

sScreen – Fast Tract Estimation of Carbon Benefits from Forestry Activities  
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In my professional life, I experience often the field of tension between what science would like to do, what policymakers think that is important, and what people in the field need, what they want and what they are able to do. This tool has been an answer to these difficulties that we have observed between what has been said by the policymakers, what science is requiring, and what people at the field are able to do.

I would like to make a statement at the beginning and say that the forestry sector has improved a lot over the past decade. There are still difficulties but there is plenty of information that we need to use in a smart and in a transparent way.



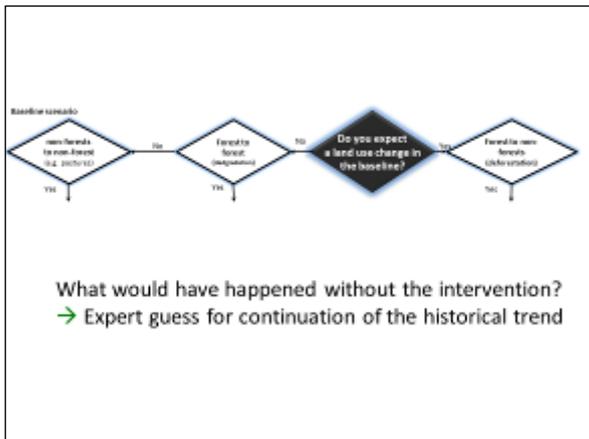
This is a landscape reality. This is a real picture of a real country with a landscape mosaic including plenty of different possible uses. However, one would need six different accounting methodologies for realising the benefits

, one for reducing emissions from deforestation, one for carbon enhancement, one for sustainable forest management, one for reducing degradation, another one for the A/R CDM<sup>1</sup>, and if you are lucky, something for pasture and/or another one for carbons substitution through harvested wood products. Do we really need this level of complexity for making ascertained management decisions? Are people outside able

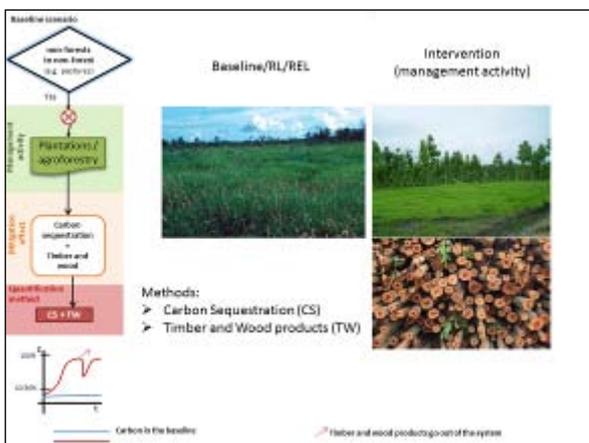
<sup>1</sup> Afforestation and Reforestation Clean Development Mechanism:  
[https://cdm.unfccc.int/Projects/pac/pac\\_ar.html](https://cdm.unfccc.int/Projects/pac/pac_ar.html)

to use complex methodologies in an accurate manner? Is that really increasing global accuracy? Does it make sense?

sCreen is a tool created for getting a good sense of potential mitigation benefits from different management options. Results from sCreen can create a good basis for comparing benefits from different REDD+ options and for getting into a informed discussion with stakeholders and decision-makers. The tool sCreen includes five accounting methods, that have been build up in a consistent and comparable manner..



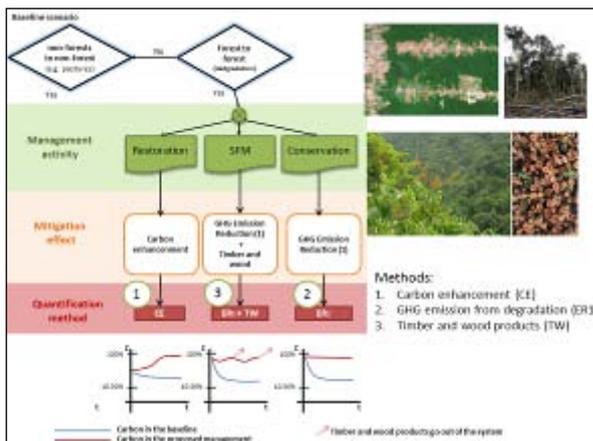
What happened before any type of intervention? We have this type of situation. On one side we can have a forest that will be converted to non-forest. That is what we call deforestation. On the other side, we can have forests that will be forests in the future, but will be degraded. To the far left, we have non-forests that without any type of intervention will be kept as a non-forest. I will walk you through all these possibilities for a moment.



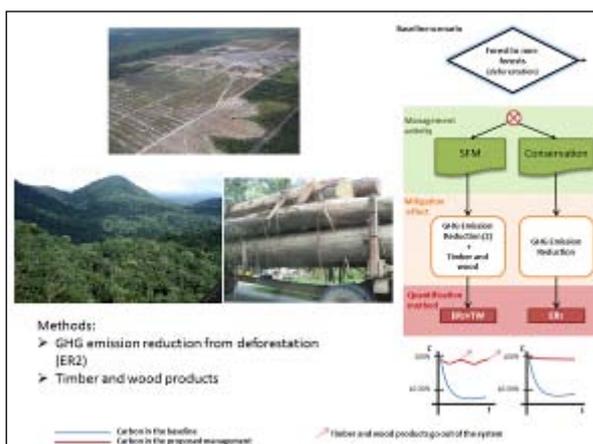
The first option is we have non-forests that will be in the future non-forest. If we do not do anything, it will be maintained as a non-forest (e.g. pastures). In our intervention we propose a management activity that change this land-use and create forest (e.g. agroforestry or plantations). We have the effect of carbon sequestration and we can produce timber and wood products. For accounting the mitigation benefits we will have a method called carbon sequestration. If you look at the curve below at the left side, you see a blue line indicating what will happen without your intervention and a red line indicating how the carbon curve of your management activity looks like. The red arrows indicate when timber/wood products are extracted

from your system.

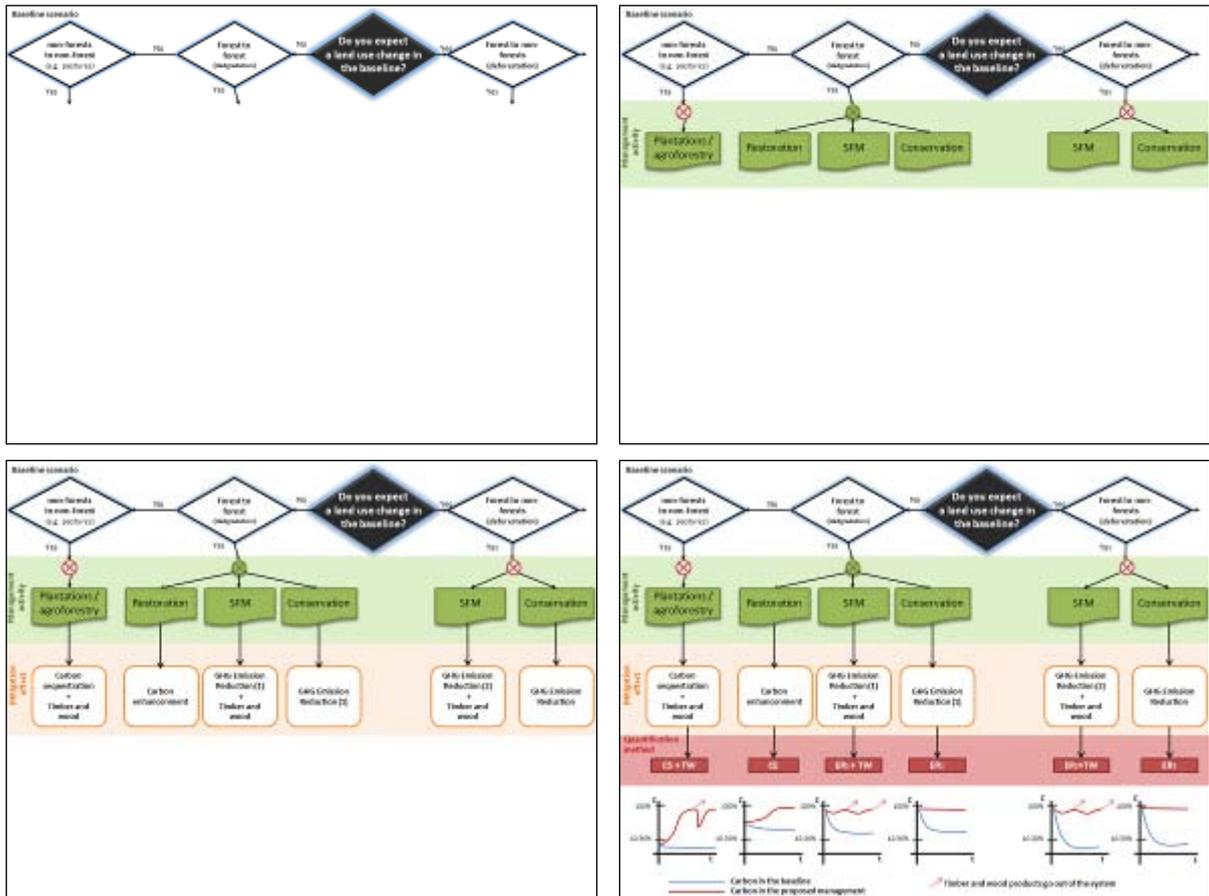
For the climate change community, the wood that goes outside cannot be accounted as part of your intervention. Under the UNFCCC these products are called *harvested wood products*. There is an ongoing discussion about how to deal with harvested wood products. One option is to use it as an input replacing an energy more intensive material. That is carbon substitution. In sCreen we don't quantify the substitution potential because there are various substitution options. However we account the input that wood would provide to the carbon substitution effect.



The second effect that we can have regards to an increment of carbon stocks in areas previously degraded, e.g. through restoration. This effect is called carbon enhancement. If we enhance carbon, because we make enrichment planting for example, we can in the future also produce timber. Or, if it is not too much degraded at the moment and we can do sustainable forest management, in this case, we still produce timber and wood. There are several possibilities for facing forest degradation, as you can see in the slide.



The last possible effect that we consider is when we have forests that would be deforested and our management activity is aimed to keeping it, either through conservation (e.g. a national park) or we declare it these areas are sustainable forest management area. In any case, we will have a greenhouse gas emission reduction effect and if we have sustainable forest management, then we will have also timber production. Again, you have the curves showing these options in the low right part.



Summarizing: one can have different baselines or reference scenario (first line), then according to the starting situation different management options are possible (second line). This allows different mitigation effects that need to be estimated correspondingly. The tool sCreen allows estimating the potential mitigation effects of all forestry activities, using only one methodological package. One can create as many scenarios as needed in a easy and fast manner. This information can facilitate discussions with local stakeholders, decision-makers and investors and can help to find a balance between climate change mitigation and another priorities at place. Having only one methodological package is important because in reality forest users combine management practices (e.g. reducing deforestation and promoting plantations). It is very rare that people say, "I am going to stop deforestation, but I do not have any type of agroforestry plantation for food security." What happen in the reality is that you have a combination of these activities. Someone saying, "I will stop deforestation, but I would have sustainable reduction of food." Someone else says, "Yes, but I would have medicinal plants," and someone else says, "Yes, and I will plant agroforestry trees for increasing food production." You need something that allows you to account for all these carbon effects at once in a consistent and comparable manner.

### sCreen includes

- 5 methods
  1. Carbon sequestration (CS)
  2. Carbon enhancement (CE)
  3. GHG emissions from degradation (ER1)
  4. GHG emissions from deforestation (ER2)
  5. Timber and wood products
- Treatment of leakages
- Also data requirements, considerations for stratification, consideration of time frame, consideration of biodiversity
- Results of sCreen are approximations aimed at clarifying potential carbon benefits in an easy manner.

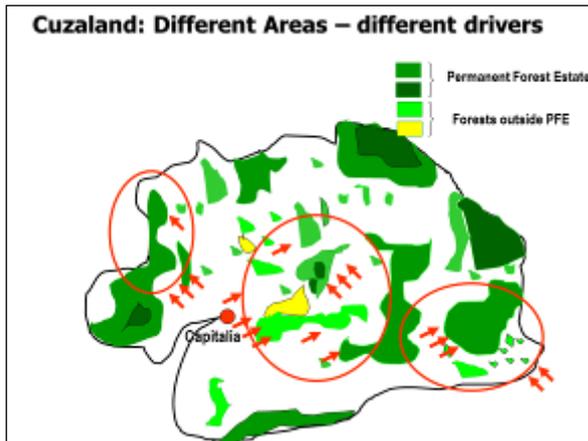
The tool includes five methods: one for carbon sequestration; one for carbon enhancement; two different ones for greenhouse gas emissions of degradation and deforestation; and the fifth method is in order to quantify timber and wood products. Further it includes a procedure for treating leakages, and a list of data requirements. We do not want to go to the highest possible level of accuracy. We want to provide policymakers and stakeholders with enough information for making decisions.

### General assumptions and clarifications

- ✓ **Historical trend** as the starting point for the reference scenario
- ✓ The methods consider **living biomass** (aboveground and belowground biomass). If litter, dead wood or soil organic carbon of these three pools is considered as potential significant emitter, other methods should be used.
- ✓ Potential carbon benefits from timber and wood products are accounted for separately through a specific method.
- ✓ Considers two degradation drivers: firewood/wood gathering and illegal logging.
- ✓ We estimate carbon stock changes, following the IPCC guidance. Positive values imply increase in carbon stocks, negative values imply decrease in carbon stocks (i.e. deforestation and degradation have negative values)
- ✓ Data (following IPCC tiers):
  - ✓ When available local values, if not
  - ✓ National data, if not
  - ✓ IPCC default values (GPG-LULUCF or 2006 inventory guidelines)

Above you can read the assumptions behind the tool. We consider the historical trend as a good starting point for setting the baseline/reference level. We only consider living biomass. We consider the carbon benefits from timber separately. We consider two drivers of degradation. These are firewood and illegal logging. We follow the IPCC tier approach. That means that, if you have information at the local level, you use this information. If you do not have it, you try to get information from your country. If not, you finally go to the IPCC default values. Although they are not perfect, but they are good enough to make a meaningful calculation.

You can combine the results of sCreen with many other of the methods outside



Let us imagine a country. The information that I will share with you is real information from a real country. However, I am not allowed to say which country, because it is still under discussion for the readiness phase of this country, so let us call it *Cuzaland*. The exercise is done at the national level. There is a permanent forest estate in Cuzaland and there is forest that is not considered as permanent forest estates and there are plenty of drivers for changing or for using these forests in different manners.

Deforestation - intact forest	Hectares in million
Extension of agricultural and livestock frontier (cover 90%)	15
Extension of agricultural and livestock frontier 2 (cover 70%)	12
Settlement (cover 90%)	1
Mega-infrastructure (e.g. dams) (cover 100%)	3
<b>Degradation - intact forest</b>	
Illegal cropping (cover 90%)	3
Illegal logging (cover 100%)	5
Firewood gathering 1 (Cover 90%)	1.2
<b>Degradation - secondary forest</b>	
Illegal crops (cover 70%)	0.50
Illegal logging (cover 70%)	2
Firewood gathering 1 (cover 60%)	3
Firewood and building wood gathering (Cover 50%)	10
<b>Forest apt areas (plantations and agroforestry)</b>	
Abandoned pastures	3
Biodiversity buffers (Rehabilitation)	10
Watersheds (Agroforestry)	1

This is the summary of these drivers. There are different drivers for deforestation, extension of agricultural livestock in a forest that is already at 90%. There is extension of agricultural forest, as well as other issues that are important in this country; settlements or mega-infrastructure projects. This is also the reality in many tropical countries. It is not only that deforestation is happening because of some illegal or not well thought out activities. For some development priorities, deforestation is occurring as well.

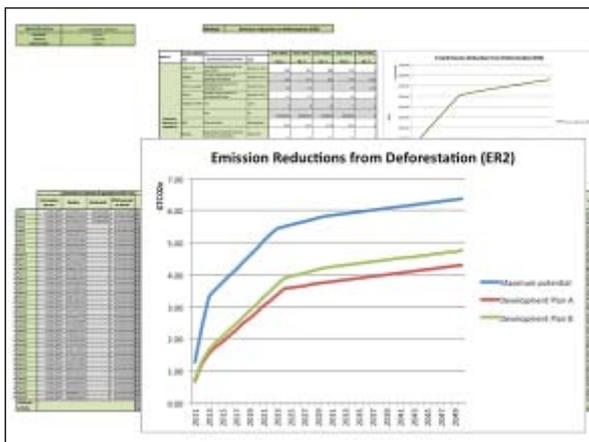
We have degradation of forests, and in this country we have illegal cropping. We have illegal logging. We have firewood gathering. We have degradation in forest that is already degraded, different type of activities.

Further, we have some areas that the country has declared as forest apt areas. These are watersheds, abandoned pastures, or biodiversity buffers. You have the amount of millions of hectares that are there. Some people in this country say, “Yes, we could use it for getting the maximum mitigation impact.” Others say, “Hey, are you crazy? We have development ideas in this country.” What you have really is that you have very different options. One, what is the maximum mitigation potential that I could get, if I really do whatever is necessary to mitigate climate change? There are other developmental considerations that can

be done. We have established three possible scenarios: 0 emissions, development A and development B. Development A and B differ according to options under discussion.

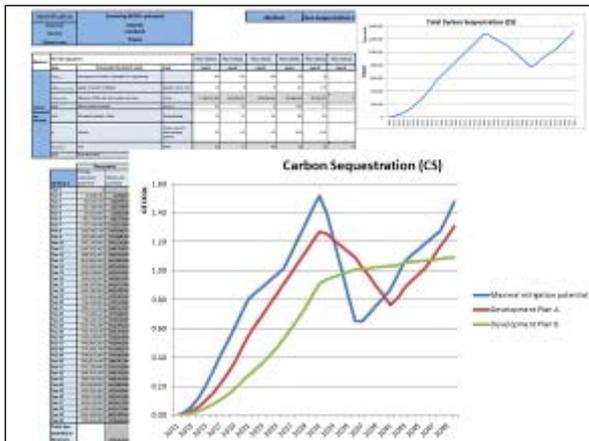
Management options	Processes	Emissions	Development Plan	
			A	B
<b>Reforestation - native forest</b>				
Extension of agricultural and livestock frontier (Forest 50%)	15,800,000	Conservation	Conservation	14M
Extension of agricultural and livestock frontier (Forest 75%)	12,800,000	Conservation	37M	Extension of agricultural frontier
Settlement (Forest 50%)	1,200,000	No settlement	Settlement with reduced impact	No settlement
Mega-Infrastructure (e.g. roads) (Forest 100%)	8,000,000	No infrastructure	Mega-Infrastructure	Reduction in agricultural frontier (27%)
<b>Reforestation - mixed forest</b>				
Large logging (Forest 100%)	8,000,000	No illegal activities	No illegal activities	Large activities in 20%
Large logging (Forest 200%)	5,000,000	No illegal activities	Conservation	Extension of agricultural frontier
Firewood gathering (2.2 times 100%)	1,200,000	No firewood	Conservation	Conservation
<b>Reforestation - secondary forest</b>				
Large logging (Forest 100%)	800,000	No illegal activities	No illegal activities	Large activities in 20%
Large logging (Forest 200%)	2,000,000	No illegal activities	Conservation	14M
Firewood gathering (2.2 times 100%)	1,200,000	No firewood	Conservation	Conservation
Firewood and building wood gathering (Forest 100%)	1,000,000	Reduced logging	Reduced logging	Reduced logging
Forest fire (area of 50000 and agricultural)				
Standardized activities	8,000,000	100% started in 5 years	100% started in 10 years	100% started in 15 years
Secondary buffers (habitat areas)	1,800,000	100% started in 5 years	100% started in 10 years	100% started in 15 years
Development (agriculture)	1,400,000	100% started in 5 years	100% started in 10 years	100% started in 15 years
Agricultural and livestock frontier (Forest)	700,000	100%	100%	100%

This matrix in this country looks like this. People are thinking about conservation, but also about sustainable forest management. They are thinking about getting reduced impacts from settlements, reduced impacts from these mega-infrastructure projects and so on. What have estimated all activities in the three scenarios using sScreen. You can compare them in the direction that you want and I will show you how it looks.

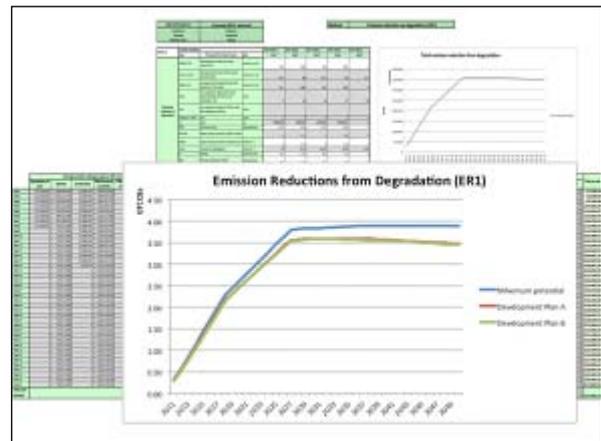
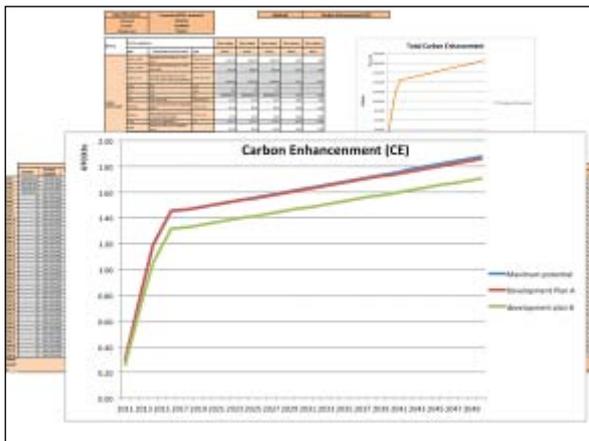


The first case is, that is one of the calculations for reducing deforestation and that is the comparison between the three possible scenarios. The blue line is the maximum potential. The red line is the development plan A and the green line is the development plan B. In this case, in the development plan B, we have more conservation and sustainable forest management. That brings us to a higher core for emission reduction from deforestation. Of course, the two development plans are far lower than the maximum climate change mitigation potential.

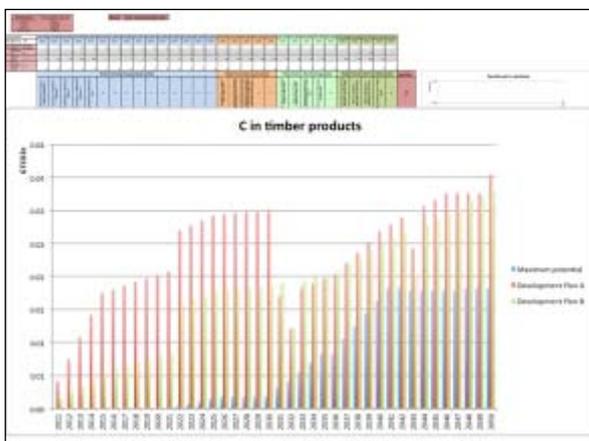
We did the same for old plantations. In the case of plantations we differentiated the length required for getting the full plantations. This is dependent of the level of investment available. We differentiate three scenarios 5, 10 and 20 years. We also considered different schedules for establishing the plantations.



Carbon sequestration in this tool includes not only plantations, but also agroforestry systems. In other examples that we have used in sScreen, we have built up carbon sequestration curves for agroforestry systems that were designed by the local communities.

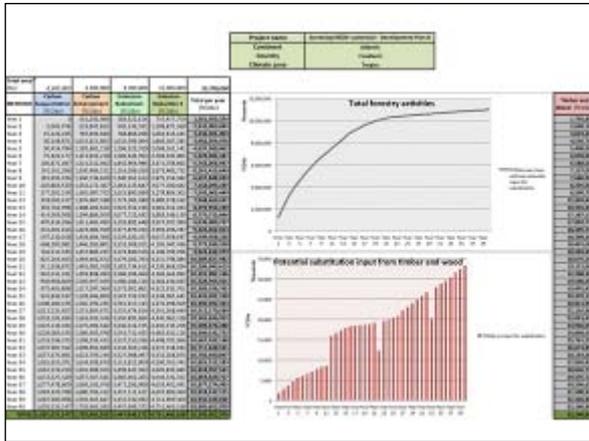


The same we did with enhancement of carbon and in this case, only one of the two curves was far below the maximum potential, and that is due to their specific activities. Third, we did the same with the emission reductions from degradation.

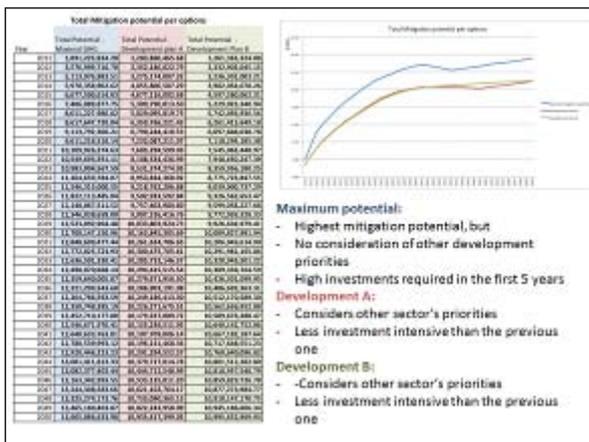


And finally we consider the timber and wood products. What you see here is in all cases you produce timber, but in the blue case, which is maximum potential, there is no timber production from natural

forests, neither secondary nor primary forest. What you have is the timber production at the end of the project that is the result of any type of plantations, whereas in the other two examples, we allow either some deforestation for development purposes and/or sustainable forest management.



With sScreen you can also build up each complete scenario complete. These are all possibilities combined for one of the scenarios. You have emission reduction from deforestation, from forest degradation enhancement, and carbon sequestration for one of the development options that you have. You can cross the comparisons wherever you want.



These are the aggregated curves. This is the net carbon effect. The baseline has been subtracted already. What you see here is only net carbon effects. The conclusions are quite simple if you want. The blue line is the maximum potential, but it does not consider any development priority and it has a very high investment requirements in the first five years whereas the other two have less mitigation potential but are better inline with development priorities and require less up-front investment.

Building up the sScreen scenarios for this country took us one week. The challenging and most interesting part were the discussions with the stakeholders for designing the different scenarios. Once we were in the country talking with stakeholders about what exactly they want to do, and the idea with it is that they can dedicate more time for two things: for creating the matrix that we have seen at the beginning that all these activities are considered, and for creating, and for analyzing which are the impacts of using one or defining one or the other way to go.

### Test phase - 2103

- ✓ Methodology design (2012)
- ✓ Methodology review by experts
- ✓ First calculation routine
- ✓ Tests:
  - Sub-national level (at different scales and with different number of forestry activities)
    - Colombia, Ghana and Malaysia
  - National level
    - Test country (using the current information from a real country)

sScreen was designed in a period between 2012 and 2013 as part as a ITTO project in the REDDES program. The methodology has been reviewed by three international experts. We conducted tests at the sub-national levels in ITTO projects in Colombia, Ghana, and Malaysia that have different extensions and different activities. The projects were completely different from each other. There was a project with 24 activities in Colombia. The project in Malaysia had only three activities in which we combined reduction of degradation and reduction of emissions from deforestation. In the case of Colombia, we used all five methods.

In the case of the national country, you have seen we have also used all possibilities with the tool and we are still open to the possibility to create more scenarios or to combine these scenarios in order to find what is the optimum for the country, not only from the carbon perspective, but also from the development perspective.

### Advantages of sScreen

- **One methodological package** for all forestry activities
- Allows **comparing** possible scenarios
- Allows **dialogue** among stakeholders regarding advantages and disadvantages of various management options
- **Flexible** regarding data sources and **cheap** screening option
- User friendly

THANK YOU VERY MUCH FOR YOUR ATTENTION!!

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The main advantage of sScreen is the possibility to estimate potential mitigation effects from all forestry activities with only one tool and one methodological package. You can include all possibilities in this sector through using one methodological set. That makes the results comparable. It allows dialog amongst stakeholders during the design phase and before management priorities are set. It is easy to use and you can produce a high number of scenarios. That means that you can compare many management options before making the final decisions. We do not pretend to have the highest level of accuracy, but we pretend to provide scenarios that allow policymakers and other stakeholders in the country to discuss and decide what are

the best management activities according to their priorities. It is flexible and it is cheap. It is based on the information that the countries have. If they have specific data from the country or from the local level, we use this data. If not, we use the existing default values (e.g. IPCC). Of course, for us who have built up the model, it is user-friendly, but we need more users in order to know how user-friendly it really is.