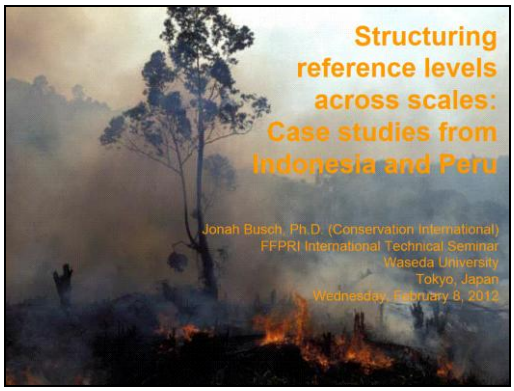
Structuring reference levels across scales: Case studies from Indonesia and Peru
Dr. Jonah Busch (Conservation International[118])



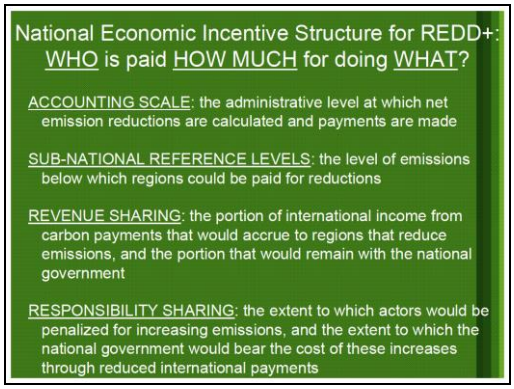
I will be speaking about a challenge which is faced by many of the forest countries, whose representatives spoke yesterday, and a challenge then also which is shared by any partner country interested in an offset mechanism as well.

This is the challenge. Under the UNFCCC rules, which have been developed, countries' emission reduction under REDD are accounted for on net at the national scale. A country would have its total emission reductions from forests subtracted from that any emission increases from forests. This is the amount which could be compensated by payments coming from partner countries. There is very good reason for this. This national scale, this national approach incentivizes countries to take systemic policy actions like reforming land titling, like reforming agricultural subsidies, or guiding where roads go into forests. This is also a way to manage leakage of deforestation activities within countries.

However, despite these positive aspects of national accounting, many of the decisions taking place about whether or not to deforest land within a forest country take place at the scale of the region, the district, the community or the household, the sub-national scales. It is the challenge of the

[118]米・バージニア州に本部があり、生物多様性の保全に取り組む NGO。http://www.conservation.org/sites/japan/Pages/partnerlanding.aspx

country to come up with a structure of economic incentives that will encourage these sub-national actors to reduce emissions and will discourage these actors from increasing emissions.



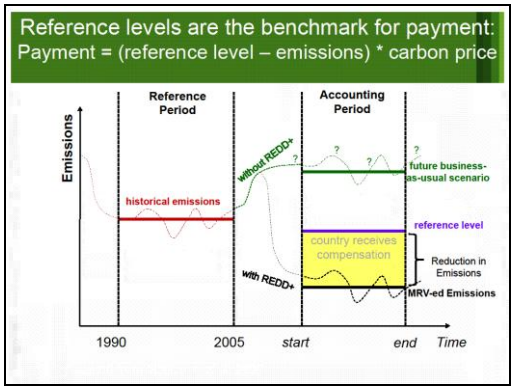
I call this the economic incentive structure for REDD+ and it boils down to this; who would be paid how much for doing what? It is really four decisions here. I will be describing these four decisions, which would be made within a forest country. Then I will be showing an example of some economic modeling that has been done by my scientific collaborators and myself. Then I will be showing an example of how this is progressing on the ground within a province within Peru.

Of these four decisions, the first is accounting scale. Within a country, it would be decided at what administrative level net emission reductions are calculated and payments made. Not only at the national level would there be an accounting scale, but potentially also at a district scale or at a lower province.

The second decision is about sub-national reference levels. Each of these accounting scales, each of these districts say within a country would have a reference level. I will show on the next slide graphically what that is, but that is the benchmark level of emissions below which a district could be paid for making reductions.

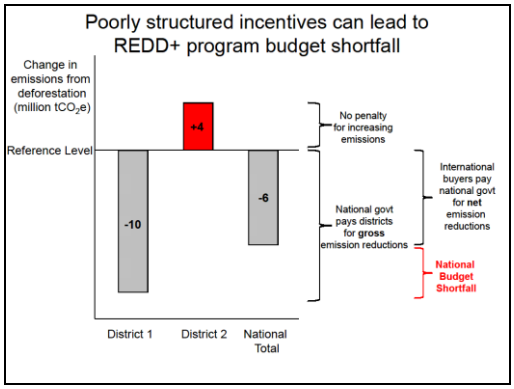
The third decision has to do with revenue sharing or benefit sharing. If there is a district which reduces its emissions, how much of the benefit from international carbon payments would go to that district? How much would be shared with higher jurisdictional levels with a larger region or with a country?

The fourth decision is about responsibility sharing. Are there any penalties to actors within a country that are increasing their emissions above their reference level?



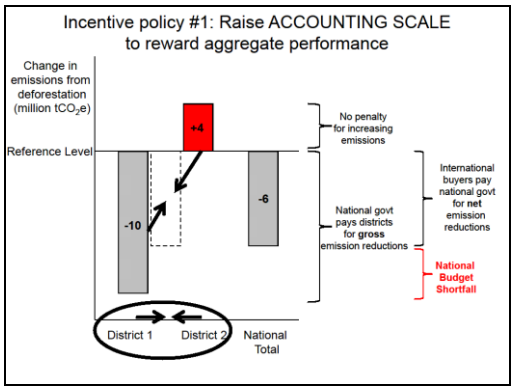
I am mentioning reference levels a lot. Reference levels are the benchmark against which payments under REDD are made. This may be the example of a country. This may be example of a district within a country. This dashed line which goes up and down representing emissions over time from a historical period. For example, 1990 to 2005 emissions are known. Looking forward into the future, these emissions are unknown. The green line shows a future business-as-usual scenario, which we do not know.

There is a reference level (the blue line). It could be equal to the historical emissions (the red line), it could be equal to the future business-as-usual (the green line), or it could be something different. But that is a decision which is made. Then over time into the future, emissions are monitored, reported and verified. If these emissions are lower than the reference level, the country or the district would receive compensation for this. If they are above the reference level, there would be no compensation paid for that.

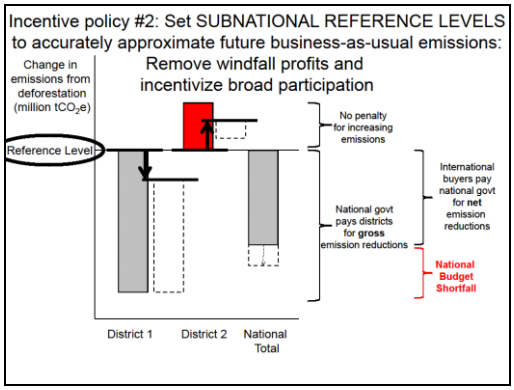


First, I would like to show you the negative risk. What could happen within a country with a poorly structured system of incentives? This is a system of incentives. You could think of it as just a very loose project-by-project, site-by-site approach to payments for REDD without any of these four decisions made, which I discussed. This is a simple country. It is not Indonesia. It is not Peru. It is a country with two districts only: District 1 and District 2; each with a reference level which sums to the national reference level. In District 1 over the accounting period there is a reduction in emissions of 10 million tons of carbon dioxide. In District 2, there is an increase in emissions above the reference level of 4 million tons of carbon dioxide. On the whole, with this net national accounting the country as a whole has only reduced its emissions by 6 million tons.

Under the UNFCCC rules, this country would be eligible to be paid for a 6 million tons reduction. International buyers pay national government for net emission reductions, 6 million tons. However, in this loosely, poorly structured incentive system, if the national government pays District 1 for a 10 million ton reduction, we see that there would be a problem. There is a national budget shortfall of 4 million tons. The national government pays 10 million tons to the district. It is only receiving 6 million tons from the international buyers. This is the problem. That is the bad news. The good news is there are four simple things which a country can do about it.

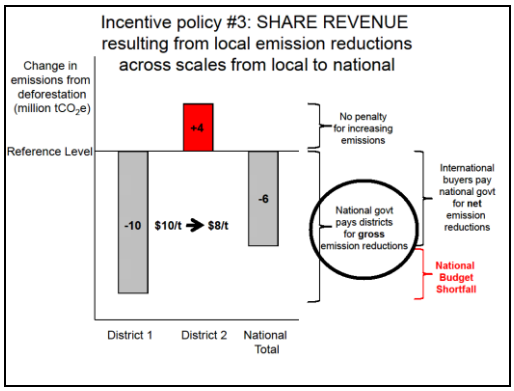


The first would be to aggregate accounting to a higher scale. In this case looking at two districts, they could be aggregated to one region. This region will have reduced its emissions by a net of 6 million tons here. This region as a whole, this aggregation of districts, would have incentives to manage and reduce its emissions within both districts. This is the first method for dealing with this potential problem.

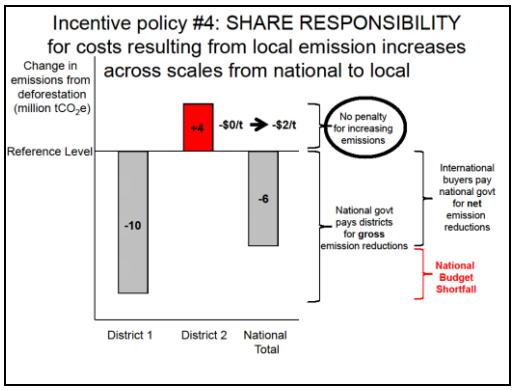


The second method is to adjust the sub-national reference levels so that they are a better reflection of true business-as-usual future emissions. I mentioned that we would not know the future perfectly, but we may be able to make a better guess of what is happening in the future than what is happening in the past. By setting reference levels closer to the future emissions, this accomplishes two things. In District 1, this removes a problem of windfall payments or so called hot air, where the district is paid for making reductions which would have happened anyway. In District 2, this gets rid of a problem of non-participation and broadens the participation so that District 2 which may not have had financial incentives to reduce its emissions relative to say development for

agriculture, now has a higher reference level, more carbon payments, and more incentive to participate in the system. This increases the emissions overall and will reduce this problem of a national budget shortfall.

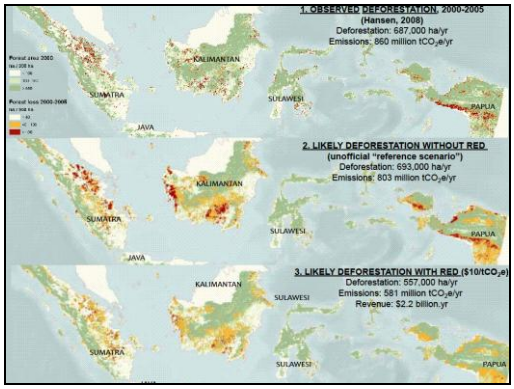


Third, we have revenue sharing. If the national government is at first paying $10 per ton to District 1, they could withhold let us say, 20 cents of every dollar so that they are paying them $8 per ton. This remaining $2 per ton would go into a national buffer account, as was sort of described by Naomi Swickard earlier. This would be used to offset the loss of international carbon payments from District 2.



Finally, the sharing of responsibilities of the costs of lost international carbon payments. In District 2, they would pay no penalty for having increased their emission reductions. There would be a penalty for the increased emission reductions, but those would all be paid by the national government because they would lose the chance to get those international carbon payments. This loss could potentially be shared with some of these districts so that they would pay a portion of increasing their emissions. These are four policy measures which can be taken to keep the national government running a national budget surplus from the REDD program.

In the second phase of this talk, I would like to show the modeling done by myself and my colleagues, applying these four policies within Indonesia. This is using a model of a software tool that we have developed called OSIRIS[119]. This is a click of a button spreadsheet tool in which different policies can be put in. The software turns a crank and it shows the output of the policy in terms of deforestation, emission reduced and revenue accruing to the national government and to the local scale. This software is free. It is online. It is transparent. It is open source. It is peer reviewed. It is published just recently here in the proceedings in the National Academy of Sciences. Importantly, this represents the collaboration between economists, geographers and policy experts, between non-governmental organizations, academia and within Indonesia the National Council on Climate Change and the Ministry of Forestry.

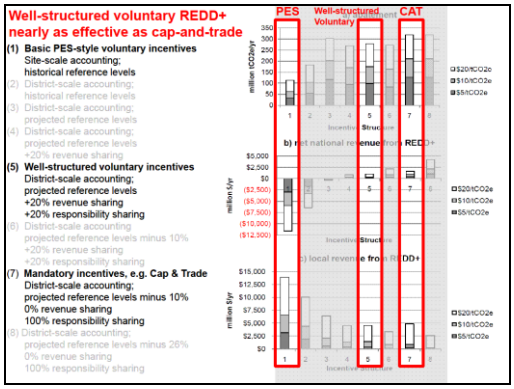


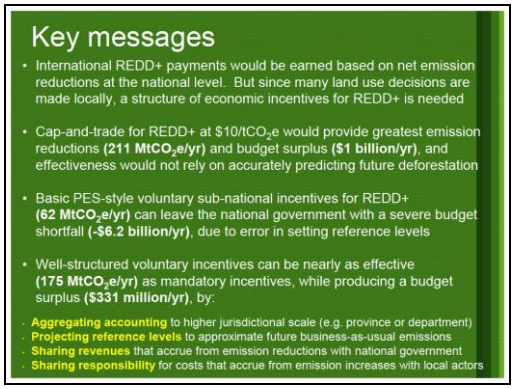
Very briefly, the way that this model works; we start with a map of actual deforestation within Indonesia. This is the top of the three maps. Green represents forest. The yellow and the red represent higher rates of deforestation in that location. Taking this map, we combine it with other maps about where there is larger or smaller potential for revenue from agriculture. There is a map that we have of the best crop, the most lucrative crop that can be grown anywhere in Indonesia under the prices from this 2000-2005 time period, and also maps of the slope, the topography, the remoteness of a site, whether there is protected areas there, whether there is concessions there for logging or for oil palm.

With this we create a map, the second map here, of which regions are at threat of deforestation

[119] Open Source Impacts of REDD+ Incentives Spreadsheet: http://www.conservation.org/osiris

going forward. The third thing we do is applying REDD policies. We apply a carbon price. The economic logic that we use here when trying to determine how local land users will respond to the carbon price is to look at how actual land users actually responded to the agricultural price in the past. What we would love to be able to do is take a time machine, go 20 years in the future, look at how REDD payments have been made across Indonesia and how people have responded. Without that time machine, we look back at how real people with real complicated Indonesia landscape have responded to higher or lower potential agricultural payments. With this logic, we see the affects of a $10 per ton carbon price. Looking between the second and the third map, the second map with no carbon payments, the third map with carbon payments, you see more areas of green, less areas of red, so a reduction of deforestation with carbon payments, and an associated reduction in emissions, and an increase in revenue.



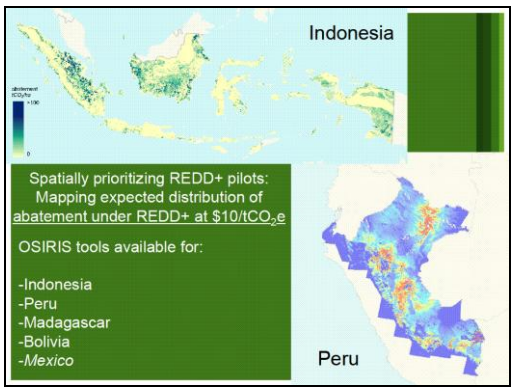


We were able to do this sort of modeling approach for eight policy scenarios of which I will show three here; the three in the red boxes to which you may focus your attention. The first is very loosely structured REDD system, site-by-site. The second is the well structured system, including these four approaches which I showed earlier. The third is a full mandatory system such as the cap-and-trade system, which has been implemented in Europe and New Zealand, discussed and proposed for Australia, South Korea, in the US at one point, and even in Brazil and elsewhere.

The top, this is the emission reductions every year under each of those policies. The middle is the national revenue accruing under each of those policies, the amount of money going to the national government under this system. The bottom is the amount of money going to the local recipients under each of the three policies. What you see is cap-and-trade, a mandatory program, has the most emission reductions and has the most money to the national government, and also positive money to the local recipients. However, looking on the left, the loosely structure REDD system has fewer emission reductions. It has a loss of money, this net government budgetary shortfall which I discussed at the national level, because many payments are being made to the local recipients for actions which would have occurred anyway.

By making these four adjustments to the poorly structured program to a well structured REDD program that is still voluntary in nature. Local actors can choose whether to participate in REDD or choose to keep doing what they are doing with agriculture, timber development. They only participate if it is in their financial interest to do so. It is actually possible to make a voluntary

REDD system almost as effective as the mandatory REDD system. We see in the middle here, the second red box, almost as many emission reductions, almost as much national government surplus around the same payments to local communities, so very effective these four polices for structuring REDD.



Now, this tool which I have mentioned OSIRIS. We have developed this tool not only for stakeholders and governments to use in Indonesia but also in Peru, Madagascar, Bolivia and in development for Mexico. One of the outputs of this tool is a map of where REDD can be most effective within a country. Thinking about a national government, which is deciding where to locate a pilot program, we look at Indonesia here, say, and the dark blue areas are areas where there would be a big difference between the emission reductions without REDD and with REDD. A lot of emission reductions without REDD, many few are with REDD. The same for Peru, we see these four areas of REDD. These are hotspots. These are good places for locating REDD projects or REDD pilot programs. We look at this left most REDD area. This is San Martin Province. This is where I will show a case study for Peru with the time remaining.

Conservation International has developed a pilot REDD demonstration activity here; a carbon project for sale to the Verified Carbon Standards with community climate biodiversity standards in place. The situation on the ground presently in Peru is that there is multiple of this type of projects which have currently overlapping boundaries for accounting, and there is different regions moving ahead at different speeds with REDD+. There is a need for a harmonization of reference levels across scales.

The Peru national government has proposed in its RPP[120] the following nesting or harmonization of reference levels across scales. Starting in Phase 1 with the current situation, where each project has its own projected future reference level. Moving to an interim Phase 2 where each region starts to develop its own reference level as they are capable. Within these regions, existing projects can grandfather or maintain their reference levels for a period of time. Finally, in the Phase 3, the final end goal here. Within the regions all of the projects' reference levels and the regional reference level are harmonized so they agree. The national reference level has been constructed by summing from the bottom-up the reference levels of each of the regions.

In the incentive structure, as I described earlier, Phase 1 or Phase 2 would be most like the one of the left, the basic incentive structure. By the time they reached Phase 3, they are in the well structured incentives as I have weighted out here. I hope this has provided a little bit of clarity to some of the four simple options which are available to any country which is trying to figure out how to reconcile national accounting for REDD with implementation at the local level.

[120] Readiness Preparation Proposal