The Taste of Rainforest

Causes and impacts of rainforest felling

Global Education programme manual from
The World in the Shopping Cart series

NAZEMI

world in the shopping cart

The World in the Shopping Cart

- The purpose of the global development education programmes titled The World in the Shopping Cart is to draw attention to the relationship between our consumer behaviour and seemingly unapproachable problems in the countries of the so-called "Global South"; that is to point out the interconnected nature of the developing and advanced countries through trade and consumption. The workshops explain selected issues (extreme poverty, poor working conditions, destruction of rainforests, etc.) to the students to give example of the products of our everyday consumption (cocoa, chocolate, coffee, cotton T-shirt or jeans, Coke, and others).
- The workshops also try to present more responsible, greener, and people-friendlier consumer alternatives such as Fair Trade, FSC (wood certification) and organic products.
- One of the principal objectives of the programme is to stimulate students to ponder over problems and their context, to critically evaluate the presented information and formulate their own opinions and attitudes.
- The educational series World in the Shopping Cart forms part of a homonymous campaign for responsible consumption.

Other workshops from the programme "The World in the Shopping Cart":

- **Coffee Way Too Strong.** Coffee and (un)fair trade
- **Bitter taste of chocolate.** Cocoa and child labour
- **Clothes Makes the Man... and Who Makes the Clothes?** Cotton and working conditions in the garment industry
- **The Taste of Rainforest.** Causes and impacts of rainforest felling
- **Coca-colonization.** On multinationals (not only) in developing countries
- **Banana Spots.** How the tropical farmers lives with pesticides
- **Over Troubled Water.** Water as a precondition of a development

The Taste of Rainforest
Causes and impacts of rainforest felling
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Content:

Instructions For Use

Dear teachers,
The task of this manual is to introduce to you one of the workshops of our cycle 'The World in your Shopping Cart.' The workshops advocate active teaching methods. They are made up of several connected activities, arranged to accommodate the three-phase E-R-R teaching model (evocation – realisation of what the information means – reflection). Basically, the workshops are built around group work (social and personal skills). Through hands-on activities, they ensure that learning is anchored in experience. There is also some work with texts (teaching and problem-solving skills). Discussion and attitude-related activities will develop citizenship and communication skills. Above all, the programme corresponds to cross sectional topics Education and Thought in a European and Global Context, and Environmental Education.
The workshops serve as a good introduction to these areas. The topics treated are very complex, and can therefore be expanded with their own activities.
The purpose of this manual is to provide a detailed methodology for holding one workshop from the cycle 'The World in the Shopping Cart,' and to support the methodology with information that will allow the teacher to spend as little of his or her own time as possible preparing the workshop.

Methodology
In the presentation of the methodology we have mentioned the objectives fulfilled by the workshop and its activities. Partial objectives then show up in concrete activities, as do lists of teaching aids.

Minimum two hours
The workshops are conceived for a minimum of two teaching hours, but it would be even better to extend the program and dedicate further time, especially to discussion. This is particularly attractive and useful to older students, because in addition to working on important communication skills, they have the opportunity – in the context of confrontation with others – to refine their own opinions and attitudes. The suggested schedule comes from the experience of teachers who have held the workshops numerous times. Nevertheless, the teachers who have tried the workshops for us led them in widely differing allotments of time (e.g. 1 × 2, 2 × 1, 2 × 2, 1 × 3teaching hours). So in addition to being possible within normal teaching hours, the workshops are well suited to special activity days at school.

Appendices
In the methodological part of the manual we have presented a complete list of teaching aids. The majority of them will also be found in the part entitled 'Appendices.'

- *The resources marked with an asterisk (photos, pictures, recordings) can be found in electronic form on our website: www.svetvnakupnimkosiku.cz/skoly/materialy. To make sure that the individual building blocks of the workshop mesh together, we have visually differentiated the information in the text.
- Important contributions from the teacher, which sum up what should stand out in the course of an activity.
- The windows for 'Transition to the next activity' facilitate the fluent progress of the workshop.

Documentation has been structured in three kinds of text field: the main text on a coloured background is supplemented by the text frames, which give illustrative examples or relevant details. The bullet points in the margin are designed to orient you in the main text by summarising the basic message of the corresponding section of text. The bullet points allow a quick reading of the text when you are repeating the workshop, and you can add to them yourself.
We hope that these materials will be a dependable guide to some aspects of our globalised world, and that they will inspire you to further develop these topics with your students. We invite you to send suggestions for improvement, as well as additions and information for the activities, to this address: vzdelavani@nazemi.cz.

The Taste of Rainforest

Causes and impacts of rainforest felling

TheTaste of Rainforest

Workshop objectives:

Knowledge:

- Students define the term "primeval forest", primeval forests are not only tropical rainforests.
- Students get a grasp on the causes and consequences of the destruction of the world's primeval forests.
- Students identify consumer alternatives of Fair Trade and FSC.
- Students explain environmental and social implications of the destruction of primeval forests.
- Students put the issue of a decrease in the size of primeval forests in context with our consumer behaviour.

Skills:

- Students use imagination and the mind's eye.
- Students work in a group.
- Students present the results of their group.
- Students defend a certain position.

Attitudes:

- Students adopt a standpoint on the issue of destruction of the environment – rainforests.
- Students express and defend their attitude towards various causes for the felling of rainforests.

Spatial requirements:

At the beginning, form a circle from chairs (one chair per student) in the middle of a room. In Activity 5, three groups work separately. They should all have enough space.

Group size: 12 to 20 students

Duration: 100 to 130 minutes

Resources:

- sheets of brown paper
- strong felt tip pens of various colours
- printed text of imagination
- CD with sound of the rainforest*
- CD-player
- wall map of the world
- "Characters" cards (*Appendix to Activity 3*)
- colour stick-it notes
- chart "What is your relationship to primeval forest" drawn on a large sheet of paper (*Appendix to Act. 3*)
- data projector
- computer
- presentation of deforestation photos (potentially, you can have the photos printed)*
- info-sheet to the presentation (*Appendix to Act. 4*)
- printed instructions for the triple activity (*Appendix to Act. 5*)
- foodstuff chart (*Appendix to Act. 5a*)
- set of packages from products having some relation to primeval forest (see Appendix for their list)
- cut-out comic strip cards (*Appendix to Act. 5a*)
- assignment of the game Not to the slum! (*Appendix to Act. 5a*)
- Profit – Loss cards (*Appendix to Act. 5a*)
- around 20 newspaper sheets
- dice
- info-materials on Fair Trade*
- 31 cards of the Black Peter game (*Appendix to Act. 5b*)
- fliers on FSC*
- FSC pencil
- printed article on aluminium (roughly 5 copies) (*Appendix to Act. 5c*)

Items marked with an asterisk can be accessed from the website.*

Name of activity	Type of activity	Objectives/information	Duration
1. When you say "primeval forest"	Mind map	Evoking images of primeval forest	10–15 minutes
2. Primeval forest field trip	Controlled imagination	Developing imagination, hidden information on the structure of a rainforest	10 minutes
3. What is your relationship to primeval forest?	Map work and role activity	Searching for global connections	15–20 minutes
4. Flight over rainforest	Presentation of aerial photographs	Rate of felling of rainforests	10–15 minutes
5. Triple activity	Group work, discussion	Obtaining more in-depth information on three main causes of the destruction of primeval forests	25–35 minutes
a) Farming	Sorting of packages, composing a comic strip, dice game	Impact of farming, soy, oil palm and Fair Trade	
b) Forestry	Black Peter card game	Tropical timber and wood certification system – FSC	
c) Extraction	Text work, poster of connections	Extraction of raw materials, hydroelectric power plants, dams and their environmental impacts	
6. The taste of rainforest?	Synthesis and discussion		30 minutes

Shorter version

If the whole class participates, i.e. roughly 30 students, the activities take more time. If you do not have enough time, you can divide the programme or leave some items out. As far as the objectives of the programme are concerned, Activities 2 and 4 can be omitted – both serve the function of visualizing the issue. It is possible to devote one lesson to the evocation of primeval forest and to the first search for connections to it (Activities 1–3). This can be complemented by more detailed map work and study of the occurrence of different types of forests and primeval forests. The second lesson can address case studies in Activity 6.

Extension

The programme does not deal with primeval forest either in terms of biology, ecology or geography. It is therefore suitable for students or pupils who are already familiar with the essentials of this topic. You can incorporate it in a day-long project. Follow-up activities can derive from a further elaboration of the topics in the Triple activity – farming, extraction of mineral resources and construction of dams or timber felling – by dint of case studies dealing with specific countries, crops or minerals. Further enrichment can be the attractive issue of cultures of the rainforest Indians; however, be careful that they are not presented as a mere attraction, the "view of the other" needs be mediated. A suitable introduction into this topic is the activity Mother for sale, refer to Pike, G.; Shelby, D.: Cvičení a hry pro globální výchovu. Prague: Portál, 2000. This publication also includes a postural activity of primeval forest exploitation.

Activity 1: When we say "primeval forest"

Duration: 10–15 minutes

Resources:

- Sheet of brown paper for each group (at least A1) and a thick marker

Objectives

- Students remember what they already know about primeval forest.
- Student understand the notion of associations and try to form them.
- Students define the term "primeval forest".

The teacher learns about the hitherto knowledge of the students.

Steps:

- Divide students into groups, ideally of five. Each group chooses one student as a record-keeper.
- Give each group one large sheet of paper and one or more markers.
- Students write the word primeval FOREST in the middle of the paper. They link associations and knowledge related to primeval forest in a random order.
- Students should not "censor" their ideas and record everything that occurs to them on the mind map.
- Terminate the activity by collecting all markers after roughly ten minutes. It is recommended to notify the students two minutes before the end of the activity.
- Give the students roughly three minutes to take a look at the mind maps of other groups.
- Write on the blackboard "What is a primeval forest?" and ask the students to tell you their associations. Write down whatever is mentioned.
- At the end, ask about the definition of primeval forest.

Important outputs:

- The most frequently mentioned associations relate to tropical rainforest. Primeval forests are however not only tropical rainforests.
- These days, a truly virgin forest is hard to come by. The term primeval forest therefore stands for an "ancient forest of a natural character".

Workshop activity tips:

- While listing the associations, it is not possible to write everything that the groups have on their mind maps. Equal space should be given to all groups. It is therefore necessary to have each group select for example five associations that they consider of key importance or the most interesting. Another option is to first write down three most immediate associations from each group (moisture...) and then three derived associations (danger...).
- When a group has more markers, the brainstorming is more fluent.
- Do not evaluate individual associations – the objective is not a competition for the most original observation, but rather evocation.

Transition to the next activity:

- "...now we have created a fairly colourful image of primeval forest... Would you like to see one? Some of us will maybe manage to but now we can at least undertake the trip in our fantasy..."

Duration: 10 minutes

Resources:

- printed imagination text (Appendix)
- CD with the sounds of rainforest
- CD-player

Activity 2: primeval forest field trip

Objectives:

- Students develop their imagination and visualization skills.
- Students describe the structure of a tropical rainforest.

Steps:

- Ask students to sit comfortably (on chairs or, if there is a carpet, on the floor) and to close their eyes. This will help them break free from the reality of a school classroom.
- Read the imagination text slowly.
- Play the forest sounds shortly before they are mentioned in the text.
- After you finish, stop for a while and then ask students to "come back" to the classroom and slowly open their eyes.
- Provide space for the first comments or potentially pose questions.
  - How did they enjoy the trip? Where was the primeval forest probably located? What feelings did they have from penetrating the rainforest underbrush? Did they detest anything? Did they look forward to coming back?
  - An important question that is concurrently a transition to the next activity: is there any connection between you and a rainforest?

Workshop activity tips:

Based on experience, you do not need worry about disturbing students. The individuals who like to disturb will be fed up after a while.

The activity was formed in line with the method of controlled imagination. If you wish to implement it thoroughly, refer to Pike, G.; Shelby, D.: Cvičení a hry pro globální výchovu. Prague: Portál, 2000.

Transition to the next activity:

- Ask the following questions: "Do you have any relationship to a rainforest?... And which?... (E.g. to which other forest do you have one?) And not to a rainforest? Because it is far away? Because you have never been there? This is one peculiarity of today's world that one is often bound with people or nature from another corner of the planet...!"

We will now deal with relationships to a rainforest on the examples of twelve people not only in the emotional sense, but also in a more practical, let us say, consumer-user sense.

Activity 3: What is your relationship to a rainforest?

Duration: 15–25 minutes

Resources:

- wall map of the world
- "Characters" cards (Appendix to Act. 3)
- chart "What is your relationship to the rainforest ?" (Appendix to Act. 3)
- stick-it notes
- pencils, markers

Objectives:

- Students name several types of use of tropical rainforests.
- Students search for global connections between the disappearance of primeval forests and our consumer behaviour.
- Students are able to locate things on the map.

Steps:

- Distribute cards describing the individual characters and stick-it notes cut to ca. 1–2 cm long stripes with one sticking end to the students (individuals or pairs).
- Students read about the character and situation, copy the name on the paper and think about the specific character's connection to primeval forest.
- In the meantime, stick the prepared chart "What is your relationship to the rainforest?" on the blackboard or on the wall. The chart must be minimum A1 format; the bigger, the better.
- Students then come to the map one by one, present their character to the others, and place the paper stripe with the name on the appropriate state on the map. Each student also expresses his or her opinion regarding the character's relationship to rainforest. If there is any, the students should explain why. Other students can make complementary comments.
- If the connection with rainforest is clarified, write the respective information into the chart: e.g. K. Mansa, for her rainforest is A HOME, SOURCE OF FARMLAND. M. Servía, his furniture is made of TROPICAL WOOD, etc.

Important outputs:

- One manifestation of globalization is the interconnectedness of phenomena across the globe.
- The relationship of some of the characters is an example of this.*

Workshop activity tips:

- The "first set" (see *Appendix to Activity 3*) includes twelve characters. If necessary, this set can be supplemented by other characters. We do not however recommend using all of the characters because the presentation stage alone then takes too long.
- In general, a sufficient pace must be maintained – if students cannot immediately locate the correct state based on the character information, do not "torment" them. Either the others or you can give them a hint.
- If students can explain the essence of the connection of their character to the primeval forest, agree on some short explanatory formulation that will be written in the chart. Have some suitable phrase prepared in case that the students correctly understand the relationship but cannot quickly and briefly formulate it (for optional phrases see the chart).
- If you have a map on which you can write, it is possible to connect the paper with a name of the characters with the primeval forest (a line by a wipeable marker) for clearness apart from writing the connection in the chart.

- What becomes clear at this stage depends largely on the students. They will probably uncover the majority of connections, especially with persons living directly in a rainforest region or with consumers of tropical products. Conversely, the relationship between biofuels, beer cans and senior citizens consuming meat will probably remain unresolved. For all of the important outputs see the concluding activity.

Transition to the next activity:
- What do the uncovered connections have in common? The majority of characters benefit from rainforest in some way. Some of these connections share in the felling of rainforests...

Duration: 10 minutes

Resources:
- data projector and computer
- presentation of deforestation photographs*

Activity 4: Flight over rainforest

Objectives:

- Students visualize the scope and intensity of felling of primeval forests in different parts of the world.
- Students name various categories of exploiting rainforest regions (industrial farming, small farming, cattle breeding, hydraulic structures).

Steps:

- Project aerial photographs of the same locations taken at different dates.
- Information that can be used to complement the presentation can be found in the reference materials or in the Appendix titled Information for the presentation.

Important outputs:
- A portion of rainforest the size of a football pitch disappears every two seconds.
- If the current speed of rainforest felling is maintained (30 football pitches a minute), the Earth will have no rainforests by 2050.

Workshop activity tips:

- You can definitely supplement the presentation by your own photographs or you can opt for just one region. The following pictures are intended for free use: ftp://edclxs25.cr.usgs.gov/UNEP/ernste/AtlasHighResSamples.
- Tell students where they can search for these and other photographs.

Transition to the next activity:
- "...we could see how the human activity shows on the face of the Earth – cattle breeding, plantations, dam construction and land inundations. Let us now look closer at human activities that are among the principal causes of deforestation. We will look at farming, mining industry and timber felling. Maybe we will succeed in uncovering the connections of the remaining characters."

Activity 5: Triple-activity

Duration: 5–10 minutes

Resources:

Farming:

- basic instructions (*Appendix to Act. 5a*)
- set of packages (for their list refer to *Appendix to Act. 3*)
- chart to be filled in
- cut out comic strip cards
- a cover with the instructions for the Not to a slum! game (*Appendix to Act. 5a*)
- a cover with PROFIT cards
- a cover with LOSS cards for the Not to a slum! game (*Appendix to Act. 5a*)
- ca. 20 newspaper sheets or any other paper to mark the play fields
- dice

Forestry:

- basic instructions (*Appendix to Act. 5b*)
- set of cards for the Black Peter game (*Appendix to Act. 5b*)
- fliers informing on FSC (FSC pencil for a winner)
- sheet of brown paper and a marker

Extraction:

- basic instructions (*Appendix to Act. 5c*)
- sufficient number of copies of the article (for all group members)
- a large sheet of paper (ideally A1)
- a set of 4 thick colour markers

Objectives:

Knowledge-based

- Students acquire more in-depth information on the social and environmental impacts of tropical agriculture, felling of tropical timber, mineral extraction (bauxite, specifically) and construction of dams.
- Students explain the connection between the consumption of various raw materials and products and the felling of rain forests.
- Students define and explain consumer alternatives of FSC (certification of eco-friendly forest management) and Fair Trade.

Skill-based

- Students interpret information from written and drawn texts.
- Students work in a group.

Steps:

In this final activity, students work in three groups. Each of them will work on one cause for deforestation in detail:

- farming (searching for information on products, composing comic strips, Not to a slum! game),
- timber felling (Black Peter game, work with information materials),
- mineral extraction (work with text, drawing of a poster).

The groups work according to written instructions but it is nonetheless necessary that the instructors engage with them the whole time, encourage, direct or help them.

- Divide students into three groups.
- Distribute them the necessary sets of assignments and teaching aids prepared in advance.

"Farming" group:

- Students first look at the packages of the individual products and fill in the prepared chart in terms of their contribution to the shrinking size of rainforests.
- Meanwhile, other students compose two different comic strips on palms and soy.
- When students finish the task, give them a chart with a proposed solution for comparison.
- In the meantime, prepare the play field for the Not to a slum! game. Place as many newspaper rows (formed by nine newspaper pages) on the floor as there are student pairs. Mark one side as a slum and the other as a rainforest river.

- When students have finished with the previous tasks, they go on to play the Not to a slum! game together.
- Based on the information from the cards of the Not to a slum! game, students formulate advantages of the Fair Trade system.

  (For more information refer to the assignment for students).

"Forestry" group:

- Students read the game instructions, distribute the cards and play the Black Peter game. A pair of cards forms the difference between FSC eco-friendly forest management and uncertified felling.
- If you can get hold of them, give the winner a prize – best would be a FSC pencil.
- When only Black Peter is left, the game is over. Students copy some environmental and social criteria for FSC wood from the play cards on the prepared sheet of paper.
- Let the activity go on for as long as there is still time for the final discussion.

"Extraction" group:

- The task of students is to read an article on the extraction of minerals and dam construction (Appendix).
- Students sort the information acquired from the text in line with the instructions.
- Then they proceed to preparing the poster on which they will attempt to pictorially express the issue of bauxite extraction according to the article in greatest detail possible.

Important outputs (summary) (details in the reference materials):

See below.

Workshop activity tips:

The "Extraction" group should not have more than six students so that everyone can participate in the drawing of the poster. The "Farming" group can have more students because it has probably the most tasks to be shared.

Be careful that the "Forestry" group players put away the card pairs only after they have properly explained the described difference between the cards to others.

Make sure that with the "Farming" group everybody is informed about the content of the Profit – Loss cards.

If the programme is led by two instructors, one can take care exclusively of the "Farming" group and the other one can alternate between the other two groups.

Transition to the next activity:

- Ask students to sit again in a circle. You can put the map and the "What is your relationship to rainforest?" chart in the centre of the circle.

Activity 6: The Taste of Rainforest (Synthesis)

Objectives:

Knowledge-based

- Students sum up the essence of our consumer relationship to rainforest.
- Students consider global responsibility of consumers.
- Students suggest alternatives for a responsible consumer.

Skill-based

- Students present the group work.
- Students exercise their attention and supplement the missing information.
- Students adopt a standpoint and discuss it with others.

Steps:

- Start with the "Extraction" group that has drawn the poster. The group hangs the poster or spreads it on the floor so that everybody can see it.
- At this moment, it is possible to verify that the message has been expressed understandably. All other students try to figure out what the poster shows, what the individual pictures or used symbols mean.
- Students can ask the poster authors only questions that are answered by "yes" or "no". For example: "*Is that a waterfall?" No. So does it have to do something with water? Yes. Is it a dam? Yes. And the dam somehow relates to the tin? Yes...*" etc.
- Toward the end, let the representatives of the characters explain what still remains unclear or ask questions yourself.
- When the other groups are familiar with the problems of bauxite mining, remind everyone of the Belgian poet and clarify his connection to rainforest (unless it has been already explained).
- A short discussion of what could this character do to avoid participating in the felling of rainforests due to bauxite extraction (drink tap beer, buy bottled beer, recycle the tin).
- Further progress of the debate depends on the concrete situation in the class. Give space to both remaining groups to present the others with what they have learned. The "Farming" group should show or at least explain the content of the comic strips and to report on the relationship between meat products and rainforest. Students have probably already heard about the unfitness of rainforest soil for intensive farming, and if not, stress this point. The "Forestry" group can enlighten others on the differences between conventional forest management and FSC and explicate the impacts of illegal felling for the developing countries.

Important outputs – problems::

"Extraction" group:

- Europe has relatively limited resources of bauxite and the majority of aluminium we use is therefore imported, frequently from tropical regions.
- Energy for the production of aluminium is one of the reasons for massive dam constructions on rivers in the Amazon (but not the only one, for more see reference materials).
- The construction of dams results in the displacement of thousands of people, disturbance of the water regime in the surrounding areas, obstruction of passage for fish and in their extinction.

"Forestry" group:

- Over a half of tropical trees are logged illegally depriving the developing countries of extraction revenues.
- Among the problems of conventional forestry and trade with timber in the Czech Republic and abroad is instability of forest stands (outplanting of monocultures) and unsustainable felling methods (clear cutting, depletion of site nutrients...).

"Farming" group:

- The disappearing rainforest is a home for thousands of people. The extracted plots are sources of farmland.
- Low purchase prices of forest crops, among other factors, force farmers to expand the areas under cultivation at the expense of rainforest.
- Rainforest soil is not fit for traditional farming because it is quickly exhausted. This speeds up the process of destruction, too.
- Soy is added to a whole series of industrially produced foodstuffs. It is predominantly imported from Latin America.
- An absolute majority of soy imported to Europe is used as animal fodder.
- Palm oil has a broad range of use on the one hand (deep frying, ingredient used in many foodstuffs, cosmetics, biofuels), but its cultivation is one of the principal causes of deforestation in Southeast Asia.
- The impossibility of making ends meet by farming drives the rural population to abandon their fields and move into the city slums.

What else should be mentioned:

- Tropical rainforest is a significant stabilizer of the global climate because it binds large quantities of CO_2.
- By destroying rainforest we deprive ourselves of material for primary and applied (chiefly pharmaceutical) research.
- Rainforest is not damaged only by farming, whose products are designed for export, but its condition is seriously exacerbated also by local people driven by poverty to "survive by any means". Apart from this, locals often fell the trees for firewood. Question: Are we responsible for their poverty?

Important outputs – consumer alternatives

- People – as consumers – can have surprisingly strong, although commonly indirect, connections to a tropical rainforest.
- The type of goods originating in tropical regions (or the fact of whether we buy them or not) corresponds to our "relationship to a rainforest".
- This relationship or, rather, impacts of this reality on the rainforest can be significantly improved:

"Farming" group:

- Preferring Czech or European farm products and Fair Trade variants of crops that are not grown in our latitudes (e.g. coffee, cocoa, bananas);
- Preferring meat products that do not originate from animals fed by soy from the tropical countries (organic meat, freshwater fish etc.) or potentially limiting our meat consumption in general;
- Reducing our consumption of palm oil (this is difficult due to low traceability of information on the products), if we opt for biofuels, then only produced from crops that are not cultivated at the expense of primeval forests.

"Forestry" group:

- Not buying products from tropical wood. If so, then only FSC-certified products.

"Extraction" group:

- Cutting down on our consumption of products from mineral resources. Mostly those highly likely to have originated from the underlying rocks of rainforest, such as bauxite. This means giving preference to packaging that does not contain aluminium or does contain it but it is possible to separate and recycle it (this is especially not true about Tetrapak drinks).

Workshop activity tips:

- At the conclusion of the discussion and the entire programme, the chart of persons and relationships should be completed (see Appendix).
- The progress of the discussion depends on the willingness of students to communicate and on how much they have become attracted to the topic of rainforests.
- It is recommended that the discussion does not resemble an oral exam. It is for example possible to first ask the "Forestry" group who has won, what has he or she got, what does the difference of a FSC pencil consist in. This leads you to the topic more naturally.
- The group of farmers quickly understand that all products have some connection to the rainforest, so they have a tendency to simply answer "yes" everywhere and not rack their brains over the reasoning. Here you need to lead them to the actual connections by detailed questions, chiefly in the case of meat products.
- Ask students to confront the impact of various products containing the same ingredient (soy meat versus meat "fed with soy"; palm oil in chocolate versus palm oil in the fuel tank).
- Attention needs be paid for students understanding of the difference between e.g. Fair Trade coffee and ordinary coffee. If necessary, remind them of the chart, e.g. while playing the Not to a slum! game.
- If it is not mentioned during the presentation of the characters, emphasize that these are fictitious characters on which we show concrete problems and material flows in globalized economy. Most of us share in the problem with the majority of the characters: Coffee is not consumed only by Americans, soy as fodder is not used only in Italy etc. When searching for answers to the questions of what could they do to behave more considerately toward a primeval forest, students will surely be aware that the same problem applies to them, too. It is therefore not necessary to keep stressing this point, but it is possible based on your consideration.
- To conclude, you can hand out information materials on Fair Trade and FSC to those who show interest.

Activity 2

Text: You are in a place where you feel pleasant and safe..., find a comfortable position..., and completely relax... listen to the sounds that come from outside..., sounds in this room...

Imagine yourself leaving this room and flying upwards, toward the sky..., you look at the school/or any other building visible deep below you from the bird's eye view..., it is growing smaller... and smaller, you see outlines of towns and villages, hills and mountains..., rivers..., you recognize the Czech Republic by the outlines of the border mountain ranges..., it is still smaller and smaller..., you recognize Europe... and the huge area occupied by Asia in the East... but the wind carries you toward the South-West, the landscape below you passes quickly and the view keeps changing. ... The grey and the azure of the ocean is suddenly replaced by yellow and green areas… You begin to descend..., you are not familiar with the landscape below you... You descend through the gaps between the huge branches..., your feet have touched a soft and flexible soil... There is a strange ghostly gloom..., the stem of a tree next to you rises to the thick green canopy above your head… The rays of sun flash through the foliage… Lianas hang all around you. Moss and lichen cover everything by soft green velvet. Various species of mushroom and peculiar-looking plants are scattered over the silky cover.

You are aware of the peace around you. The rainforest seems mysterious and slightly scary. You gradually start realizing the surrounding sounds – the shrieking of blue and yellow parrots, a quarrel of monkeys high up in the branches. The forest is bustling with all types of insects – butterflies, spiders, centipedes – whose size astounds you. The wings of the butterflies are larger than the palms of your hands… The polypod that ascends the liana is longer than your foot.

You pluck up courage and carefully and prudently move ahead through the rainforest. You avoid the hanging lianas and step over roots. Your T-shirt begins to stick on your back and you hear humming in your head from the hot and humid air. You can smell the heavy earthy odour that is only occasionally subdued by the aroma of some flower.

Suddenly you feel as if something is lifting you and you get off the ground towards the green crowns. The light is brighter. You are among the lower branches of the trees. Here, high above the ground, is another world. The forest mice and monkeys swing and jump between the trees. You can see a creeping jaguar from above and the three-toe sloth hanging down from a branch next to you. You keep going up until you get to the very top, into the thick canopy where the robust and spreading branches terminate in a flood of colourful blossoms.

The sky above you is of an azure colour and you feel the heat of the tropical sun at the crown of your head. You keep ascending higher and higher and you start getting the view of an endless ocean of green below you… You look around… Now and then, the surface of a river meandering between the trees glistens in the distance.

The scattered thin streaks of smoke rising between the tree crowns indicate the Indian villages. And the threatening gloomy cloud far on the horizon is evidence of the dark side of the tropical rainforest story.

Activity 3

CHARACTERS – basic set

Tsinamo Hui, Amazonia

Since he was born, he has been at home in a rainforest together with his tribe. Now he is however threatened with being displaced because the customary territory of the tribe is slated to go under water of a new dam...

Kikki Mansa, Côte d'Ivoire

She has a small cocoa farm. The purchase price of cocoa beans is very low so she and her entire family must work harder. Next year, they will fell further stretches of rainforest to have more plots for growing cocoa...

Francesco di Reggio, Palermo

A pensioner. He spends his old age in the country. He enjoys inviting his numerous friends for curing and grilling meat...

Joost Nuijten, Bruges

A poet. He is passionate about roving on the coast days on end just with a little bit of food and several tins of splendid Belgian beer....

Mikhail Petrovich Valinskiy, Saint Petersburg

He is a vegan and absolutely does not wish to cause harm to animals. Therefore he is happy that alternative foodstuffs are now becoming available even on the Russian market: apart from soy meat now even soy yoghurt and soy lard...

Arnošta Vopičková, Zastávka u Brna

A pensioner. We have not received any news of her recently apart from her having received a deep fryer for Christmas from her grandchildren and searching for some suitable frying oil...

Mauricio Freitas, Mato Grosso

Former fisherman – he is glad that he got a job on the construction of a hydroelectric power plant that will supply electricity to another factory for the processing of bauxite. He could no longer be a fisherman because the dam on his river caused a large dieback of fish...

Bill S. Folding, Iowa City

He is a workaholic and drinks six and more cups of coffee every day. This is why he has become a great connoisseur – he is most fond of Ethiopian coffee...

Uwe a Uschi Winter, Hamburg

They have learned about the phenomenon of biofuels and had the engine of their family car converted to run on vegetable oil that they now use instead of petrol...

Ursus maritimus, polar bea, Greenland

Hunts for fish and seals which also requires jumping from one ice flow to another. Only lately, it has seemed to be still more difficult, either he is growing old or the gaps between the floes have been growing wider...

Miguel Servía, Sevilla

He has just equipped his hacienda with new outdoor furniture. He is really happy about it. The wood that does not show any growth rings makes a very nice aesthetic impression and it does not require any finishing...

Charlotte Diehl, Toronto

She owns a small down town confectionery. Her favourite sweet is definitely a chocolate covered bananas...

CHARACTERS – complementary set

Heather Graville, Bristol

She thinks she is fat and so she is on a diet. She is busy. At present, she is litigating with the insurance company because of a too small compensation for her house inundated during the June 2007 floods.

Jan Novák, Hlavní Lhota

He owns a medium-size food-processing enterprise producing mainly potato crisps, crackers, roasted peanuts etc.

Ishikato Natushi, Kyoto

She suffers from a new incurable type of cancer. The doctors tell her not to lose hope because an intensive research for the cure is under way.

Olivia Freitas, Mato Grosso

A widow. She currently tries to get used to her life in a slum near São Paulo where she had to move after her native fishing village on the Itaipú river had been inundated by a dam.

Dendrobates amozonicus,
(poison dart frog in English)

A poisonous frog that inhabits the tree crowns in the Amazon rainforest.

Izak Ben Kannan, Tel Aviv

At the moment, he is on a business trip to Brazil where he makes sure that the cows are slaughtered in a kosher way so that the beef can be freely distributed in Israel.

Charlie Donnut, New Orleans

Plays clarinet in a swing trio.

Ignácio Rocha, Mato Grosso

He works at a plantation where he grows crops for export. Apart from that he owns a small field for growing food for his own consumption.

Activity 3

The chart "What is your relationship to a rainforest" to be copied on a larger sheet of paper – for the basic set of characters

Name	*Key words*	*(phrase formulation example)*
T. Hui	**Native inhabitant**	*Home, foodstuffs, medications, clothes*
Ch. Diehl	**Confectionery**	*Source of bananas and chocolate*
K. Mansa	**Cocoa beans**	*Source of farmland and livelihood*
Ursus maritimus	**Polar bear**	*Stabilization of climate change*
F. di Reggio	**Grilling**	*Soy as fodder*
M. Freitas	**Hydroelectric power plant, bauxite**	*Originally home, now work opportunity*
J. Nuijten	**Poet, beer in tins**	*Bauxite deposits*
W. S. Folding	**Workaholic, coffee**	*Coffee originates in a primeval forest*
M. P. Valinskiy	**Vegan, soy**	*Soy cultivation replaces rainforest*
U. and U. Winter	**Biofuels**	*Vegetable oil*
A. Vopičková	**Deep fryer**	*Palm oil*
M. Servía	**Furniture**	*Tropical wood*

Note: the list of packages to Activity 5a:

The list of foodstuffs can correspond with the keywords in the chart "What is your relationship to a rainforest".

The set of packages ought to include:
– something fried in palm oil (crisps)
– foodstuff containing palm oil (cheap chocolates, instant noodles, margarine)
– foodstuff that uses soy as emulsifier,
– foodstuff that has soy as one of its main ingredients (soy fat, soy meat, tofu)
– meat product, best would be beef meat, which does not have soy listed as additive
– ordinary banana
– ordinary coffee
– Fair Trade (FT) coffee,
– Fair Trade chocolate
– Fair Trade banana chips

Activity 4

PRESENTATION DATA

Forests cover one third of the Earth's surface but over the last 300 years, we have already felled one half of them.

The surface area of tropical rainforests at the outset of the 20th century was roughly 16 million sq. km. Today it is roughly one half of that.

Tropical rainforests take up approximately 6 % of the Earth's surface but form the habitat for 50 % of all animal and plant species.

Fig. 0 Map

The countries with the largest acreage of tropical rainforest are Brazil, the Congo, Indonesia, Peru and Colombia.

The largest uninterrupted rainforest can be found in Brazil, then in Africa in the surroundings of Congo River, in Northeast Asia, New Guinea and Madagascar.

Fig. 1–3 Brazil, state of Rondônia

Thirty percent of all tropical rainforests grow in Brazil. At the same time, Brazil also has the largest absolute numbers of deforestation. Already one fifth of the original acreage of the Amazon rainforest has been cleared.

The most severe deforestation occurs in the Brazilian states of Rondônia and the neighbouring Mato Grosso. Rainforest felling serves primarily for acquiring land for cattle farms and for agriculture, whereas more sustainable permanent crops, such as coffee or cocoa, are cultivated only on 10 % of the farmed land.

Fig. 4–7 Bolivia, the Santa Cruz region

Industrial farming occupies large swathes of the original rainforest. But even the local small farmers tend to expand their plots. The Amazon rainforest is covered by a relatively dense road network that services smaller plots of land. State-allocated plots usually fringe the official roads in a perpendicular or central manner (Fig. 7).

Fig. 9–11 Indonesia, the Papua region

Indonesia has the third largest acreage of tropical rainforest but second only to Brazil in its rate of felling. It is concurrently the biggest producer of palm oil in 2012, followed by Malysia. The rainforest is first made accessible by roads (Fig. 10) and then rectangular plantations of palm oil become established. The plantations present one of the major causes for deforestation in Indonesia.

Fig. 12–13 the Itaipú dam

In the early 1970s, the Itaipú dam was built on the border between Paraguay and Brazil in the close vicinity of Argentina. The dam enabled urbanization of the region thanks to a hydroelectric power plant which supplies both states with electrical power (91 % of the power consumption of Paraguay and 25 % of Brazil's electricity needs). The three countries – Paraguay, Brazil and Argentina – are distinguished by diverse policies in rainforest conservation.

How fast is it vanishing?

Annually, deforestation amounts to around 12–15 million hectares.

The pace of deforestation can be likened to the surface area of one football pitch disappearing every second. It is estimated that if deforestation continues in this speed, we will inhabit a world without rainforests outside the boundaries of protected areas by 2050.

Adapted from www.na.unep.org.

Activity 5a

INSTRUCTIONS for the FARMING group

Did you know that the largest proportion of rainforest is cleared to make space for pastures and farmland?

First, read the three tasks stated below to know what is expecting you. There are many things to be done so ***it is recommended to distribute the tasks*** *and tell each other what you have found out.* ***You will then play the concluding game "Not to a slum!".***

Steps:

1. *A collection of commonly available products is lying in front of you. In your opinion, can the production of some of them have something in common with the felling of rainforests? Fill in the prepared chart – write the individual foodstuffs (products) in the first column, numerical evaluation (0 to -2) of their share in deforestation in the second one, and explain your choice in the third column.*
2. *Some relations of today's globalized world can be surprising. Open the envelope No. 2. Inside you will find pictures from 2 comic strips narrating the story of two crops. Your task is to order the episodes correctly. You can also come up with fitting titles for both stories.*
3. *The game instructions are in the third envelope. Follow these instructions while playing it.*
4. *While completing the tasks, concentrate on the following information:*
   - *Anything by which farming contributes to the destruction of rainforests;*
   - *Involvement of farmers in the Fair Trade system and its impact on their lives (use information from the "profit" and "loss" cards). If possible, make notes that you can use later in the final discussion.*
   - *Come back to the initial chart once more and think again whether your assumption of the connection with rainforest felling applies or does not apply to all products of one kind (are there, for example, differences between the individual types of chocolate?).*

FARMING INSTRUCTIONS – RULES of the "Not to a slum!" game.

1. *Form couples. Each couple represents one South-American family who lives in a small settlement in the middle of a rainforest. As local farmers, you depend on water sources. The aim of the game is to stay close to the river springing from the rainforest and providing you with the necessary water and not to end up in a slum – a poor people neighbourhood in a big city.*
2. *Many papers – play fields – are laid out on the floor. Slum is the last paper field on one side. At the other end, over the river, is your village. Every sheet of newspaper functions as one play field in the game that you are going to play.*
3. *The representative of the couple takes a position on a field in the middle. Others stand along the fields so that you can see.*
4. *The other person from the couple, who is not standing on a field, throws the dice. If the dice shows 1 or 3, draw a card from the PROFIT envelope. If the dice shows 2, 4, 5 or 6, draw from the envelope marked LOSS. Read the message on the card out loud to the others. Move by the specified number of fields either in the direction of the river or toward the city and then hand over the dice to the next couple.*
5. *It is important that you read the cards of the others. You can jot down the information you learn about farming during the game.*
6. *The game is over once one of the players reaches the city. This means that he or she has ended up in a slum, without a job, electricity and often even without water and in disastrous living conditions as a result of a bad situation in agriculture. (The game is also over if you have drawn all of the cards from one of the envelopes. In such a case the one who is closer to the RIVER wins.)*

Activity 5b

INSTRUCTIONS for the FORESTRY group

Did you know that 50 % of tropical wood imported to the EU has not been logged legally?

FSC (Forest Stewardship Council) is an international not-for-profit organization and simultaneously a certification system that tries to contribute to a more sustainable management in forests all over the planet. FSC branches grant FSC trademark to forest owners and wood-working plants that comply with a stipulated set of criteria. Can you guess which criteria they are? What does it mean to manage a forest in a sustainable manner?

First read through the instructions to know what to expect.

To learn more on the issues of rainforest logging, the FSC alternative and others, play the Black Peter game. Then write down what you have learned on a sheet of paper.

Steps:

1. ***The aim of the game*** *is to get rid of all your cards and not to end up with Black Peter in your hand at the end of the game.*
2. *The game is played with card pairs and one card marked "Black Peter". The pairs are formed by cards which express the opposite. One (marked with the FSC logo) describes forest management rules of the FSC system. The second card in a pair characterizes illegal practices of logging and the consequent processing of timber.*
3. *Deal out an equal number of cards to everyone, if possible. Read through the cards you have got. If a player finds a pair, he can set it aside but only after he or she has explained the difference in the use of forest to other players. After the other players have understood the difference, the player can set the pair aside. If you have any questions, always ask.*
4. *The player on the left hand side of the person dealing out cards starts. Each player pulls a card from the fan of cards without seeing them and then puts it among his or her other cards.*
5. *If the player acquires a pair after having selected the card, he or she can set it aside in line with the conditions specified above.*
6. *The game proceeds in the same manner. The winner is the player who has first got rid of all of his or her cards. This is not the end of the game yet. The players continue laying out pairs until only the player holding the Black Peter stays in the game.*
7. *Now look at the pairs set aside again and write down what you think the crucial principles of FSC are and divide them into two categories. You can use the attached fliers as well. One category are social and the other environmental principles.*

Paid fairly?

Forest plots are **protected against illegal felling**. This means that trees are not logged in nature preserves and that the timber is well paid. The native population is thus not deprived of the profits.

Paid fairly?

Illegally logged and therefore insufficiently paid timber (in the Amazon, up to 80 % of felled trees) deprives the developing countries not only of irreplaceable natural wealth, but also of income to which they are entitled.)

And the native peoples?

Legal and traditional rights of the indigenous population to own, use, and farm the land and use its resources **must be respected**, all measures and damage compensations must be authorized by the inhabitants in a free and informed manner.

And the native peoples?

Extensive logging of tropical wood often **disrespects the right of the indigenous people** to use the rainforest as their home and source of everything they need for a living in the long run.

Domestic or tropical?

It helps promote the use of **tree species that can be grown in our conditions**; domestic species are preferred to tropical tree species.

Domestic or tropical?

Wide selection in the shops bears witness of the benefits of the **use of tropical wood** – furniture is not expensive and does not require any finishing, it looks good...

Species composition?

A higher share of "eco-stabilizing" tree species is outplanted – in our conditions mainly **broadleaved tree species and fir.**

Species composition?

A big issue chiefly in our conditions is the predominance of **spruce or pine tree monocultures**. Such forests grow fast but they have lower stability and resistance towards natural disasters of all kinds.

Clear cuttings?

During timber felling it is **inadmissible to create "clear cuttings"** with the exception of disasters and only to a minimum extent.

Clear cuttings?

Logging has the form of clear felling which leads to the creation of **large clearcuts** subject to intense soil erosion and lack of shade. Also other factors come into play that reduce the stand regeneration capacity.

FSC

Natural nutrients?

During felling, logging residues are left behind to decompose, balance and accelerate **natural regeneration of nutrients** in the soil, slash burning is not practised.

Natural nutrients?

Removal of almost all wood matter from the extracted plot. Burning of the logging residues leads to the depletion of nutrients from the sites.

FSC

Breeding place?

Trees with hollows are left standing to protect the species that nest in them.

Breeding place?

During felling, **all trees are removed** from the site depriving numerous species of animals of refuge or space for nesting.

FSC

Conservation or devastation?

It helps protect the existing threatened and devastated world forests and inhabitants who are directly dependent on them.

Conservation or devastation?

Huge demand chiefly for tropical wood significantly **contributes to an increase in devastation of the world's forests**.

FSC

Water sources?

Due to the **protection of water sources** (specifically a reduction of water runoff from the landscape) logging in the close vicinity of watercourses, wetlands and spring areas is forbidden.

Water sources

Logging along water sources is limited only by the use of technology; **areal drainage is common.**

FSC

No-intervention areas?

It is necessary to earmark "**reference plots**" within the scope of a Forest Management Plan which maintain natural processes **entirely intact from human interference** although they are not directly protected by the state.

No-intervention areas?

With the exception of most strictly state-protected plots, such as reserves (and this protection in the poorest countries of the world is rather symbolical), logging **operations are conducted everywhere**.

Chemicals?

Neither fertilizers nor dangerous chemicals are used for pest control, no areal liming takes place.

Chemicals?

In an effort to maximize timber yield, **fertilizers, pest control chemicals and liming are used in the forests.**

Location importance?

In locations of special **environmental, cultural or spiritual** value for the local community, the management practices are especially sensitive or no management takes place whatsoever.

Location importance?

Environmentally (wetlands, spring areas, breeding places) and culturally (sacred groves, pools and other cult spots of indigenous peoples) significant locations fall victim to felling.

Social impacts?

Forest owner works towards a **long-term benefit of a community**: preferentially employs local workers conduct continuous **monitoring of the environmental and social impacts** of forest management.

Social impacts?

It is not exceptional that a logging company forces the local inhabitants and small owners to sell off their forest plots without providing them with any other form of employment at the specific location. **It does not need to take into account any environmental or social impacts of its actions.**

Long-term sustainability

In the long run, the extracted amount of timber **cannot exceed the natural increment** or prevent the possibility of regeneration of the extracted plots.

Long-term sustainability

Intense logging leads to a **constant decrease in the size of forest stands** on a planetary scale.

Plantations?

Plantations, especially in the tropical regions, should lead to a **release of pressure on the use of natural forests**. They must be managed as considerately as possible and they **must not be established on recently cleared plots** (i.e. felled after 1994).

Plantations?

Management on plantations leads to increased erosion, heightened occurrence of pests and necessity to apply various pesticides. Numerous plantations are established on recently cleared plots.

Real price?

Real price?
The real price of wooden products is **much higher than the one stated on the price tag** – the damage compensation to the indigenous population is most likely not included and the damages inflicted by inconsiderate forest management are not calculated as well.

FSC

Real price?

The price of wooden products **corresponds to the actual costs**. The local inhabitants or owners were paid a decent price for the extracted timber and cheaper but less environment-friendly logging methods were not used.

Black Peter

:-(

Activity 5c

INSTRUCTIONS for the EXTRACTION group

First read all of the instructions to know what to expect.

Read the article and then join forces to draw a poster that captures all of the connections mentioned in the article.

Steps:

1. *Everyone carefully reads the article. Mark the information on the margins as follows:*
   + *new information,*
   – *information that contradicts your idea or hitherto knowledge,*
   ? information about which you want to know more or which you do not understand.
2. *After having read everything, discuss the information marked with a minus sign or a question mark inside the group.*
3. *Select the characters discussed in the article and together agree on their relationships. You can mark the connections on a scratch paper.*
4. *Draw a poster that captures all relations, causes, results and consequences described in the article. Try mentioning everything.*
5. *You may not use any letters on the poster with the exception of personal names.*

Where does aluminium come from?

2013

Xipáia, Juruna, Kayapó, Arara, Curuáia, Asurini, Xikrim, Krikati, Apinajé – these are all names of Indian tribes from four Brazilian states whose existence is threatened by the construction of large hydraulic structures. The indigenous peoples have come together in the effort to block the construction of a system of dams on the Amazon River tributaries like Tapajós, Xingú and Madeira. They protest against the construction of the Belo Monte reservoir and hydroelectric power station in the state of Pará that would flood over 400 sq. km of rainforest and deprive nine Indian tribes of their traditional way of life.

One of the main reasons for constructing power stations is securing water for irrigation (but the use of such services can be financed only by large corporations which can invest in the necessary technologies). Another reason is an effort to secure sufficient amount of electrical power for industry. In the Amazon, which is rich in mineral resources, it is mainly the mining industry and also the enormously growing soy plantations.

Between other subjects, the Belo Monte project has been pushed by Alcoa, global giant in the production of aluminium. This is because the environs of Belo Monte are rich on bauxite. Aluminium is the second most used metal after steel. It is valued for its low weight and resistance to corrosion. Its global consumption is steadily rising. It is used in the car-making industry, in ship-building, aeronautics or in building industry. The manufacture of one passenger car consumes around 130 kg of aluminium equivalent to additional 6,500 kg of waste rock. The chemical reactions occurring during the production of aluminium from bauxite cause a release of toxic substances, such as fluorine, into the atmosphere harmful to the environment.

Moreover, the production of aluminium is highly energy-intensive: already in the early 1990s, the aluminium works had higher power consumption than all of the African countries combined. The deposits of bauxite are often located in equatorial regions. Brazil, where the extraction is associated with large destruction of tropical rainforests, is among the key suppliers of aluminium.

A report of the World Commission on Dams from 2000 states that large constructions of power-generating nature do not pay off in the long run and that combinations of smaller alternative sources of energy are more suitable. The local populations usually have very little benefit from such large projects. This is confirmed also by the Belo Monte power plant. Out of the total output of 11,000 MW only 1,000 MW are planned to cover the needs of the state.

The way of life of the local inhabitants, in the Amazon chiefly of the Indian tribes, is culturally and practically bound with the given territory in which they have lived for centuries. For example, the Indians from the Enawené tribe depend on fishing and do not consume any other meat. If a dam blocks the watercourse, the freshwater fish disappear. This entirely transforms the food chains. A large body of water affects the local climate. The dam inundates a territory where thousands of animals have lived and where sacred sights of the tribe have been located.

Our aluminium package can have its origins in the rainforest subsoil. Europe is strongly dependent on the import of aluminium due to its small deposits. The Czech Republic however recycles only 13 % of its consumption. Yet aluminium has unique the recycling characteristics because its quality does not deteriorate. If compared to production from primary sources, recycling of aluminium waste saves roughly 97 % of energy. The recycling of one ton of aluminium forestalls the release of roughly 9 tons of CO_2.

The principal cause for the dysfunctional system of recycling in the Czech Republic are poor recycling services: a complex system of aluminium waste collection has not yet been implemented. Awareness-raising campaigns for the public are also missing and the interest from the side of processing works is also rather small. Despite all this, there are several firms engaged in the collection and recycling of aluminium waste. Specialized firms EkoMetal Recycling Rýmařov and Alutherm CZ Mníšek pod Brdy process sort aluminium. Sometime aluminium can be sold at local scrapyards.

Sources:

Czech ecological footprint. Environmental and social impacts of consumption beyond our borders. Brno – Praha 2005. [online]

Dams and Development. Final report of the World Commission on Dams, 2000. [online]

Instituto Socioambiental - www.socioambiental.org/e/; Survival International www.survival-international.org

... consumer responsibility alias how to improve our battered relationship with rainforest

More environmentally-friendly garden party – grilled meat can be organic or from a small breeding farm, beer can be in bottles, crisps not fried in palm oil, garden furniture can be from **FSC-certified wood**, and the crops that we cannot replace from domestic sources (coffee, cocoa, bananas) can be **Fair Trade**.

If we do not wish to consume Amazon soy in the form of meat, we can either generally limit our meat consumption or select such meat guaranteed to have come from animals which were fed from domestic sources (meat from known breeders or certified **organic meat**).

Also aluminium can be frequently completely left out or its consumption effectively reduced by consistent **recycling**. It concurrently represents essential saving of energy necessary for the production from primary raw materials.

High stability **palm oil** is maybe healthier for consumers but decisively not for the ecosystems and inhabitants of Southeast Asia. (By the way, the healthiest crisps are those that we do not buy.)

FSC forest certification – offers consumers a guarantee that their money does not support illegal felling and unsustainable forest management. The core idea is support to environmentally sane, socially beneficial and economically viable forest management all around the globe, protection of biodiversity, maintenance of the ecological function of forests, etc. If we therefore purchase anything manufactured from tropical wood, it is recommended to prefer a product carrying the FSC logo.

For more details go to **www.czechfsc.cz**.

Fair Trade – an alternative to unfair conditions of international trade. Fair Trade rules for example ban the use of child labour or environment-unfriendly production methods, chiefly rainforest felling. This can be achieved thanks to higher prices paid to farmers allowing more decent livelihoods that are not obtained by further expansion of the plantations.

More on **www.fairtrade.cz**.

How can you tell Fair Trade?

The system of labelling Fair Trade products works in two ways. One of them is the FAIRTRADE logo granted by the FLO (Fairtrade Labelling Organizations International). Another way to guarantee "fairness" of the goods is a membership in the WFTO (World Fair Trade Organization).

Created by NaZemi in 2012 i the framework of "The Taste of Rainforest" workshop from "The World in the Shopping Cart" series. For more information go to www.nazemi.cz
Supported by the Ministry of Youth, Sports and Education and the Ministry of Foreign Affairs.

The Taste of Rainforest

Who likes it? Us? We have heard so much about the significance of primeval forests, especially rainforests, for the entire planet and that we must protect them. The disappearance of rainforests is one of the most pressing global issues. Their further destruction eventually leads to an enormous global problem. Is it normal to be savouring a rainforest? Or would they? **In the world of globalized economy, we often cannot stop wondering what our appetite can cause.**

Did you know that...

- Tropical rainforest is the species-richest type of forest. One hectare of rainforest can include 40–90 tree species and one tree may provide shelter for over 40 species of ants.
- Rainforest soils are very poor because nutrients are bound in the fast-growing living matter.
- The largest rainforests are in Brazil, Democratic Republic of the Congo and Indonesia.

Rainforest as a home:

Numerous cultures still exist that are directly bound to a rainforest – it is their home. The prime nations – the **Pygmies** (Africa), **Penans** (Borneo), **Tsimane** (South America) and others – use forests without preventing their natural regeneration. They conceive of the Earth as their Mother that cannot be owned or even sold.

Rainforest as a climate regulator:

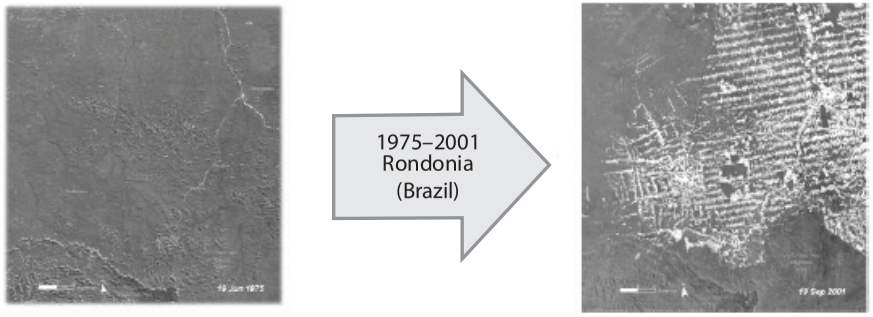
Each forest is of key significance for the stabilization of water regime and climatic conditions in a specific region. With **tropical rainforest, the specific region is the entire planet**.

- Although rainforest does not directly supply Earth with oxygen, it stabilizes the climate by binding huge quantities of CO_2.
- Since the destruction of rainforests causes release of CO_2, it simultaneously compounds the greenhouse effect.
- The "small water cycle" above rainforests binds large amounts of water vapour. Deforestation in these regions is most likely associated with a more frequent occurrence of extreme flooding in the distant regions, including Europe.

Vanishing rainforests

In the early 1900s, the total size of primary forests amounted to roughly 16 million sq. km. Today, it is less than a half (i.e. roughly 7 million sq. km).

- The present pace of deforestation is around 12–15 million hectares per year.
- Every two seconds, the world forests shrink by the size of one football pitch.
- If the deforestation continues unabated, the rainforests outside the nature preserves would vanish by the half of the 21st century.



Rainforest as goods on the shelves of our shop

Imagine that you are invited to "just an ordinary garden party". You will be grilling, drinking coffee, beer in tins, somebody will bring chocolate covered bananas, somebody else a bag of crisps fried on prime quality oil...

Coffee, chocolate, bananas – the problem with many delicacies grown in the regions of tropical rainforests rests in, apart from other things, inadequate purchase prices. When the free market pushes down the prices too low, primarily poor farmers in developing countries become affected. The inability earn a living results in the misuse of child labour, departure to the suburban slums, transition to the cultivation of drugs or effort to secure higher income by extending the plantations at the expense of rainforest.

Aluminium – Europe does not dispose of large deposits of bauxite despite its large demand for aluminium. This is solved by extensive imports. The tragic irony is that the second and third largest exporters of aluminium are Brazil and Jamaica, states covered by rainforests.

Soy – soy plantations pose the most serious threat to the Amazon rainforests. Absolute majority of soy goes for export to Europe. The target consumers are not vegetarians, however, 90 % is used as fodder for cattle which end up on our grills and plates.

Palm oil – if you carefully look at a bag of crisps, cheap chocolates or instant noodles, you will discover that they tend to contain palm oil which producers cannot praise enough for its qualities (e.g. heat stability) and low price. Oil palm plantations are the most serious threat to the rainforest in Southeast Asia. The import of palm oil into the CR is on the rise. It is also used in cosmetics and has use potentials as biofuel.

Garden furniture – import of tropical wood to the Europe keeps increasing. We can most commonly find it in shops selling garden furniture. More than a half of the imported wood comes from illegally felled and exported trees – the poor countries have thus lost not only part of their natural wealth but also profits they are entitled to.

For many people, forest is an apparently hopeful way of working their way out of long-term poverty. This is especially so due to the encouragement by the demand in wealthy countries...

Another country, another situation…	
Countries of the "Global North" (United States of America, Australia, European Union, Canada, Japan and other countries that often have a colonial past) • they belong to economically most powerful countries in the world • they have stabilized demographic parameters • they have great impact on the shaping of rules of international trade • they provide original capital, management, and pocket the majority of profits	**Countries of the "Global South"** (most of the countries in Central and South America, Africa, South and Southeast Asia) • mostly former colonies or dependent territories • frequently they are faced with extreme poverty • unsustainable population increment, high child mortality • necessity to conform to the terms of international trade, the requirements of the World Bank, International Monetary Fund, etc. • they bear the majority of consequences (destruction of the environment, misuse of labour force) and they offer cheap resources

... Another situation, common responsibility

For example, in the Amazon, there is a large organized resistance movement against the destruction of the environment of the native population. This effort initiated directly by the indigenous peoples is supported by a series of non-governmental organizations.

The devastation of rainforests can be prevented by an effective legislative protection, e.g. the establishment of new nature preserves. The problem however remains that commercializing rainforests is still seen by the poor countries as profitable in the short run although occurring at unequal terms of trade. The creation of a special international fund is therefore being considered and the project, even it is still in its beginnings, has been initiated. Rich countries would contribute to this fund and the poor countries could draw from it certain compensation for conserving forests instead of transforming them into goods for the international market. But the plan is still at the proposal stage.

The Taste of Rainforest

Causes and impacts of rainforest felling

A rainforest is when...

Forest as the highest stage of community

If communities of living organisms are left to evolve independently, a gradual but remarkable change occurs: the composition of plant and animal species and conditions of various survival strategies become transformed. A web of mutual food chain relationships is spun and the arrival of every new species can change the environment in a way that opens new space for the occurrence of numerous other species. Shrubs provide shelter for countless species of invertebrates, lichens, bryophytes and micro-organisms. If an entire shrub stand becomes established, it can provide refuge for many larger organisms such as birds, beasts of prey, etc. This process, during which species variety and mutual dependence of organisms generally increase, is referred to as "succession".

During succession, organisms even change their abiotic conditions. E.g. a formed community of wetland vegetation affects the water regime in its environs, the plants and soil micro-flora impacts the chemical and physical properties of the soils and thus also the possibility for other species to take hold.

The peak of succession is a stage of climax when the given community becomes fully adapted to the conditions of the site it occupies. No new species enter the community and the network of interrelations has reached high complexity. Such a state does not in any way imply that evolution has stopped but that it has achieved maximum diversity. Potential fluctuations (e.g. outbreak of one of the species) are balanced by negative feedbacks (e.g. temporary increase in the population of its parasites).[1] If the values of selected key factors (chiefly altitude and relative temperature and humidity) are favourable, forest tends to be the highest stage of succession. A wooded area that has not been affected by human activity is referred to as primeval forest (or ancient, virgin and primary forest).[2] For the issues related with this definition refer to the explanatory box. Forests have evolved on Earth in countless varieties.

Forest is one of the species-richest communities and it is a result of a long, more or less undisturbed evolution. The relations between animals, plants, germs and their abiotic environment are in a dynamic balance

The definition of "primeval forest" is problematic. We can commonly read about "indigenous peoples living in a primeval forest" - yet Indians also undertake diverse activities in a forest environment. Human activity, e.g. by dint of industrial emissions, impacts the entire planet and thus also primeval forests. There are no regions that would be spared the influence of emissions...
"If we use the term primeval forest, we mostly mean "an ancient forest of natural character".[3]

Nowadays, a fully intact forest does not exist. The term "primeval forest" denotes relatively most ancient forest stands with minimum human interference.

In the Czech Republic, as "primeval forest" are usually labeled some old forests, economically not used during centuries, like Boubín, Žofín or Hojná Voda.[5]

The majority of forests of primeval nature are located on the territories of these states:[4]

Country	Primeval forest (ha)
Brazil	415,890,000
Russian federation	255,470,000
Canada	165,424,000

The total size of forests corresponds to roughly 26 % of dry land.

Different country, different forest – variability of primeval forests:[6]

Forest type	Climatic conditions	Characteristics	Specificities
Boreal coniferous forest	Continental climate, large temperature variations between winter and summer, precipitation prevails over evaporation	Tree-layer is relatively poor on species, the shrub and herb layers are not much present, the moss layer is almost continuous, lichens are well developed	Occurs only in the northern hemisphere, slow biomass accretions, massive development of peatbogs
Deciduous forests of the temperate zone	Smaller temperature variations, balanced precipitation throughout the whole year	Predominant tree species are oak and beech, herb layer develops chiefly in spring before trees grow foliage	"Floodplain forest" is a specific type of forest (highly threatened in the CR) protecting the landscape against floods during the spring thawing of snow,
Monsoon forests	Overall precipitation amount is higher than in savannahs, but its distribution throughout the year is unequal	All forest layers are represented, the most developed is the tree-layer, during drought period many trees shed their leaves	The closer to the equator, the more balanced distribution of precipitation throughout the seasonal cycle
Tropical rainforests	High temperatures, small daily and annual temperature variations, sufficient precipitation throughout the whole year	Maximum development of the tree-layer, epiphytic plants, parasites, very thin layer of humus (more details in the text)	The most manifold forest type, biome of global significance (more details in the text)
Mangroves (special type of tropical rainforest)	High temperatures, small daily and yearly temperature variations, sufficient precipitation throughout the whole year	They grow strip-wise in saline coastal habitats on unstable subsoil and do not reach to great heights	Quite unique type of forest, it provides conditions for the origination of special life-forms and adaptations

Soils in rainforest regions are very poor because nutrients are bound in fast-growing living matter.

The stand is considerably height-structured, conditions in the individual layers vary remarkably – chiefly in terms of the quantity of sunlight. The competition for light has led to the evolution of a number of unique life forms (lianas, epiphytes, parasitic plants).

Tropical rainforest

Despite its astounding variety it grows on surprisingly poor soils mostly of ochre or brick-red colour. Its biological cycle of substances and energy flow is very fast and for that reason humus layer tends to be extremely thin. Of all other existing forest types, it is most richly structured as to height.

The tallest tree layer reaches up to 60 m high and the age of trees averages between 200 to 300 years. Compared to our trees, tropical wood accretes evenly throughout the entire year and shows no growth rings. Dense canopies reduce the amount of sunlight received by the shrub and herb layers to only 0.1 to 1 percent

Light generally is subject to fierce competition. Each plant form addresses this issue differently: many plants attempt reaching maximum height, closer to light. The occurrence of lianas and epiphytes – plants growing upon trees and using them for support without harming them – e.g. orchids and numerous fern species – is exceptionally high. Another option is to learn how to live in the absence of sunlight – an evolutionary trend

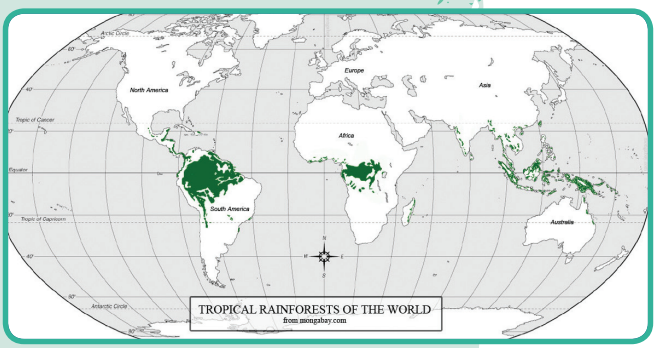
chosen by parasitic, non-green plants. Slow-growing lichens, frequent for example in boreal forests, would not succeed in conditions with such fierce competition for resources.

If we ascend through the rainforest into the mountains, the trees become slightly smaller and lianas give way e.g. to ferns and bamboo. Tropical rainforest in altitudes over 2500 m a.s.l. is referred to as **cloud forest**. In these altitudes, clouds are formed and such forests are marked by permanently decreased visibility.

In the early 20th century, the surface size of rainforests accounted for roughly 16 mil. sq. km, while nowadays it is only around 7 mil. sq. km (which corresponds to 4.7 % of all dry land).

Countries with highest acreage of tropical rainforest[7]

Country
1. Brazil
2. Democratic Republic of the Congo
3. Indonesia
4. Peru
5. Colombia



Primeval forest as a value of its own and as a global stabilizer

The essential significance of tropical rainforest ensues from its aforementioned characteristics.

First of all, a full-grown rainforest is of great contribution for its immediate environs – the tree roots avert erosion (avulsion of the few available nutrients into rivers and reservoirs). At a local level, rainforest also helps significantly regulate the "small water cycle" and form an environment of optimum temperature for numerous species. In logged-over rainforest areas, temperatures increase by up to 15 °C.[8]

Each forest is essential to the stabilization of water regime and climatic conditions in every region.

Rainforest is significant also owing to its size and inaccessibility – many big beasts of prey need for their survival sufficiently large territories (still to be found in rainforests) undisturbed by human activity. Carnivores themselves are essential for the regulation of sustainable populations of many other species of animals.

The widespread idea that rainforests supply the Earth with oxygen is rather mistaken (an existing tropical rainforest has a zero or very slightly positive balance of oxygen production. Although plants produce great quantities of oxygen, it is simultaneously consumed by the breathing of living organisms and the decay of dead organic matter. Rainforest functions as a reservoir of tremendous quantities of carbon dioxide. Carbon atoms are bound in the bodies of plants and animals. For example, the Congo rainforest accounts for 8 % of the global carbon supplies bound in living matter. It has been calculated that the Amazon rainforest captures 1.2 billion tons of carbon dioxide (CO2) every year. Due to the rapid biological cycle of substances in the rainforest ecosystem, CO2 is released into the atmosphere for limited periods of time. If this does not occur, the likely result is a global increase in temperature and a change in the composition of plant species in favour of those that can make better use of higher CO2 concentrations (largely tropical and subtropical species).[9]

Rainforest does not directly supply the Earth with oxygen but by capturing large amounts of CO_2 it contributes to the maintenance of an optimum ratio between these two gases.

The above-mentioned characteristics in fact apply to any healthy forest. Tropical rainforest is however important not only for the maintenance of

local stability since it has a key role in the functioning of entire global ecosystem. Rainforest is the **largest stabilizer of the Earth's environment** – it namely maintains adequate levels of carbon dioxide and impacts macro-climatic phenomena. [10]

The issue regarding the stabilization of macro-climatic conditions is still full of question marks. Recently, some surprising theories have surfaced showing that rainforest (and to a lesser degree all other) plants release great amounts of terpene and isoprenoid molecules into the atmosphere functioning as condensation nuclei for the formation of clouds. If this mechanism stopped working, the temperature could ostensibly increase by up to 10 °C. In the "small water cycle", huge quantities of water keep circulating over the Amazon rainforest (the "small water cycle" occurs over the mainland with precipitation falling over the same territory from which it has evaporated). The Amazon rainforest thus also shares in the maintenance of airstreams, stability of the pressure height and low. [11]

Trees help maintain optimum temperature and air moisture.

"Small water cycle" taking place over rainforest binds great quantities of water.

Several examples of species diversity in rainforests:

- On 1 hectare of rainforest, 40-90 species of trees can be found.
- In the Panama rainforest (77,000 sq. km), as many tree species grow as in the entire Europe (covering a and area of 10,532,000 sq. km).
- American biologist Edward Wilson discovered 43 species of ants on a single tree in a Peruvian rainforest.
- Generally, up to 90 % of all terrestrial animal species live in rainforests. [12]

"Throughout the Ice Ages, more species survived in the rainforests than elsewhere on Earth. This is why tropical rainforests are the largest existing gene pool. They are sometimes referred to as evolutionary laboratories. Some inaccessible stretches of rainforest are truly th last places on Earth where the undisturbed evolution of life forms takes place.14 This is of essential significance for the study of laws and possibilities of evolution and further understanding of the natural relations of life. Many environmentalists however view biodiversity – or the existence of each individual species – as a value of its own." [15]

Last but not least, tropical rainforest is a biome with the **greatest diversity of species on Earth**. [13a]

The diversity does not concern only species. Thanks to high primary production, tropical rainforests are also distinguished by the highest variety of food chains. Nevertheless, due to severe competition, **none of the species occurs in numerically richer populations**. [13b]

Tropical rainforest is concurrently astoundingly rich (in terms of the number of species) yet vulnerable (due to small populations).

People and (their?) forest

Human exploitation of forests

Forest can be conceived of as the peak of natural diversity and tropical rainforest as its most advanced form. Forest provides humans with innumerable values. Relaxation, inspiration, space for meditation, topics for scientific research, spiritual and aesthetic experience – all this is used by people without directly encroaching upon the natural cycle of succession in any way. Forest also supplies us with numerous medicinal substances, materials for sculptures, musical instruments… Even these do not usually bring about any serious interference with the composi-

Human life has always been inseparably tied with forests.

tion of the forest community. Forest also serves as a source of food, firewood, construction material, etc. Collecting fruit, hunting animals, pasture and chiefly felling of trees impact the species composition quite fundamentally; they can even disrupt the ability of self-regulation characteristics of a healthy community. When a swathe of forest gives way to fields for crop farming, the succession becomes definitely interrupted.[16]

People more or less interfere with the development of every forest.

Similarly to the diverse appearances of forests, huge differences exist between the methods and intensity of human exploitation in various parts of the planet. If we simplify and generalize, we can trace principal differences between the trends in the countries of the global North and global South. The majority of so-called developing countries are among states of the global South. (See the following chart for a more accurate division.)

Problems of forest management in Czech conditions:
In the Czech Republic, forests account for nearly 34 % of the territory. Although this value is rather high, their health condition is among the worst in Europe – they are characterized by a decreased ability to retain precipitation and resist natural disturbances, such as the outbreak of pests. This is chiefly due to unsuitable species composition and unsustainable felling methods.
– Spruce that used to account for 11 % of tree species now represents 53 %. Oak and beech conversely occupy only 13 % of the forested territory although if combined, they should account for roughly 60 % of all woody species.
– Of adverse impact on forest stability are clearcuts after principal felling and the hauling of all wood matter from the clearings.[17]

Land cannot be owned

Approach of indigenous populations

All known original communities – Amazonian Indians, Australian aborigines, Native Americans, Inuits from Canada or indigenous nations from the Pacific islands – refer to our planet as Mother Earth. And all of them mean it literally. Plants, animals, all living things as we know them, are fed "from her breast". We germinated inside of her, we are part of her, we were born of her and we will dissolve in her again to allow for new life. Culture and religion of all primitive nations are rooted in nature and, save for some exceptions, their natural life consists in a subsistence economic system. If it is at all possible to refer to a notion of ownership in these nations, communal land holding is prevalent, protecting the land from any abuse. These people believe that rocks, trees and land all have a soul. Every civilization with a similar approach to the Mother Earth limit individuals who would like to own, exploit or sell land. People are considered as a part of living nature. Primitive nations usually take from the natural resources only as much as can become naturally replenished. Their interference with the natural processes is minimal. [18]

Primitive nations view the Earth as their mother that cannot be owned or traded. This leads them to a greater respect toward the use of natural resources.

Forest as a home – significance of the primeval forest for its inhabitants

The importance of primeval forest for its original inhabitants naturally corresponds to what has already been said in the general introduction. Rainforests serve as home to a large number of peoples – Amazonian Indians, indigenous population of Central America, Pygmies from Central Africa, original inhabitants of Indonesia, Penans in Borneo, the Batak in the Philippines, and numerous others. Their dependence on nature they inhabit is not greater than with the "Western civilization", it is merely more obvious, conscious and immediate. Rainforest supplies its inhabitants with every-

Numerous cultures still exist whose bond with the rainforest is quite immediate. This is why they have venerable knowledge of the rainforest organisms and the possibilities of their use.

thing they need for life. The Bolivian tribe of Tsimane, for example, cover half of their foodstuff needs from small fields established on former rainforest plots and half from gathering food directly in the rainforest. Thanks to their traditional skills, the locals can use rainforest as inexhaustible pharmacy and to obtain materials for their clothes, weapons, housing, and ritual objects.[19]

For example the Tsimane cure sore joints with oil from the fat of a boa. One study describes the connection between the extent of use of original knowledge of traditional medical treatments by the tribes and the health condition (and healthy mental development) of their children. It clearly follows out from this just how important the species diversity and its detailed knowledge are. The disappearance of a species may deprive the indigenous people (and not only them) of the possibility to cure a specific disease.[21]

The spiritual life of primitive nations is equally closely bound with the rainforest – they view all of its animal inhabitants, plants, and rocks as their brothers and the Earth as their common mother. Religious concepts that, if strongly reduced, can be referred to as animism, are based on the faith that everything on Earth is alive and has a soul. The awareness of a human closely bonded with nature practically translates into an effort of least possible harm to the Earth.[20] We cannot omit a seemingly trivial fact that rainforest is for the primitive nations a home – body and bones (feeling of safety, familiar and well arranged space to which they are fully adapted; emotional tie to place, patriotism).

Primitive nations use rainforest without compromising its natural regeneration.

However, not even full dependence on rainforest presents a whole-scale interference with its development. This is the first result of a small (decreasing) number of people living only from what rainforest has to offer and second, a result of their modest needs.

Man from the Enawené Nawé tribe.

Considering that the life of the indigenous populations and of all human life in general is so closely interconnected with forests (and nature), the actual relationship of miscellaneous human exploitation of forests can be sustainable in the long run in certain forms or at least it may not lead to any fatal transformations. If the intensity of exploitation goes beyond a certain point (that can be understood as, for example, the ability of a forest to regenerate what people withdraw from it every year), irreversible changes can occur in the entire surrounding landscape subsequently affecting everyone in the area. A well-known example is the transformation of the Mediterranean landscape where primeval forests fell victim to massive ship-building, excessive pasture, etc.

Fat profits from the land

Approach of technological civilization

In the countries of the "rich North", the Earth is perceived as a resource whose value is realized only in its economic utilization.

Although there are numerous exceptions, the majority of northern, nowadays essentially rich countries are distinguished by an economy based on private ownership. Forests, ponds, cows or land can be owned, sold and purchased on a great scale. The largest owners are corporations. Resources are most typically processed into goods designed not for their own needs but mainly for sale and creation of profit. A characteristic feature is considerable overproduction that drives the expansion of markets (by intensive advertising and expansion outside local markets). In the process, still more resources are needed and when the local ones run out,

it is necessary to look elsewhere. The lifestyle of the majority is beyond the critical point of what nature can annually provide and yet restore its original state. The resources are used not on the local territory but, as a result of international economic policies, also far beyond the borders of each producer country. The greates share of the economic prosperity of many European countries is based on the pattern of importing cheap raw materials from their former colonies. **Man is considered the lord of creation and the Earth just his resource.**[22] In many Latin American countries, in equatorial Africa and Southeast Asia, the cheap resource takes the form of the most valuable ecosystem of our planet – tropical rainforest.

The demands of the majority of people exceed the capacity of a country which they inhabit and so they also consume resources of distant poorer countries

Only three countries (Brazil, Indonesia and Democratic Republic of the Congo) account for two thirds of the world's tropical rainforests.[23]

Different country, different situation

Countries of the global North	Countries of the global South
EU countries, USA, Canada…	All of the countries in Central and South America, African countries, most of the Asian countries with the exception states like Israel, Japan, South Korea, Russia
In many cases former **colonial powers**	mostly former **colonies** or dependent territories
Stabilized demographic parameters	unsustainable population increment, high child mortality
Among **economically most powerful countries** in the world	poor countries which often tackle **extreme poverty**
The ability to **give preferential treatment to their producers** through various subsidies	**inability to compete** with cheap subsidised production
A big impact on the terms of international trade	necessity to become subordinated to the terms of international trade and requirements of the WB, IMF, etc.
They provide basic capital, management, marketing, design of products and they pocket most of the profits	they bear the **majority of costs** (destruction of the environment, undignified working conditions), – **they provide cheap resources**

Different authors[24, 25]

Note. The chart sums up several differences between the "northern" and "southern" countries; the differences are often strongly generalized and do not need to apply to all concerned countries in each group. The chart also concerns only those aspects that either directly or indirectly relate to the issue of unsustainable extraction of natural resources in economically poor countries.

Primeval forest as goods

Significance of primeval forest for globalized economy

Tropical rainforest is a gold mine for traders and corporations chiefly from the countries of the North. Virgin forests contain many things that can be processed into goods and sold.

Agriculture – agribusiness

At the very beginning, it needs to be stated that as far as agriculture (and logging) is concerned, by far not all of the damage can be blamed on the corporations. Farming activities of the indigenous Indian and non-Indian populations strongly exacerbate deforestation. Farming used to be sustainable as long as the population did not grow beyond the forest's capacity of regeneration. This phenomenon nonetheless continues to expand. In South America, for example, people grow

When a rainforest is felled or burnt, large swathes of land are freed for subsistence and industrial farming.

maize, manioc, beans, potatoes, bananas, etc. for their own consumption. Farming on such plots is however faced with a lack of humus and nutrients in the soil. The soil becomes exhausted after a short time, the remaining nutrients are eroded by water and wind and the fields must then be moved elsewhere – log over or burn another stretch of rainforest. This practice is often called **migratory farming**.[26]

It takes between 50 and 100 years for the soil to restore its fertility. In order to have the soil regenerate fast enough and the felling of rainforest not exceed a tolerable measure, such a way of securing livelihood is sustainable only on very small plots. The Indians themselves have practised burning the rainforest for many generations, which naturally impacted the species composition, so strictly speaking, primeval forest (i.e. a territory completely free of human encroachments) has remained only in the environs of wetlands or on steep slopes.[27]

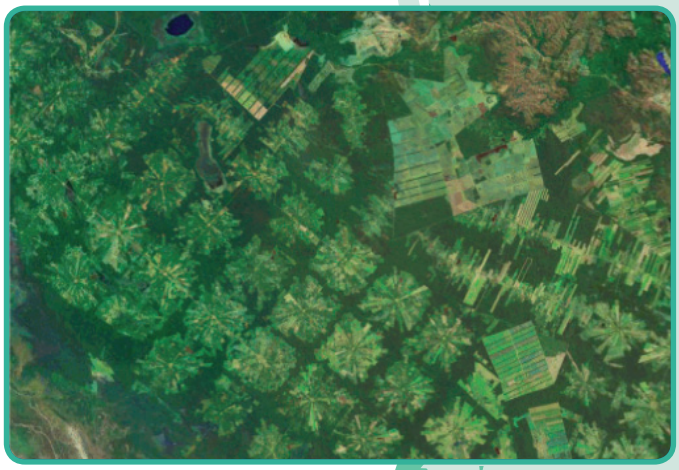
Compared to large companies producing crops for export (see further), local inhabitants are often driven to this behaviour by circumstances of unfortunate decisions made by their governments who are frequently only following instructions of the advisors of international financial institutions.

A dense network of roads servicing smaller plots (state-allocated allotments are positioned perpendicularly or centrally distributed around the roads as shown on the photographs below) interweaves the Amazon rainforest. Basic legal exploitation (farmer is allocated an allotment, burns or fells a stretch of rainforest and plants cultural crops) occurs on these allotments. Soon, however, uncontrolled illegal logging creeps in when the allotment owner expands his land (if spatially

Plan for National Integration (PIN)
It was institutionalised by the Brazilian military government headed by the President Emílio Medici in 1970. It initiated thecolonization of hitherto almost completely untouched region of the Amazon. Supported by the World Bank and the Inter-American Development Bank, a series of development projects were authorized for the construction of highways, cities, dams and rainforest felling to clear land for cattle-breeding. PIN planned the settlement of a 100 km-strip on each side of the constructed highways and was slated to concern 500,000 people. The governmental slogan "land without people for people without land" attracted thousands of poor city-dwellers particularly from the South and Northeast of the country to the Amazon throughout the 1970s and 1980s. It showed however that the cleared land cannot be used for long-term farming purposes and the settlers are now in a hopeless situation. The forests are gone and the soil is infertile. The arrival of newcomers caused tension and often violent conflicts with the original residents. The construction of thousands of kilometres of the Trans-Amazonian Highway and other motorways moreover affected the lives of tens of Indian tribes living on the territory.[28]

The forest destruction is also compounded by the dense road network depriving the rainforest of its original inaccessibility.

Industrial farming is distinguished by the effort at maximize yield and simultaneous decrease in the input of human labour replaced by mechanization and use of artificial fertilizers and pesticides. Preferentially, export crops are cultivated.



Photographs: Bolivia

Photographs: Brazil

possible) up to several times without the awareness (and proper attention) of the authorities.[29]

A large part of rainforests gives way to **industrial farming**: livestock production – cattle breeding for meat, which is mostly exported to Europe and USA – and plantation cultivation of export crops.

First references to soy appear in books older than 2,800 years. Soy beans are very rich on proteins which contain a high share of essential amino acids. Traditional Chinese cuisine uses especially fermented proteins in the form of various sauces. In 1765, soy was imported to the United States that were to become its largest producer for many years to come. In Western cuisine, soy became more widely used together with the growing vegetarian and vegan movement (soy tofu cheese, milk, various substitutes of meat, and soy lecithin – used e.g. as emulsifier).[32]

Soy

The Centre for Applied Research of Biodiversity at the Conservation International states: "In the past three decades, the cultivation of soy has become one of the most serious threats to tropical biodiversity."[30]

Soy, together with our leguminous plants, belongs to the family Fabaceae. The botanical name of the original species is Glycine max (soybean). The plant originally comes from the temperate zone in northern and central China. [31]

The demand for meat increases the demand for soy used as replacement for meat and bone meal in animal fodder. As a result, farm plots keep expanding at the expense of rainforest.

In the USA and Europe, soy is primarily used as fodder in the form of "soy cakes" (remnants of oil pressing from ground seeds) and soy oil.

After the epidemic of mad-cow disease in the 1990s, a ban on meat and bone meal (MBM) was imposed. The ban coupled with a growing world demand for meat led to a massive increase in the cultivation of soy replacing MBM in animal fodder especially due to its convenient content of proteins and low price.[33]

In the last 40 years, soy production increased more than 500 % from 44 million tons in 1970 to 252 million tons in 2011 and it keeps growing: it is estimated that by 2020, the production of soy will have reached 303 million tons.[35]

Nowadays, half of global production of soy comes from Latin American states – Brazil (soy is grown on 30 % of arable land – 21 million hectares), Argentina (19 %) and Paraguay (3 %). In these countries, soy is grown chiefly as an export crop for Europe where it is used as animal fodder – annual consumption of soy is roughly 35 million tons. The provenance of 95 % of fodder used in Europe is in Latin America. Yet, despite the promises of the Western corporations and even though it may sometime seem otherwise, soy cultivation has not made the local people prosper but rather lose their jobs and become oppressed. Industrial farms cultivate large plots of land by machines. This

In some regions, soy farming presents a direct form of suppression of the indigenous inhabitants – the Indian tribes. For example, in the Xingú reserve in Brazil, rainforest has been cleared almost all the way to its borders despite all efforts to forestall the felling. The reserve is a spring area of the Xingú River that flows through the entire park and is a basic source of subsistence for the local Indian communities. The thing the Indians fear most is pollution of the rivers because their main source of food are fish. For a more effective defence against soy farmers, the Indians have founded the Association of the Indian Xingú Reserve (ATIX). The Association also monitors the region, collects data and tries to lead a dialogue with farmers and the state. It also informs the public on the environmental impacts of soy cultivation in the vicinity of the park.[36]

Hand in hand with the increase in demand changed the scale of farms – while soy used to be traditionally grown on family farms of up to 30 hectares, over the past decade the giant farms cultivating plots thousand times larger (according to some sources of up to 50,000 hectares) definitively prevailed.[37] Large tracts of land consume tremendous amounts of fertilizers and pesticides. Among environmental consequences is also higher consumption of water which disrupts the local water cycle – to produce one quintal of soy, between 2,300 and 2,750 litres of water are needed. [38]

In Southeast Asia, most of the primeval forests give way to palm oil plantations. This is because of the growing demand for palm oil.

The reason for growing demand for palm oil are partly its qualities (especially high thermal stability compared to other oils, long shelf life) and low price. The price of oil, as a matter of fact, unfortunately does not comprise the costs of damage inflicted upon nature and people in the regions where this attractive raw material is produced. It is estimated that the demand for palm oil will further increase in future.

Well over one half of trees in a tropical rainforest are felled illegally.

leads to higher unemployment in the specific regions and a decline of subsistence farming. Small farmers are forced to move – either to the cities, where they usually cannot find any jobs and have to live in miserable conditions in the slums at the periphery, or to the yet undisturbed rainforest.[39]

Oil palm

The palm oil is currently the world's most used vegetable oil. In 2010 the global consumption of the palm oil was as much as 46,8 million tonnes. Yet the global consumption of the palm oil is expected to increase a lot as the total world consumption of vegetable oils is said to increase by more than 25% due to demographic developments and improving purchasing power. Currently, in 2009, the EU imports of palm oil from the third countries grew to 5,4 million tonnes. This volume was mainly supplied by Indonesia (56%), Malasya (28%), Papua New Guinea (9%), Colombia (2%) and Ivory Coast (2%). The main EU importers in 2009 were: the Netherlands (36%), Germany (17%), Italy (16%), Spain (11%) and UK (7%).[40]

Consumers are not always aware of the presence of palm oil in their shopping carts and households. Palm oil can be actually found in around 10% of products on European supermarkets shelves from margarine, ice-cream, chocolate, biscuits, cereals, bread, mayonnaise, potato chips to soap, toothpaste and shampoo.[41]

Palm oil is pressed from the fruit of oil palm (Elaeis guineensis) of Arecaceae family.[42] It is originally from equatorial Africa where it has been used for well over 5 thousand years. The tree requires a warm climate with rich precipitation. Recently it has seen a great boom in Southeast Asia. The majority of its world production is supplied by Indonesia and Malaysia[43] but it is also grown in Nigeria, Thailand, Colombia, Brazil and Papua.[44] In order to augment the production, oil palms are grown on monocultural plantations established on plots that were originally rainforest. In total, one half of the new plantations are established at the cost of primeval forests. Statistical record of the Food and Agriculture Organization (FAO) shows that just in Malaysia, the enlargement of plantations has led to the destruction of 700,000 ha of rainforest. Indonesia has allegedly lost (based on governmental data) some 2 million hectares of primeval forest stands.[45] On a plantation, trees form a discontinuous stand. If nothing else grows in between, water and wind erosion begin to effect gradual soil degradation. Farming on plantations naturally also introduces increased application of fertilizers and pesticides in its terrain, including paraquat, banned in many European countries.[46] It is paradoxical that this product, so harmful to the environment, has even been applied as biofuel in some European countries.

The territory of Southeast Asia (including also the islands of Sumatra and Borneo) threatened by the expansion of oil palm plantations, is a home for countless rare and endemic species of plants and animals – orang-utans, Sumatran Rhinoceroses, clouded leopards, Sumatran Tigers, elephants and others.[47]

Wood extraction

Timber trade, mostly illegal, is responsible for 25 % of deforestation of the tropical rainforest. The loggers need especially precious wood but selective felling often does not pay. They therefore often log over entire areas and skid everything they need leaving behind or burning the rest. Even selective felling necessitates construction of access roads that disturb the stand's integrity and ecosystem. The Brazilian government also admits that on its territory, illegal felling occurs in up to 80 % of cases[50]; in Indonesia it is 73 %. Due to illegal extraction, developing countries irretrievably lose their natural wealth and are deprived of revenues to which they are entitled. The World Wildlife Fund (WWF) and Greenpeace report specifies that the profits from illegal logging often fuel local ethnic conflicts – the examples being Liberia or the Congo.[51]

In the Europe, we can most frequently find wood such as teak, mahogany, ebony, jacaranda, cedrorana, cumaru, garapa, gombeira, ituba and others. They originate not only in South America (Brazil, Venezuela, Paraguay, Colombia, and Argentina) but, as regards imports to the EU, mainly in Africa (Guinea, Gabon, the Congo) and Asia. They are used in furniture-making, for veneers, floors and musical instruments.[54] In 2004, Hnutí Duha NGO (Rainbow Movement) asked the suppliers of outdoor furniture (that is commonly made of tropical wood) whether they are able to guarantee that their goods are not produced from illegally felled timber. Out of twenty firms that were contacted, only two could guarantee their legal origin. [55]

The World Bank evaluates the annual lost revenues of developing countries at EUR 10-15 million which, paradoxically, corresponds to the amount that the EU grants in development aid every year. [49]

Among the chief exporters into the EU countries are Guinea, Gabon and the Congo. [52]

According to the World Wildlife Fund (WWF) 50 % of EU imports of tropical wood originate in illegal felling operations. [53]

Mineral misfortune

Another (mis)fortune of numerous developing countries with rainforests is that what lies hidden deep below the roots of trees – huge mineral wealth. The deposits of bauxite, for example, raw material used for the production of aluminium, usually form in tropical regions. The largest bauxite deposits are in Australia, followed by Brazil, Jamaica, West-African Guinea, and many other poor countries. Mining goes routinely hand in hand with the destruction of large swathes of rainforests.[57] The Juriti Velho mine, for example, which is slated to open by Alcoa (the world's largest aluminium manufacturer) in Brazil will necessitate destruction of 8,000 ha of rainforest and the displacement of 1,800 families.[58] Opencast mining methods are old-fashioned, environmentally unfriendly and provoke a multitude of environmen-

The curse of natural resources

Although the World Bank often presents the mining industry as a key to development for poor countries, paradoxically, the more dependent a country becomes on it, the slower and more arduous its development. The contribution of the mining industry toward local economy is small – mining constitutes an unimportant source of temporary employment and after the mining ends (usually after 10 to 15 years), the country is left with destroyed environment and disrupted communities. Higher value is added in the course of further processing that however mostly occurs outside the country where the mining has taken place. The mining industry in poor countries spurs corruption and inequality and fuels civil wars.

The manufacture of one car requires 130 kg of aluminium. [56]

Bauxite is mined in environment-unfriendly opencast mines. The manufacture of 1 ton of aluminium requires 4 tons of bauxite the extraction of which leaves 50 tons of waste rock. And to manufacture 1 kg of aluminium, 15 kWh of electricity (six days of continuous lighting by a common light bulb) are consumed. [60]

Opencast mining of bauxite and other mineral resources severely exacerbates the destruction of rainforest. The manufacture of aluminium is very risky and energy-intensive.

tal problems (e.g. pollution of rivers and soils by mercury, production of highly toxic "red mud" that needs to be prevented from leaking into the surrounding environment).[59]

If we consider the cheap labour and insufficient environmental and social regulations (namely infringement upon the basic human rights, child labour, irresponsible disposal of toxic wastes, etc.), rainforest regions are truly an attractive business for many companies. The most plentiful mineral wealth in South America can be found in the Brazilian region of Carajás; apart from bauxite, it also abounds with deposits of iron ore, gold, nickel, copper or manganese.[62]

Dams allow the building of hydroelectric power plants (energy for farming and mining industries), provide water for irrigation (helping develop cultivation of soy, among other crops), enable regulation of the watercourse's navigability and thus facilitate transport of goods (soy, timber, aluminium).

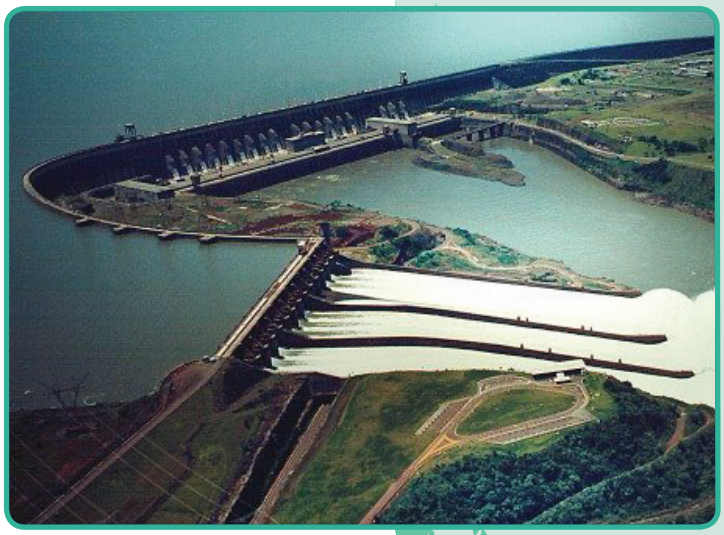
Better, more, easier – alias dams in the name of progress

All aforesaid activities – wood extraction, production of soy beans, mineral extraction and processing – can proceed still more intensely and bring in more profits if **sufficient energy** is secured and **transport** of products from the rainforest to transfer areas, ports or airports **is facilitated**. Dams built on large rivers have promised to meet both of these requirements. Dams have been moreover long deemed as an absolute prerequisite for "development", at least in the conception of the World Bank. Throughout the 20th century, dams have become symbols of progress and human ability to tame nature.[63]

The power plant on the Tucuruí dam, the first gigantic dam on the rainforest territory, whose construction displaced 40,000 people, has not yet brought a single watt of energy to the families living right next to it over the past twenty years. Its capacity of 4,200 MW is predominantly used (2/3 according to the estimates) in a factory manufacturing aluminium for expo.[64]

Inhabitants who used to live basically from subsistence farming in the fertile fluvial plain of the river, were suddenly drawn into monetary economy – they have been forced to buy their food without being able to earn the necessary means.[66]

In a similar fashion to the Gabčíkovo Dam in Slovakia or the Chinese dams, South American countries also build colossal hydraulic structures that cover the energy needs of cities and industry (processing of ores, diamonds, and bauxite), create drinking and irrigation water reserves, and impact discharge (and thus navigability and suitability for water transport) or combine all of these functions.



Dams have positive as well as negative impacts. It needs be mentioned, however, that those who bear all possible risks do not benefit from them. Electricity produced by a hydroelectric plant usually does not find its way to the local population since its purpose is to electrify cities or industry (e.g. manufacture of aluminium) – nothing that can be of great benefit for them. And so the desired development does not arrive.[65]

In 1998, due to growing opposition to dams, the **World Commission on Dams** was founded representing all of the concerned parties. Its task was

to compare the presumed contributions toward the local development of the existing dams with their actual fulfilment, evaluate alternative water and energy sources, and develop internationally accepted standards for further construction or demolition of dams. After it had finished a two-year long survey, the Commission aided by the WB, which had always been in favour of dams, and the World Conservation Union together issued a detailed study titled Dams and Development. Its conclusions were as follows:

Summary of the assumed contributions of dams and evaluation of their accuracy:

What the dams were supposed to achieve	Actual contributions
Flood protection	Works only in some cases – dams are able to retain smaller floods but cannot cope with bigger ones. In some regions, dams have disrupted the system of regular flooding on which the small farmers depended because they were bringing fertile mud and moisture. Moreover, dams themselves can cause floods if the dike becomes ruptured, which was actually the case e.g. in Nigeria, India or Mexico.
Electricity	Over one half of dams do not operate with such output that was anticipated during construction.
Water reserve	70 % of dams do not meet their obligation and only one quarter of them are able to supply one half of the planned amount of water.
Irrigation	Although dam advocates assert that one third of global food production is owing to dams, the World Commission on Dams discovered that it is only 12–16 %. The majority of dams constructed for this purpose operate at less than 75 % of their capacity. Problems with salinization and waterlogging also tend to emerge.
Economic long-term return	Construction of the majority of dams costs 50 % more money than originally planned and the completion of one half of the structures was delayed by over a year. Dam construction is very expensive, the quantities of materials are immense (e.g. the Itaipú Reservoir construction consumed as much iron and steel as 380 Eiffel towers), and we still need to add the labour expenses and costs of building the necessary infrastructure. Only a couple of dams operate at such efficiency that would cover the actual construction costs, yet their lifespan without further reconstruction covers only around fifty years. In the light of these circumstances some alternatives for power generation appear more favourable but they are usually not taken into account by the decision-making process.

Dam constructions drive thousand of people from their homes.

Other negative impacts

Worldwide, 40–60 million people were displaced by dam constructions. They become "industrial refugees" in their own countries. Most affected are indigenous inhabitants whose bond with the environment is very close. In some cases, the displacement is accompanied by violence and murders. Finding a new home for the expelled is then very tough. The refugees are usually faced

The hydraulic power plant Balbina was to replace expensive energy from the existing thermal plants supplying power to the Amazon city of Manaus. Immediately in 1988, when the power plant was supposed to start operating, it showed that the experts who had been warning of project errors were actually right. It was confirmed that the construction of a hydraulic plant in the middle of the Amazon rainforest was not a good idea. The project was termed an economic disaster because the Uatuma river does not have the expected discharge and the generated power costs even more than in thermal plants (it produces only 250 MW with the size of 2,360 sq. km). The tragedy has environmental dimensions as well, however, since as a result of the selection of an unfit construction site (landscape topography of the dam is nearly flat) a much larger surface must have been inundated which caused the destruction of many more thousands of hectares of rainforest than necessary. Since the water submerged forested areas, the decaying plants below the water surface produce ten times more methane and C02 than a thermal power plant of the same output (3,380,000 tons a year). The social implications of the construction involve customary Indian territories and hunting grounds inundated by part of the enormous surface of the dam. Moreover, due to the decaying plants, which pollute and acidify the water, the fish disappeared even downstream from the dam. The original rainforest population thus had to move elsewhere.[67]

Obstruction of the watercourse leads to the dieback of fish and a release of greenhouse gases and the dike threatens to break at any time. The adjustment of navigability leads to the drying of side riverbeds.

During the construction of the Itaipú hydroelectric plant on the Paraná River, 13,500 hectares of rainforest were submerged. The height of the dike is 196 m and the output is around 14,000 MW. The dam supplies Brazil and Paraguay with 25 % and 90 % of their energy needs, respectively. The building of the dam caused the displacement of 70,000 people.[69]

with unemployment, poor sanitary and living conditions in the cities or they are sometime resettled to infertile or forested areas.

Dams are risky also for people living along the rivers and in their surroundings since dams frequently cause the drying of the side riverbeds. This inflicts damage to the local population dependent on farming and disturbs local ecosystems along with the existing infrastructure and climatic conditions. Changes in temperatures and discharge and the barrier constituted by the dike cause the **dieback of fish** and therefore often starvation of the local people dependent on fishing.

Some scientists claim that dams also participate in carbon dioxide and methane **emissions** into the atmosphere (originating from decomposition of organic matter in water and its turbulent passage through the turbines).[68]

The 2000 report of the World Commission on Dams further specifies that from a long-term perspective, large structures of power-generating nature (i.e. also gigantic hydroelectric plants) even do not pay off. The decisions on dam construction are taken by individual politicians or government parties with contacts on national or international representatives of the industry based on the actual wherewithal available and the expected benefits of the structure for the country.

Apart from the aforementioned aid to farming and industrial production, dams and hydroelectric plants are presented as a source of energy for large regions without electrification. When a region wants to break the cycle of poverty and "backwardness", it is ostensibly dependent on sufficient supply with electrical power. The local population however often imagine welfare and development in rather different terms than an official of the World Bank. In his article, P. Bunyard claims in agreement with many local activists about the planned Tehri reservoir in India that a much more sustainable solution to the problem of backwardness and poverty is when the locals are guaranteed the possibility of staying on their land and that their environment will not suffer further devastation in favour of unknown people. Instead of investing massive sums of money and displacing thousands of people, he advises to rely on the natural knowledge of people who know their land best. It is much better to address irrigation and power supply issues in a decentralized manner.[71] This occurs only when it is already too late in many places. Nowadays, there are roughly 45,000 large dams globally which produce 19 % of the world's energy and affect 60 % of the rivers.[72]

Dams are often subjects of international treaties – an entity that provides funds for the construction (banks, corporations, state) asks for example for cheap supply with extracted raw materials as a reciprocal service. One of the largest investors in new dam constructions was the World Bank – between 1980 and 1984, its annual allocations to these structures totalled USD 4.5 billion.[70] It is not surprising that such environment is then favourable to corruption and that intimidation of competitors and opponents has been observed.

Dams do not deliver on their promised utility for the local population (electrification) but substantially disrupt the local landscape.

The case of Mato Grosso – soy, rainforest, dams

The landscape in Mato Grosso (one of the states of Brazilian Federation) is directly threatened by all of the activities that have been mentioned.

The Amazon river basin accounts for one fifth of all exploitable freshwater worldwide and many entrepreneurs see it as an attractive energy source. In Brazil, 93 % of produced energy originates in hydroelectric plants. As of today, Brazil has roughly 2,000 of them with their construction having displaced a total of 1 million people (70 % of them have never received any compensation). In the 1980s, Plan 2010 was born intending to exploit practically all water resources in the Amazon river basin.[73] Plan 2010 anticipated construction of other 494 dams apart from the existing ones, which would cause the displacement of further 800,000 people.

It seemed that the plan was successfully reduced, but it has always come back to life with new modifications.

The Brazilian state of Mato Grosso is a large producer of soy. Half of its production is purchased by Europe. The second largest affluent of the Amazon River, Madeira, and also the rivers Tapajós (Juruana) and Xingú flow through its territory.

In the beggining of 90-ies, the construction plan for five dams in the Xingú river basin was successfully stopped by the indigenous people who were fighting for the survival of their customary way of life. In 2007, the plan was mentioned again in connection with the newly planned eleven dams on the Tapajós River, which should generate power for soy farms and mining industry. Apart from all adverse consequences associated therewith, other six remote tribes in the Enawené Nawé region would be doomed by the dam constructions. The tribes are fishermen but the reproduction cycle of the fish was destroyed and so were the tribes in Enawené Nawé who have been protesting against the destruction of their territories for quite some time: specifically against rainforest felling and pollution of rivers by pesticides. On Madeira, the second largest tributary of the South American Amazon River, the complex of four dams – two in Brazil, one in Bolivia and one on the border between these countries – was planned. The project was supported from the funds of the National Bank of Brazil and largely also from the Brazilian Development Bank (BNDS).[74]

Most recently, on November 2012 BNDES announced approval of an unprecedented loam of 11 billion US$ for construction of the controversial Belo Monte Dam on the Xingu River. In sum, this project has been paralyzed on at least six occasions by affected indigenous communities and fishermen, who have protested over the failures of the project developer named Norte Energía and government agencies to comply with the project's mandated environmental and social provisions. Belo Monte was suspended twice in 2012 by federal judges for the lack of prior consultations with affected people, as required by the Brazilian Constitution and international rights agreements. However, by approving the loan, BNDES makes itself the main financier of a project notorious for violations of enviromental legislation and human rights. Among its enviromental impacts, Belo Monte is expected to cause large emissions of greenhouse gases, including methane, a gas that is 25 times stronger than carbon dioxide.[75]

Jan Maarten Dros, an environmental analyst, says: "soy is nowadays a key factor of deforestation – both directly and indirectly. Direct impact consists in the conversion of "cerrado" - unique South American savannah – and rainforests into soy fields. Indirect deforestation occurs because large companies engaged in soy production purchase a lot of land from cattle breeders who then move elsewhere and fell more rainforest."[76]

Summary

Human use of the potential of tropical rainforest:

- gathering of plants, hunting for animals,
- firewood,
- home – housing construction,
- source of medicines,
- agriculture (cultivating subsistence crops for the local population),
- logging (paper, furniture),
- industrial farming (soy, oil palm, coffee, bananas, etc.),
- pasturage,
- extraction of mineral resources,
- power generation – construction of dams, watercourse regulation, construction of hydroelectric plants

What is the scope of devastation?

A stretch of rainforest the size of a football pitch disappears every two seconds.

It is apparent that rainforests are highly threatened due to its attractiveness for industry. Although we do not have access to accurate data concerning the original size of rainforests, it is enough to compare the current state with the beginning of the early 1900s. While one hundred years ago, the approximate acreage of rainforest totalled around 16 million sq. km, the present size is only around 7 million sq. km. Moreover, the speed of deforestation kept gradually increasing throughout the century (due to felling, burning, establishment of opencast mines or valley inundations). According to the Food and Agriculture Organization (FAO), 10.4 million hectares go destroyed every year.[77] This means that a stretch of rainforest the size of a football pitch disappears every two seconds.

Country	Acreage of cleared rainforest (ha)[78]
Brazil	3,466,000
Indonesia	1,447,800
Mexico	395,000
Papua-New Guinea	250,200
Peru	224,600

In 2005, 10.5 million hectares of rainforest were cleared. According to the materials of the UN, the deforestation has decreased over the past 10 years.

Source: FAO.

And what consequences does / can it have?

Over ten million hectares of rainforest disappear every year.

If deforestation continues in the current pace, by 2050, remnants of tropical rainforest will grow only in protected areas. Rainforests would thus not disappear completely, but let us not forget the radical changes that once occurred in the Mediterranean due to unsustainable forest management. In the case of tropical rainforests, the concerned size is not only bigger, but the ecosystem is of planetary significance.

At the current pace of deforestation, the standing rainforests would not survive (apart from protected areas) the year 2050.

Deforestation accounts for up to 20 % of all CO_2 emissions.

The estimates have it that the possible complete extraction of the rainforest in the Democratic Republic of the Congo would cause a release of 34.4 billion tons of CO_2 by 2050 – the equivalent of Great Britain's emissions for the past sixty years.[79] The release of CO_2 that is bound in the biomass of the Amazon rainforest would increase the current CO_2 atmospheric concentration by up to 10 %.[80] Another problem is that a disturbed rainforest becomes more susceptible to fires and the origination of large clearings reduces the amount of precipitation. Even large soy plantations limit the formation of clouds since water runoff exceeds evaporation. In the past years, Brazil has suffered unprecedented droughts.

The more clearings, the fewer clouds are formed – droughts become more frequent.

More frequent occurence of extreme floods also is caused by massive deforestation in the Amazonia.

Thousand of tons of water and water vapour are bound in the "small water cycle" of rainforest areas. If a stretch of rainforest disappears off the face of the earth, the water remains in the atmosphere. A study of present climatic changes has revealed connections between the destruction of the Amazon rainforest and massive floods in England in June of 2007.[81]

The destruction of tropical rainforests threatens numerous plant and animal species many of which have not yet been even scientifically described (it is assumed that only around one tenth of all species has been described so far). It is apparent that we thus deprive ourselves of possible new sources of medicines and new discoveries in the field of genetics and biology.

Felling of rainforests threatens thousands of precious species of plants and animals and potentially also the functioning of the entire global ecosystem.

Complex relations between animal species, especially at a global scale, are still not quite clear. Nobody can still estimate the degree of loss of species variety that can be born by an ecosystem before it completely collapses. Some biologists however compare each threatened species to another missing rivet in a flying airplane. Everyone can simply predict what consequences the loss of too many rivets would have but no one can say with certainty, which rivet will be the critical one.

Indigenous population of the Amazon
It is estimated that at the time of the arrival of Europeans, 1,000 Indian tribes lived in Brazil totalling 2–4 million inhabitants. Today there are 227 tribes speaking 180 different languages. Many of the groups have not yet even been contacted. According to ISA, at least 46 "isolated tribes" - those that do not communicate with any organization – still exist in Brazil.

Despite large media coverage devoted to the frightening shrinkage of rainforests and the disappearance of plants and animals, thousands of indigenous people living in them went largely unreported. Moreover, we can now only hardly evaluate the real loss of these people losing their homes due to forest destruction. The majority of original traditions have their roots in our strong bond with the land. 150 million of indigenous peoples worldwide are threatened by the encroachment of the local and transnacional extracting companies. Corporations frequently employ very rough coercive tactics or "legal" tricks to drive them out of the land they wish to extract. These acts are justified by persuasion about the necessity of economic and technological progress in line with the European and American models obstructed by the prime nations (to their own detriment, naturally). In Brazil, the acknowledgement of the rights of Indians to their land, language, faith and customs became incorporated into the Constitution as late as 1988.[82]

Tribal land ownership stands in the way of corporate interests because it prevents the governments and corporations from free trading with the land and the rights to use it. The introduction of legislation presented as progressive still continues to usher in private land ownership. Individuals with newly acquired land are subsequently subject to pressure forcing them to sell their land. The common decision-making of entire communities was seen as an obstacle.[83]

Destruction of the indigenous populations and their cultures has been a characteristic feature of European "civilizing" activities since late 15th century when the conquerors for the first time crossed the American lands. The life and culture of displaced tribes seem to be destined for small reserves or, worse, for ethnographic institutes. The destruction of rainforest facilitates the incursion of western lifestyles and consumerism. Television, advertising and insensitive tourism depict them as something that is better than everything else which then leads young people to rejecting their own culture.

The introduction of western medicine to some Indian tribes has led to the decline of profound customary knowledge of medicinal herbs. Instead, the tendency to cure every disease by a pill has become more widespread. It follows out from the latest research in a Bolivian tribe of Tsimane that the Indians' knowledge of natural cures is diminishing and the money for western medicines is lacking. This has a direct adverse impact on the health of children.[84]

Summary

Different aspects of the devastation of tropical rainforests:

- loss of biodiversity
- destruction of homes of the indigenous population
- soil erosion
- more frequent occurrence of fires
- release of CO_2 emissions
- loss of climate stability (at local as well as global levels)
- pollution of watercourses by fertilizers and pesticides
- inundations of large swathes of land by reservoirs

In all forcefully displaced inhabitants – in slums or in newly settled areas – a feeling of powerlessness is growing which tends to be associated with frustration, anger and increased occurrence of ethnic conflicts.

The aforesaid numbers and facts fill the people in the countries of global North with fear and have them asking similar questions:

"Why is nothing being done about it?"

(What can "they" do about it)

They – native and local inhabitants

The Amazonian Indians are strongly opposed to the destruction of their environment, particularly as a result of the construction of new dams. This effort of native inhabitants is aided by a series of non-governmental and non-profit organizations.

Let us start with the local populations. The success of all efforts aimed at achieving more sustainable rainforest management greatly depends on the will and endeavours of the people living in the concerned areas and on the traditional forms of addressing the issue (protests, awareness-raising campaigns, conversion to organic farming, etc.). Their activity can be successful only if it gains support of the public.

A distinct phenomenon in Latin America in the past few years has been the resistance against dams. As the 20th century was coming to an end, the Indians inhabiting the Amazon river basin realized what was in store for them and they, together with environmental organizations, began to effectively organize their opposition. In 1989, the Kayapó tribe organized the meeting in the city of Altamira (northern Brazil) attended by 700 Amazonian tribe chiefs in order to work out a common strategy. For some tribes, traditionally fighting against each other, it was the first such meeting. In their effort to block this project, the representatives of Amazonian tribes started visiting the capitals abroad and tried to convince governments, banks and the public about the validity of the following standpoints:

Preservation of the cultures of primitive nations usually means a notable enrichment for cultural diversity.

Indians have the right to live on the territories inherited from their ancestors without external interferences and they are trying to achieve this goal at any cost since no other existence is thinkable for them.

If Indians succeed in maintaining their way of life, it it could be enriching and significant also for the people living in the so called Global North.[85]

Similar struggles of native peoples are aided by non-profit organizations, such as Survival International, Cultural Survival, Amazon Conservation Team, etc.

In 1991, the Movement of people affected by dams was founded which associates all inhabitants who have suffered from dam construction. Thanks to public support and media attention, the project involving five to seven dams on the Xingú River came to a halt. But in 2009 the project was opened again. Apart from the Xingú River, four new hydroelectric plants should be built on the Madeira River and various power plants on the Tapajós River in Mato Grosso (see above).[86]

They – governments and international organizations

The destruction of rainforest can be slowed down by effective legislative protection and reduction of our consumption.

The **foundation of new nature reserves** and protected areas or subsidies to organic or otherwise sustainable farming are among tradi-

tional governmental means aimed at limiting or controlling illegal and environment-unfriendly logging. This includes **curbing corruption** or legislative regulations prohibiting the mergers of mining companies.

With regards to countries importing raw materials, the **imposition of special taxes** on goods originating in environment-unfriendly production can be considered.

The problem is that countries economically benefit from rainforest felling – sale of timber brings in revenues, new land for farming and cultivating more export crops, etc.

The underlying problem rests in the fact that commercializing the rainforest – the sale of extracted timber and use of farmland – is a welcome source of income for the poor countries where the majority of rainforests are located. The solution is to find a system from which developing countries would benefit at the concurrent preservation of rainforest.

From this point of view, preserving rainforest can look like an an economic nonsense, because a country that keeps it loses huge profits. This paradox could be dealt with some transnational fund which would allocate money to states or other rainforest owners with the purpose of preservation of natural heritage.[87a] Preserving a living primary forest could thus become profitable. Relative to the fact that deforestation is among the most significant sources of greenhouse gases (mainly carbon dioxide) and that undisturbed forests absorb them to a great extent, the fund is planned within the scope of the emissions trading scheme. States with rainforests will be able to sell more emission allowances and benefit from preserving or replanting rainforests.[87b]

A most complex and probably also most difficult solution appears to be a complete **reorientation of poor countries' economies** especially in terms of becoming independent on the production of a few export commodities and of becoming oriented on the local rather than global free market. This nevertheless requires understanding and assistance from the wealthy countries. At the same time, voices of the public and non-governmental organizations calling for at least a partial cancellation of the debt of developing countries to the World Bank are getting louder. The exorbitant indebtedness is one of the factors driving the developing world into commercializing even very valuable resources, such as tropical rainforest.

Even the European Commission attempted to implement regulations on the import of illegally felled timber. In 2003, it issued an action plan abbreviated as FLEGT (Forest Law Enforcement, Governance and Trade). This plan assumes a system of voluntary bilateral agreements between the EU member states and wood-exporting countries pledging to certify their wood from legal origin. The principal problem of this plan is its voluntary nature (no form of recourse is considered for illegally extracted wood) and also the fact that on many territories it is not yet possible to ensure efficient means of control of potential misuse of the certification of legal origin. FLEGT has therefore set out in a good direction but it still has a long way to go to become efficient.[88]

FLEGT is a programme of the EU aiming to stop the import of illegally logged timber. It asks from the exporting countries to issue certificates of legal origin, a requirement that is still impossible to ensure. The programme also does not include any recourse for the import of illegally felled timber.

What can "we" do about it?

"Consumer trends appear to be more effective than states when it comes to protection against destruction and illegal felling of rainforests." [89]

The rainforest regions are way too far from Europe for its inhabitants to be able to fully realize that the purchased furniture from tropical wood may not have originated in legal felling and that the production of soy, coffee, cocoa, bananas and other imported foodstuffs has tremendous impacts on the local population and environment. Yet when consumers dispose of good information, they can be aware of the transformation

The local inhabitants suffer not only from poverty but also from high consumption of the relatively wealthy countries in the global North – too many goods on our shelves are often associated with the destruction of rainforest even without our knowledge.

of tropical rainforest into goods they can or do not need to buy. The following consumer initiatives are based on the conviction that by purchasing goods we also buy their entire past – their impacts on people and ecosystems. If our chair was made of illegally felled wood, it is as if we approved of illegal timber extraction that further cuts the already small revenues of the developing countries. Therefore one possibility of helping limit the devastation of rainforests (which however applies also to the other seemingly unsolvable problems of poor countries) is to be interested in where our money goes.

There are several alternatives of dealing with this situation, for example a full **boycott of uncertified tropical wood** or purposeful reduction of use of products originating in the rainforest regions. With such an approach we are nonetheless faced with the problem of traceability and enforceability of information on the products at hand.

Among the strictest and often also easiest ways of ascertaining the origin of the purchased product are **FSC** and **Fairtrade** certifications.

FSC

An alternative to wood from illegal sources is **FSC-certified** (Forest Stewardship Council) wood. FSC is an independent non-governmental and non-profit organization founded in Toronto in 1993 by the representatives of environmental organizations, wood retailers and wholesalers, foresters, wood-working industry, associations of indigenous peoples, trade unions and certification organizations from all over the world. [90]

The underlying idea of FSC is support to **environmentally** responsible, **socially** beneficial and **economically** viable forest management of the whole world and help to conserve of the disappearing, threatened and devastated world forests. Among the principles of FSC are mainly observing of the specific legislations in each country, respect toward the rights of native inhabitants, assurance of long-term social and economic welfare of the workers and communities in which they live, expediency of forest exploitation, protection of biological diversity, maintenance of the ecological function and integrity of forests, and exclusion of logging operations in areas of exceptional conservation value. Its special measures also regulate management of wood plantations that should complement management in natural forests. A decrease in the pressure on the exploitation of natural forests should boost their regeneration and conservation.

The activity of FSC is funded by charitable organizations and from donations and member and accreditation fees. In order to preserve its independence, FSC does not accept money from industrial enterprises.

Forest owner with an FSC-certified forest (i.e. managed in line with the **FSC standards** which vary in every country and whose observation is controlled by **inspectors**) is entitled to use an FSC logo for his wood distinguishing it from the **wood of unclear origin** in the market (adapted from information materials of FSC CR).

FSC offers consumers the guarantee that their money does not support illegal felling and environment-unfriendly forest management.

Products with the FSC logo originated in environmentally and socially beneficial conditions.

Assessment of suitability for purchasing wooden products according to the origin of the wood

Wood origin	Assessment	Examples of tree species
Domestic FSC	Great, you have opted for the best possible choice	Oak, beech, spruce, pine, maple...
Domestic	Good choice	
Exotic FSC	Consider replacing such wood by local sources of tree species	Teak, eucalyptus, massaranduba, meranti, okoumé, mahogany, Siberian Larch...
Exotic (of unknown origin)	Be careful, you have not purchased well. Reconsider your choice.	

Source: FSC Czech Republic

The acreage of FSC-certified forests is quickly growing. In June 2009, a total of 114 million hectares of forests were certified in 82 countries. Of this number, three quarters are accounted for by Europe. [91]

Let us now look on the recommendations of the Czech branch of FSC for selecting wooden products?

Fair Trade

An alternative to asymmetrical terms of international trade is **Fair Trade** (just or ethical trade) which lays emphasis on **social** (fixed working hours, safety, no child labour...) and **environmental** (growing crops without the use of pesticides) dimensions of production and trade. It is a commercial partnership setting itself the objective of sustainable development for disadvantaged producers from countries of the global South – Africa, Latin America and South and Southeast Asia.[92]

Regarding the conservation of tropical rainforests, the rules of Fair Trade for example expressly state that certified crops must not be grown in place of a logged-over or burnt original stand. Even if the cultivation occurs in its close vicinity, special measures are taken for example to protect sources of water. With Fair Trade, it is possible to buy coffee that has not grown on a plantation but in the shade of rainforest trees, which is a near-natural method. Although yield is smaller, the coffee is of better quality and such use of rainforest land can be considered as more sustainable. Another alternative is to purchase wild coffee growing naturally in the rainforest. The workers in the field or on a plantation earn a decent living and they are not forced to move to a slum, grow drugs or employ their own children.

Fair Trade attempts to achieve this and other objectives particularly by providing **fair terms of trade** for the involved producers and by **informing consumers** on the situation of the producers and their employees in developing countries. The currently available Fair Trade products in the Czech Republic are coffee, cocoa, chocolate, tea, spices, crafts, smaller amounts of dried fruits, clothes, etc. The aforementioned consumer trends are a good means of excluding rainforest from our shopping carts.

FAIRTRADE®

The Fairtrade label guarantees to the consumers that the purchased products were not produced in plots acquired by rainforest felling and that small farmers were paid a decent wage to make a good living which allows them to manage their land in a sustainable way and keep away from felling more trees.

Fair Trade is fairer to:

- farmers (who receive sufficient wages),
- their children (child labour is excluded),
- the environment (exclusion of monocultures, agricultural chemistry, etc.),
- customers (who purchase high-quality, environmentally and socially sustainable products).

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Other recommended web portals related to the topic

Rainforests

Food and Agriculture Organization of the United Nations: www.fao.org/forestry
Rainforest: http://rainforests.mongabay.com/
World Rainforest Movement: http://www.wrm.org.uy/
World Wildlife Fund: http://www.panda.org

Native and local inhabitants

Movement of people affected by dams: http://www.mabnacional.org.br/
Native American Nations: http://www.nativeculturelinks.com/nations.html
Survival International – movement for the support to prime nations: http://www.survival-international.org/
Amazon Indians: www.amazon-indians.org/
Instituto Socioambiental, ISA – defence of social and environmental rights: http://www.socioambiental.org/e/

How can we help

Fair Trade Labelling Organization (FLO): www.fairtrade.net
Society for Fair Trade: http://www.fairtrade.cz
Forest Stewardship Council CR: www.czechfsc.cz
Portal of the Czechia Against Poverty campaign: www.ceskoprotichudobe.cz
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Why talk about rainforest again

If you ask your students, which global issues they consider as the most pressing, at least some of them will surely mention the felling of rainforests. Does it then have any sense devoting more time to this topic in the lessons?

If you stop customers among the shelves of a supermarket and show them a photograph of tropical rainforest and ask whether they would agree with its extraction, their answer would almost always be "never". The relationship of the Czech public to rainforest thus seems to be warm and friendly…

But if you look in the shopping cart of the interviewed customers, you will most likely find a big chunk of meat, something in an aluminium tin, roasted peanuts or crisps… Thousands of hectares of tropical rainforest disappear because soy, used as cattle fodder in Europe, is cultivated in its place. Under the roots of rainforest trees hide massive deposits of minerals necessary not only for the production of tins and yoghurt lids. And the best deep-frying oil is palm oil, after all, whose production causes destruction of the habitats of orang-utans, Sumatran Rhinoceroses, leopards and, last but not least, many poor people in Southeast Asia.

By consuming products originating in burnt-out plots of former rainforests, we give our consent to their destruction, to the displacement of indigenous inhabitants, impoverishing biodiversity, and undermining self-regulatory mechanisms, which maintain favourable conditions for life on the Earth.

We do not need to be drowning in depression from this discovery but it is important to be aware of the interconnections and ask which alternatives there are to fix our bruised relationship to rainforest. Let us therefore ponder over its taste.

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