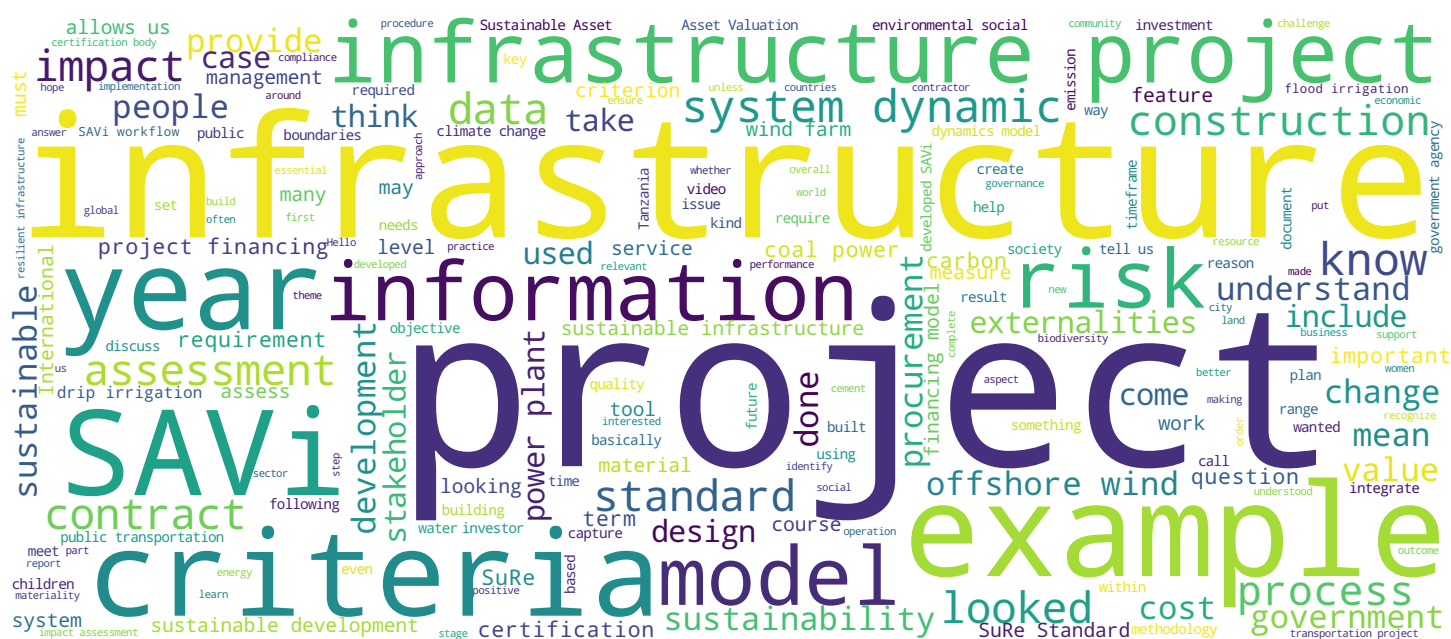


Building expertise on sustainable and resilient infrastructure

Panel Discussion





- Hello and welcome back to another video lecture of this week. Our focus today will be on Sustainable Asset Valuation or SAVi for short, which was developed by the International Institute for Sustainable Development. Joining our discussion today is a public procurement for sustainable finance team from the IISD and I have the pleasure to welcome Oshani Perera and David Uzsoki, Andrea Bassi and Liesbeth Casier. SAVi, as the name suggests stands for Sustainable Asset Valuation methodology and what is new about this methodology is that it is a simulation derived methodology. So governments and investors can use it in order to design and simulate the investment into sustainable and resilient infrastructure. So Oshani, tell us why did you developed SAVi? What was the motivation behind? - The motivation, Katarina, was really the fact that if you want infrastructure to be a catalyst for sustainable development, we have to recognize that unless the asset itself is sustainable, there occurs a range of environmental, social and economic risks across the investment lifecycle right from project planning on to construction and on to operations and management and unless we understand these risks better and we can put a financial value on the cost of these risks, we aren't able to value the totality of sustainable infrastructure.

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0m 05s



And the second reason we developed SAVi is because when you build a road or railway or power plant, there are a range of externalities. Some of them are very positive. It helps increase GDP, brings connectivity, brings electricity to rural communities but on the other hand it roads across rainforests, completely destroy the whole ecosystem, pipelines in and around coastal areas bringing so much environmental damage that negates some of the economic benefits that these assets bring. And we need to get a better hold of the costs of these externalities, so we developed SAVi to identify these externalities and also to provide a financial value to them and why? Why is because in a traditional financial analysis, this is ignored. - Okay. Thank you very much. Andrea, if I understood, you have been one of the co-architects of SAVi. So can you tell us how does SAVi works? - So SAVi is pretty much funded on a modeling approach that integrates knowledge. And so for being able to assess the impact that infrastructure has on sustainable development as an enabler for development, we use qualitative and quantitative modeling approaches. On the qualitative side, we map the system.

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1m 55s



So we try and explore the complexity of the world we live in and so we look at how the drivers of change of today's ways of doing things, conventional infrastructure, compared with sustainable infrastructure. So, how we can deliver on the sustainable developing goals and the several indicators that are used to measure them. Now once you have identified what are these key drivers of change, we start quantifying these linkages and these connections across sectors, across dimensions of development, across economic actors because we look at those who finance the project, those who use the project as well as governments. And for this task we use two models. We use system dynamics as a methodology that is created to integrate the different dimensions of development so social economic and environmental indicators and project financing models because these are the models that are used, state-of-the-art models that are used to effectively carry out the economic assessment of the viability of an infrastructure project. So we link these two approaches to make sure that we can value the outcome of infrastructure to society with that systemic approach but also the value for investors to invest in this project.

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3m 26s



And so it's the soft side where we do the mapping of the elements that drive change and the quantitative component that links together these two different methods; biophysical on the system dynamic side and more economic on the project financing side that delivers value to other stakeholders. - Tell us why did you use or why do you use the system dynamics approach for the SAVi tool? - The system dynamics is useful because it allows us to look at how reality works. It helps us capturing feedback loops, delays nonlinear effects. So it allows us to put into a model the features of reality. Basically the reason why we get fooled by reality when there are side effects emerging, when something happens you didn't expected, either good or bad. So in a way it allows us to simplify complexity by representing it in a realistic way. How this is done is by integrating different fields of knowledge. System dynamics is designed for that. It looks at how systems work. So we are able to capture these three main factors. We have feedback, delays and nonlinearity by using stocks and flows. So we are able to link together economic drivers with social drivers and environmental drivers in one single modeling framework and that's why it's so interesting for us.

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4m 36s



The reason why it's essential for SAVi and the reason why we use specifically this methodology is that it allows us to do an economic valuation of the risks and externalities that then are brought into the project financing model. And as a result, what comes out of the project financing model the cost of financing of infrastructure is fed back into the system dynamics model to complete what we call an integrator or societal cost-benefit analysis. So overall what we have done is that we have looked at different methods and models, so we scan the literature, of course. We looked at what are the state-of-the-art models that are really being used because we don't want to reinvent the wheel with a single model because there is no perfect model per say and we look at what are the features of sustainable infrastructure that have to be captured by models and these two system dynamics and project financing models are the clear winners but only if we link them together.

- Thank you very much and David, I have understood that SAVi can really assess how sustainable infrastructure can generate higher or better financial returns than the infrastructure solution. So can you elaborate on this a bit?

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5m 51s



Can you explain with examples? - Yes. Sure. Sure. No problem. So I mean, as you know, often system infrastructure costs more. So pressure [...]. They sometimes wonder whether, you know, is this an additional cost worth it? So that's basically the question that that, you know, we are trying to answer here. So I can give you one example for example. When you look at, so we have done an assessment in the North Sea for offshore wind farm. We wanted to understand here that how would this technology compare to the coal power plant as an energy generation option. When we made the comparison, you know, using the traditional comparison analysis, you know what we saw that the offshore wind was doing quite well. It was generating internal rate of return about like 40% but the coal power plant seemed to be more financially attractive, you know, regenerating like an IRR of about 20% let's say. But we believe that this assessment is not what is thick enough because there are some very important environmental, social and economic externalities such as impact on sea food production, sand mining, the carbon, I mean the cost of carbon, the social cost of carbon. That is very important for the people of the Netherlands.

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7m 01s





So what if the factories exit the scene and then try to assess how the offshore wind farm is doing compared to coal power plant. And what we saw that when you actually include these assets in your calculations, the offshore wind farm significantly outperformed the coal power plant and then the next step what we did, what if we include so-called climate related risks as well in the cooperation. Just to give you an example, it could be like carbon tax, it could be like one point five degree temperature change, for example. So how would the two compare and again you know what we find that the offshore wind is doing significantly better than the coal power plant. And again we are talking about pure financial perspective. So it's that financial analysis that we have done here and numbers speak for themselves. Other financial indicators that we measure, you know, it was IRR or net present value. If I place ratios they all do much better for offshore wind. One example I can share with you is we have done selfsame application in Tanzania. What we are trying to understand how different irrigation technologies compare to each other.

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8m 34s





We looked at the flood irrigation as a baseline and try to understand you know how, I mean is this financially viable and what we find that it was okay. It was just barely bankable. When we looked at drip irrigation under the normal code method analysis, it performed quite badly so it was not financial viable but when we integrated the economic benefits of all same water and composition to farmers and the cost and social cost of carbon then drip irrigation actually became bankable and even the high cost version of drip irrigation became her on par with flood irrigation and the low cost drip irrigation significantly outperformed the flood irrigation option. - I understand that for your assessment I would assume the timeframe you're looking at really makes a difference, so what are the timeframe you looked at in the project Netherlands and what is the timeframe you looked at in Tanzania? - We actually looked at, I mean, what we have to look at is what is the last time of the project. Is it 40 years or 20 years? In Netherlands, I think we looked at 40 years so basically that's the last time of core project and the offshore wind farms next time can be extended to 40 years because normally its 20 years but if you change the turbines up to 20 years you can actually operate the use the same foundations up to 40 years.

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9m 51s





In case of the Tanzania, it was four years. - Okay. Thank you very much. Well these situations you are looking at, you guys are sitting, are so complex with so many potential repercussions so is that so how do you do these assessments? What is the process and how do you interact with the government and then finalize it? - So we have a typical SAVi workflow what we would call it and there are a couple of parts of that workflow that I think are worth emphasizing and one relates back to what Andrea was explaining on a feature of the system dynamics model, which is basically to start drawing some boundaries on what's the systemic view that we are going to take, where are we drawing the line and that is something that we do actually meets the client government or the clients private investor or the asset owner issues each of a specific infrastructure projects. So what we will do there is to start looking at material risks and externalities that are relevant to the specific infrastructure projects. One of the first aspects in that SAVi workflow that's really essential is about our interaction with the client government that is its owner or client private investor for whom we are preparing the semi-assessments.

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11m 25s





And that is to define the boundaries of what are material risks and externalities related to an infrastructure projects. So for example in Senegal, what we did was an application on a Bus Rapid Transit Project which is a public transportation project for the city of that cash and there with the government agency that is monitoring and following the implementation of that project. They were very interested in particular macroeconomic indicators in terms of job creation and the impact on GDP that they wanted to know what with the public transportation projects bring because of course, public transportation is about improved mobility, better access to the job markets. So there is something that we wanted to provide with the SAVi assessments. That's something that we capture in the causal loop diagrams by an essential feature of the system dynamics model. There were other externalities such as avoided costs of pollution, avoided cost of emissions that the government agency was very interested in because they are looking to also feature that project as an improvement of the condition of the citizens in and outside the curve.

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12m 44s





So what we're doing there is really look at essential impacts of the public transportation project and we will start customizing the causal loop diagram based on the information and the discussions we have with the stakeholder. So a real added value of SAVi there is to not only bring that particular government agency to the table but also others; those who have the expertise on environmental impacts of infrastructure projects, those who have the information on what we need to happen in terms of social inclusion. Are there people going to relocate that when we built this project? How do we have we capture that and how will we then start monetizing those impacts and that brings me to, I think a secondary important step in SAVi workflow is to start obtaining the data on the impacts, the valuation of them and valuation in monetary terms. - So why do you get these data from [...]? I understand you discuss again with the stakeholders or the parties involved the living movements' right, the boundaries. So when it comes to macroeconomic data you probably get them from statistical bureaus instead but there are a lot of data you actually need so where do you get the data from?

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13m 57s





- So we have a whole list of documents that we actually discuss with the government agency in the case of Senegal that consists of the technical and financial feasibility studies, the environmental social impact assessment sometimes also the macroeconomic impact assessments and in this case we had quite some data availability already and what SAVi will do is actually integrate all those different sources of information into one assessment and that really brings valuable information to the table. - Great, great. Thank you very much. Oshani, where do you see SAVi in a 10 years' time? What is your hope for SAVI? - Our hope for SAVi is that it will become a trusted partner of both investors and governments in making decisions around the financing of infrastructure and in identifying and valuing the cost of risks that we would be able to recognize that sustainability or the lack of sustainability presents risks and costs them, value them. - And Andrea, you as a co-architect of SAVi, let me ask you one more question. So what do you see the, especially the strength and competitive advantages so to speak of SAVi compared to other assessment tools or Sustainable Asset Valuation tool? - Well.

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15m 11s





I think it's fair to say that every model is built for a purpose and so we have a very specific purpose here. And the model is custom-made and tailored to answer the question from what are the outcomes of this sort of infrastructure and whether it's worth it or not. We have many other established tools in many different fields and sectors. We have systems engineering models for the energy sector, we have computable general equilibrium, macro econometric models for macro client performance, especially exclusive models for water flow analysis. So we're making use of all the knowledge and data and information that actually is generated by these models and we integrate them. So I think the true strength of the approach is that horizontal integration that we do rather than digging deeper into the details in each sector, we try and provide that systemic view. And if that is a coherent view of what infrastructure does, then it supports the dialogue that very few models and research exercises actually manage to create. And so that's what we are set out to do. It's to create a tool that integrates knowledge properly, make so that every person involved in the process feels for that, you know if it's that it's worth it to enjoy in the process and come in and contribute to this process.

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So then we can trigger that change. And so it's that integration of knowledge is key and then fully customizing the tool, that's what we like to do. We learn of course, we do our work back on research and so on but we listen, we learn, we co-develop the models, we customized them, we co-develop the scenarios, we analyze the results with other stakeholders and it's the whole process, not just the tools. So the data we use, it's the whole process. It helps inform decision-making. - Again, thank you so much for coming in. It was a real pleasure to have you here. You will find more information on SAVi and the ISD and the boxes below the video. Thank you very much.

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