pará.

Here in Parauapebas, also in Pará, an open-pit iron ore mine provides thousands of jobs. Plans for additional mines here, supported largely by forecasts of robust demand in China, have lured many to this

corner of the Amazon in search of work. Just since the 2010 census, the city's population has swelled to an estimated 220,000 from 154,000.

"This entire area was thick, almost impenetrable, jungle," said Oriovaldo Mateus, an engineer who arrived here in 1981 to work for Vale, the Brazilian mining giant. That was about the time that the authorities cut a road through the forest, making the settlement of Parauapebas feasible. By the early 1990s, he said, it had muddy roads, brothels and more than 25,000 people.

"Now, Brazil's future is in Parauapebas and other cities of the Amazon," said Mr. Mateus, 62, who heads the city's business association and owns a company that leases mining equipment. He boasted that on some frenetic days, as many as two homes are built each hour to meet surging demand in the city's settlements.

Indeed, the streets of Parauapebas pulse with vitality. People shout to be heard along Rua 24 de Março, a traffic-clogged thoroughfare reverberating with the buzzing of motorcycle taxis, Pentecostal preachers bellowing warnings of sin and car stereos blaring eletromelody, the thumping electronic music style popular in this part of the Amazon.

Venture to the outskirts of Parauapebas, and slums of wooden shacks stretch to the horizon. One area where squatters have put down stakes is called Nova Vitória. With about 1,200 such homes, it is a magnet for strivers.

"I came here because the economic conditions are strong," said Francisco Amorim da Silva, 20, who arrived in August from Marabá, another Amazonian city. Already, he has a small store selling basic foods like rice and beans and household items like laundry detergent.

Asked how much investment it takes to start such an operation, Mr. Amorim da Silva whipped out an iPhone and did the math, calculating the cost of a barren lot, building materials and a bit of start-up capital, which he said he obtained from selling a used Honda motorcycle. "Four thousand reais," he replied, or about \$2,000.

Some researchers have argued that in addition to allowing migrants to raise their living standards, migration to cities in tropical countries might actually reduce forest loss by depopulating certain rural areas, allowing tropical forests to regrow. But others contend that the migration may increase deforestation by permitting cattle ranchers, already responsible for razing big portions of forest, to acquire lands held by small cultivators.

The soaring population growth in some cities in the Amazon — called the "world's last great settlement frontier" by Brian J. Godfrey, a geography professor at Vassar College who is the co-author of "Rainforest Cities" — is intensifying an urbanization that has been advancing for decades. For more than 20 years, a majority of the Brazilian Amazon's population has lived in urban areas.

"It's great that people are moving out of poverty, but one of the things we need to understand when people move out of poverty is there is a larger demand on resources," said Mitchell Aide, a University of Puerto Rico biology professor, whose research has shown that deforestation has occurred on a larger scale than reforestation in Brazil's Amazon over the past decade.

Such environmental worries seem far from the minds of those who arrive here in Parauapebas. These days, a train comes three times a week from Maranhão in northeast Brazil, delivering hundreds of people each time. On a recent humid night, Maria Antonia Santos, 34, arrived with her six children from Zé Doca, a city more than 16 hours away.

As she lugged her family's possessions in plastic bags, she explained her motivation: "I was told this is the best place in Brazil to start on life again."

ROMERO, Simon. Swallowing Rain Forest, Cities Surge in Amazon. The New York Times, 24 Nov. 2012.

1. (2 pts.) – **Com base no texto acima**, responda as perguntas a seguir, em Português.

(a) O Brasil tem feito progressos no combate ao desmatamento. Cite dois fatores que justificam esses progressos no combate ao desmatamento?

(b) De acordo com biólogos e pesquisadores do clima, o que poderia afetar tais progressos?

2. (2 pts.) – A região amazônica tem sido um grande pólo de atração de migrantes, como é o caso do Sr. Francisco Amorim da Silva, 20 anos, que veio para a cidade de Marabá, motivado pelas condições favoráveis da economia local.

(a) O Sr. Francisco Amorim da Silva já possui uma pequena loja. O que vende a loja do referido senhor?

(b) Explique como o Sr. Francisco Amorim da Silva chegou ao valor de quatro mil reais, necessários para a implantação de seu pequeno comércio.

3. (2 pts.) – O professor de biologia, Mitchell Aide, da Universidade de Porto Rico, mostrou em sua pesquisa que o desmatamento ocorreu em maior escala do que o reflorestamento na Amazônia brasileira na última década.

(a) Explique a justificativa do professor Mitchell Aide que corrobora com tal afirmação.

(b) O que o autor do texto quer reforçar ao citar a chegada a Parauapebas da Sra. Maria Antonia Santos, de 34 anos, com seus seis filhos, procedente da cidade de Zé Doca, Maranhão.

**HUNTING PRACTICES AMONG THE AWÁ-GUAJÁ: TOWARDS A LONG-TERM ANALYSIS OF SUSTAINABILITY
IN AN AMAZONIAN INDIGENOUS COMMUNITY**

Indigenous Reserves have played an indispensable role in maintaining forest areas in the Neotropics. In the Amazon there is a clear correlation between these reserves and the presence of forest cover; however, the simple presence of uninterrupted vegetation is no guarantee for the conservation of biodiversity, especially where hunting is practiced. This study describes hunting practices among the Awá-Guajá people from 1993 through 1994, also identifying sociocultural, technological, and demographic changes that have influenced their resource acquisition strategies over the last two decades. The data was obtained through ethnographic fieldwork, recording 78 days of foraging returns, with follow-up visits through 2010. This work provides useful information for an effective diachronic analysis of hunting in this community, by revealing foraging patterns of the early to mid-1990s, and describing community transformations over the last two decades in this locale.

PRADO, H.M.; FORLINE, L.C.; KIPNIS, R. Bol. Mus. Para. Emílio Goeldi. Ciênc. hum. [online], Belém, v.7, n. 2, p. 479-491. 2012

4. (2 pts.) – Com base no texto acima, responda as perguntas a seguir, em Português.

(a) Qual a relação citada pelos autores entre as reservas indígenas e a conservação da biodiversidade?

(b) O que os autores investigaram na comunidade Awá-Guajá para compor uma análise de sustentabilidade?

Why Hydropower is Not Clean Energy?

Hydropower is generally presented as “clean energy,” at least from the perspective of global warming. Of course, hydroelectric reservoirs are well known to have other severe impacts, such as displacing human populations, flooding terrestrial ecosystems and radically altering aquatic ones. Unfortunately, greenhouse-gas emission represents a significant additional impact of many dams, especially in the tropics. The hydropower industry has reacted strongly to disparage these findings, but successive confirmation of the results makes this resistance harder and harder to justify.

Methane accumulates in the water near the bottom of the reservoir because the water column is thermally stratified (generally at a point less than 10 m below the surface), such that the colder deep water does not mix with the warmer surface water. Since the deep water (hypolimnion) has virtually no oxygen, decomposition ends in CH₄ rather than CO₂. Organic matter undergoing decomposition comes both from what was originally present in the vegetation and soil before the reservoir was formed and from carbon that enters the reservoir each year, one example being from the soft vegetation that grows on the mudflats that are exposed annually when the water level is drawn down, only to be flooded again when the reservoir is refilled. Unlike a natural lake where an outlet stream draws water from near the surface, a hydroelectric dam is like a bathtub where one pulls the plug at the bottom—outflow is through turbines and spillways that are located at depths where the water is loaded with methane. Although the emission is greatest in the first years after a reservoir is filled, the annual flooding of the drawdown zone can sustain an appreciable level of emission permanently (Fearnside, 2005). Since one ton of methane is equivalent to 21 tons of CO₂ in terms of impact on global warming, according to the conversions adopted under the Kyoto Protocol, this gas release gives hydroelectric dams a significant contribution to the greenhouse effect.

Omissions of methane from the turbines and spillways is the main reason why my estimates of greenhouse-gas emissions from Brazilian hydroelectric dams are more than ten times higher than the official estimates Brazil submitted to the Climate Convention in its national inventory (Brazil, MCT, 2004, p.154; 2006). It is relevant to mention that the official responsible for Brazil’s national inventory confessed in a singularly public way that ELETROBRÁS had been invited to “coordinate” the portion of the report on hydroelectric emissions specifically because the agency would produce a politically convenient result that would avoid international pressure for Brazil to reduce its emissions (Brazil, MCT, 2002; see Fearnside, 2004).

Philip M. Fearnside, disponível em: http://www.scitizen.com/future-energies/why-hydropower-is-not-clean-energy_a-14-298.html
(Com modificações)

5. (2 pts.) – Com base no texto acima, responda as perguntas a seguir, em Português.

(a) Onde se acumula o metano no meio aquático de reservatórios e por que ocorre tal acúmulo?

(b) As usinas hidroelétricas contribuem para aumento do efeito estufa? Explique por quê?
