

Exploring the Earth's surface with the „eyes“ of a satellite...

In the following part you will work with the **program BLIF** (in German: **Blickpunkt Fernerkundung**). With this program you are operating with original satellite images with which you are able to explore the change in the land use in Costa Rica.



Therefore you will analyse a **satellite image from 1986** which you will compare with a **satellite image of 2001**.

1. Open the homepage of BLIF:

www.blif.de and log in

2. Select mode

Select the mode „Profi-Assistent“ and click to „Modus ändern“.

3. View „original“ satellite image

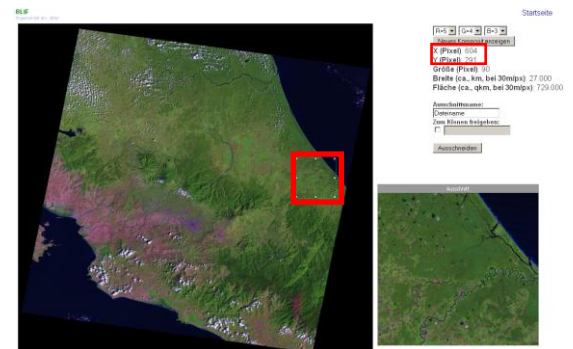
In the menu item „Ausschnitt erstellen und ggf. Landsat-Kacheln hochladen“ cut out the tile „[elp015r053_5t19860206.tar.gz](#)“.

4. Selecting of the investigation area

Select the display detail of the city „Manila“

X/Y (size) in pixels: 614/ 314.

(Frame the investigation area, name it „Manila“ and cut out „ausschneiden“)



Credits: BLIF

Below the assistant „Lewis“ will lead you through the program. Pay attention to his advices.

5. Improve the picture of the satellite image

Go through the three steps „Lewis“ recommends.

(Only for professionals: consider the run of a histogram of one channel before and after the stretch. How does the histogram change because of the stretch? Explain why the image detail suddenly gets **defined**.)

6. Channel combination

Switch between the channel combinations (=Komposit) (R=3 G=2 B=1; R=4 G=3 B=2 und R=5 G=4 B=3).

You will notice the single picture elements (like rain forest, water, settlements,...) colored differently. Register the noticed colors to the chart.

Picture element	R=3 G=2 B=1 (true color image)	R=4 G=3 B=2 (false color image)	R=5 G=4 B=3 (false color image)	natural	man-made
Rain forest	dark green			X	
Plantation					
Uncovered areas					
Water					
Settlements					
Grassland/ willow					

- Find the parts of the image you are not able to define. Which are those? Discuss them with your neighbor.
- Differentiate the picture elements into „**natural elements**“ and „**man-made elements**“. (Discuss with your neighbor and mark your results in the chart)
- Analyse which combination is suited to show/ accentuate:

Rain forest	R=___ G=___ B=___	Plantation	R=___ G=___ B=___
Road	R=___ G=___ B=___	Uncovered areas	R=___ G=___ B=___

Settlement R= __ G= __ B= __

Water R= __ G= __ B= __

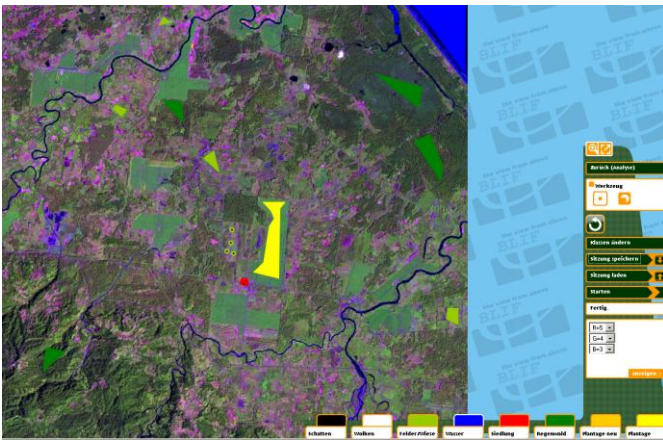
7. Unsupervised classification

Construct a „unüberwachte Klassifikation“. **Modify** the class number (maximal 8 classes) and evaluate the results: Not succeeded is the (blue, green, red, ...) _____ class because _____

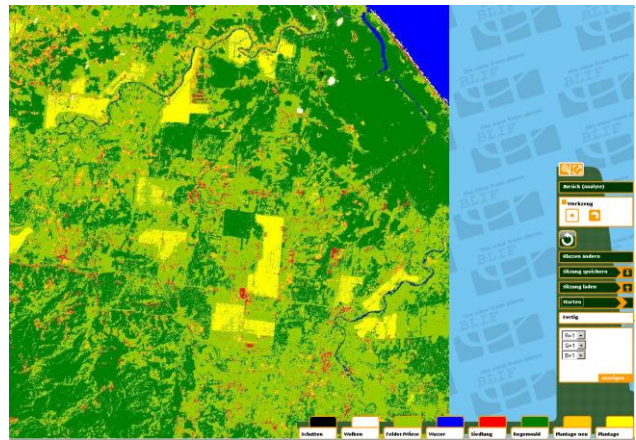
8. Supervised classification

Construct a „überwachte Klassifikation“. At the **Info-Button** you find out how to deal with it. (Remember to save your „**session**“ before you operate the classification with „**start**“. Then you are able to upgrade your classification with „**Sitzung laden**“.)

Advice: Come to an agreement with your neighbor about the classes and the colors of the classes!



Credits: BLIF



Credits: BLIF

Rate your result:

a) Describe where the classification succeeded well.

b) Name the failings and try to explain possible reasons for them.

9. Change of the land use between 1986 and 2001

a) Compare your map of land use (from 1986) with the map of land use of your neighbor who edited the satellite image of der 2001. Discussion: In which classes (f.e. plantation, rain forest, ...) you can see the changes best?

b) Explain the following statement using your result: „*Multinational banana companies increase the banana plantation of the country incessantly and turn the tree of paradise into a tree of hell.*“

M1: Banana cultivation and export development in Costa Rica

1. Describe the performance (see "Exportwert in 1000\$") of the from Costa Rica exported bananas.

Additional task: Speculate on why the working men from the banana plantations do not benefit from this development.

2. Compare the development of the **total production** with the **cultivated area**. Give reasons why those two ambits did not developed parallel.

3. Compare the development of the banana-**total production** with the banana-**export value**.

Additional task: Think about what the fluctuations of the export value for the last 15 years could be linked with.

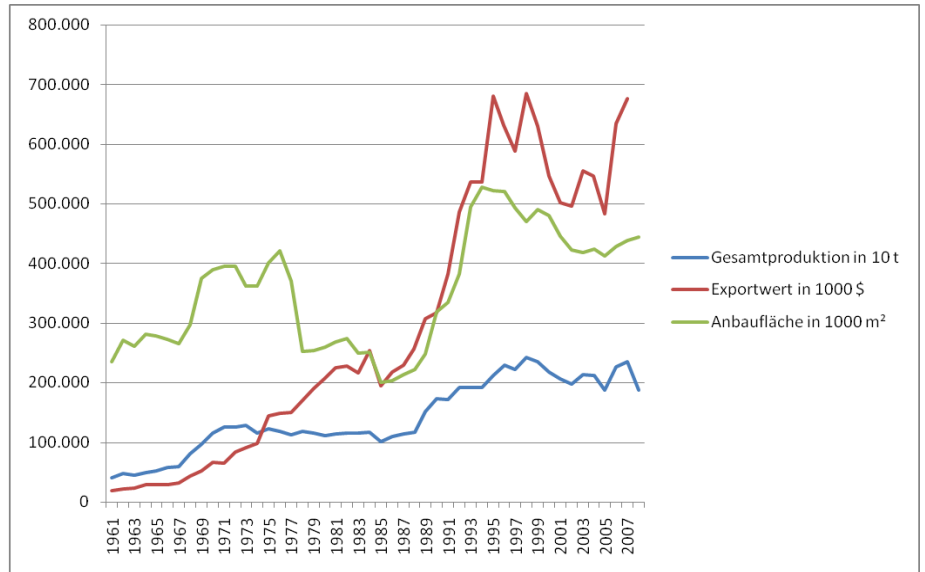


Abb.1: Vergleich von Gesamtproduktion, Exportwert und Anbaufläche von Bananen in Costa Rica (Datengrundlage: <http://faostat.fao.org>)

M2: Banana cultivation in Central America

4. Check while using the diagram (M1) and the map (M2) the following statements:

- a) "Most of the bananas grown in Costa Rica are used for own needs."
- b) „In 2005 16,2 Mio tons of bananas were exported. Almost half of those bananas Bananen came from Ecuador respectively Costa Rica.“
- c) „The economy of Costa Rica is as depending on the export of bananas as 50 years ago.“

5. Compare the development of the export of bananas of Costa Rica with two other central american states. Analyse both: Differences and similarities.

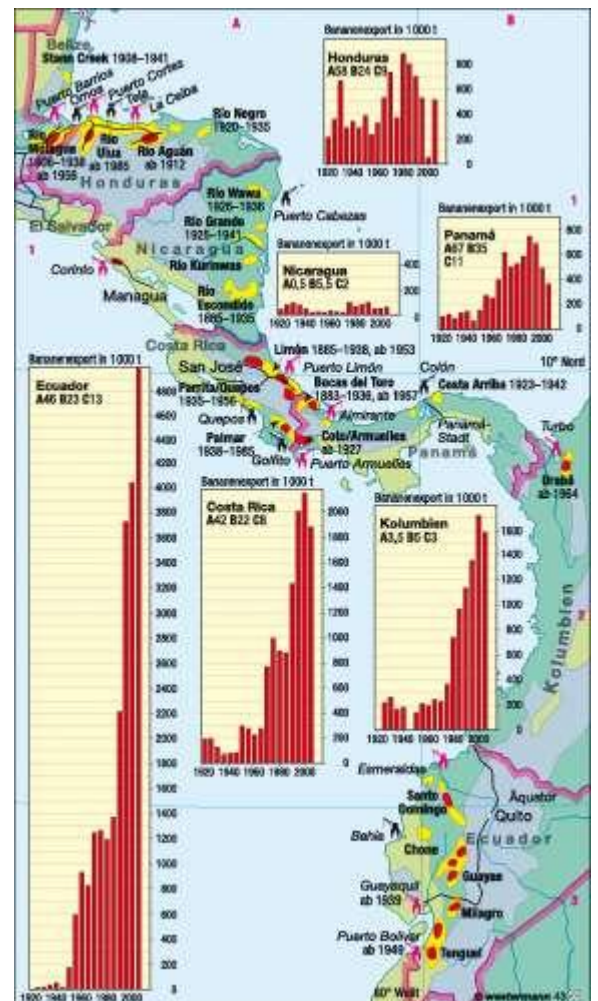


Abb.2 Bananenbau in Mittelamerika

(Credits: <http://www.diercke.de/kartenansicht.xtp?artId=978-3-14-100700-8&seite=217&id=5222&kartennr=3#>) [13.07.12]

M3: Should the banana plantations in Costa Rica be expanded?

6. Work with your partner:

- Take a checkered Din-A4-sheet and draw a so called "value square" (like the one on the right side) on it. Both lines are 10 cm long.
- Read the statements of the different persons (see below) and check if you understood everything or if there are phrases you do not understand.
- Enter the number of the persons on the point of the horizontally line with a pencil where it fits best in your opinion.
- Think about at what point of the vertically line the persons should be placed and enter the numbers on the lines.
- Draw as if you are drawing a coordinate into a coordinate system 90°-angle guides from both lines (vertically and horizontally) into your value square and enter the numbers of the persons on the intersection of those lines.



Quelle: eigene Darstellung

1) Diego Fernandez (working man on the plantation):

„Since the multinational banana companies are here many things changed. They promised a better life to us: a job with which you could earn a lot of money, good roads, department stores, simply a better supply with everything you need to live. The living condition turned a bit better but we've lost a huge part of the rain forest because the plantations are placed there now and our rights are restricted today, too. And also if I have a regular work and earn my money in time it is only enough for my daily needs. I can't put something aside.“

2) Pedro Sánchez (doctor in the city Matina):

„Constantly banana worker come to me because they are seriously ill but I can't help them – they don't have enough money and I can't medicate all for free otherwise I also have no money to live. The working-men constantly have contact with pesticides on the plantations and also at home they aren't protected before these poisons because also water and grounds are contaminated.“

3) Martin Maier (Student in Germany):

„Today I bought some bananas. They were in sale and really cheap. When I noticed that they had a long way behind (they come from Costa Rica) I first wondered but later I was excited doubly. I would be glad if they stay as cheap as now because I earn only a little bit of money in my holiday job.“

4) Julia Rombach (conservationist from Germany):

„I think it's outrageous how much of the rain forest is grubbed for more and more banana plantations. Thereby the diversity of plants and animals of the rain forest is endangered. By the monoculture of the plantations, which means that huge areas are planted with the same fruits, there's a high risk for the banana plants to be attacked from pests. That's why the plantation operators use so many pesticides and poison thereby the nature.“