Sustainable Transportation Systems
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Lecture 59
Sustainable Transport Appraisal Rating (STAR)

Hello friends, you may recall last time we discussed sustainability indicators or rating systems also and proposed by several institutions like World Bank or IMF and other even educational institutions. Today in that series we will discuss about Sustainable Transport Appraisal Rating system which is known as a STAR rating system and it is proposed and developed by ADB Asian Development Bank. And after this briefly we will also touch about climate change performance index.

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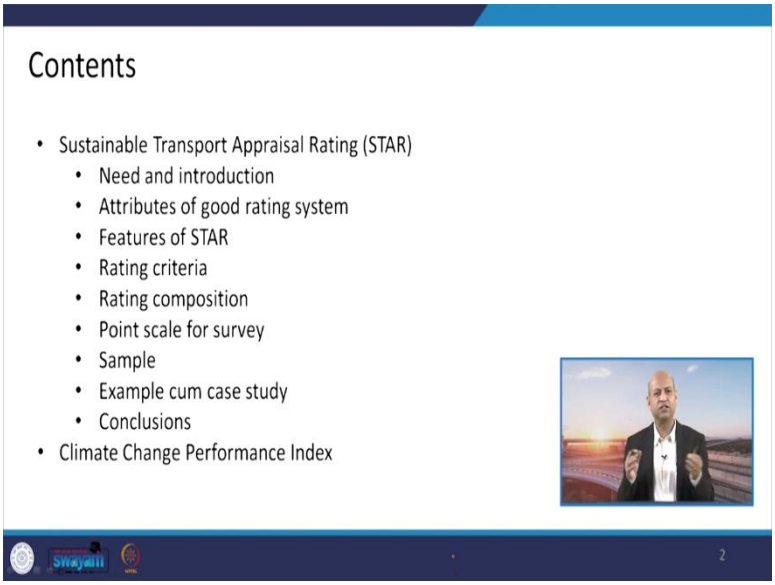

So, in that way you will be able to appreciate all types of indicators and rating systems which helps us to know about the stage or level of the sustainability in a particular project or a particular activity. Even we can also compare different countries in terms of sustainability performance. So, today this is related to sustainable transportation appraisal rating or STAR and we will discuss like about what is the need of this?

And what is introductory features? Then what are the attributes of good rating system? Means that there may be good rating system, bad rating system depending upon their attributes or features. Then special feature of the STAR rating system and what are the criteria which have been used in this particular system? And then how the composition of rating is done?

And what are the point is scale for survey? And then we will also see the sample and the example a kind of hypothetical case study where we can apply this rating system to see what happens when we apply step by step and how it is applied in reality? Then we will have concluding remarks about this STAR rating system and thereafter, we will look into climate change performance index and how different countries are falling in that particular indices performance.

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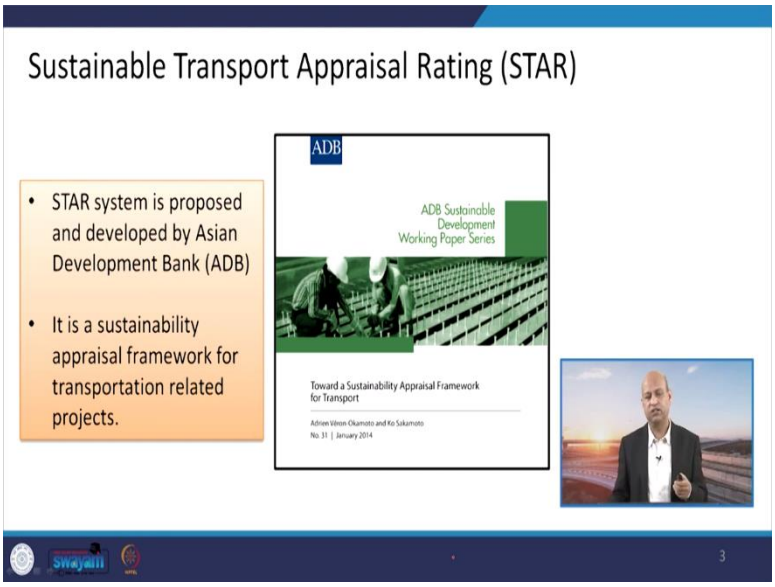

Well so, when we talk about sustainable transport appraisal rating system, this is basically as I said that it is proposed by Asian Development Bank and this is a kind of framework for transportation related projects. So, that means wherever transportation related project is to be funded by ADB. So, in this particular framework, it will be evaluated, it will be assessed and then the ADB decides whether it is okay to fund it or there should be some improvement to bring it at the level of funding proposal.

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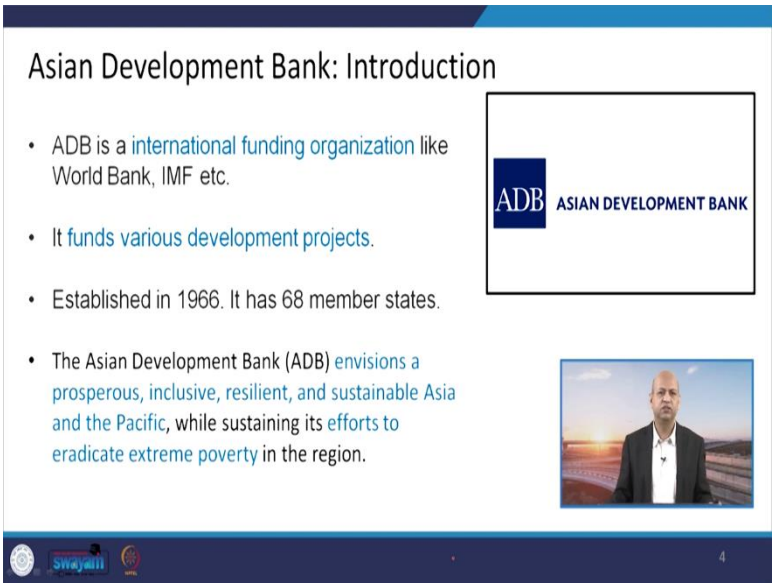

So, as you know, this ADB is an international funding organization like World Bank, IMF, etc. And it funds various development projects basically, this was established in 1966. And it turns around 68 member countries. And I, there is a motto, vision of this ADB which is like, it aims for prosperous and inclusive, resilient and sustainable development of Asia and Pacific region. And while making sustainable efforts to eradicate extreme poverty in this particular region.

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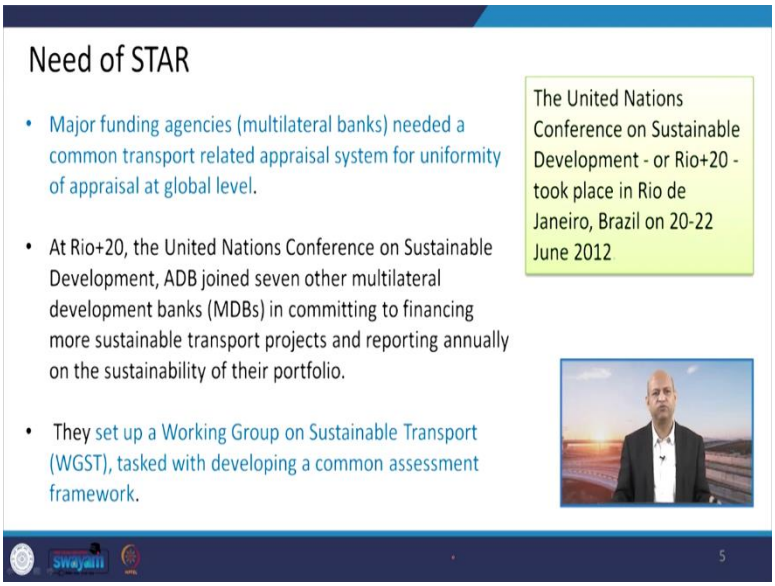

Well, what is the need of STAR? Why this was proposed basically? So, the United Nations Conference on sustainable development on Rio + 20, that was held in 2012. So, according to its the proposal, this particular framework was developed basically, and all the major funding agencies, these are known also like multilateral banks, they need a common transport related appraisal system for uniformity of appraisal at global level.

So that, if some proposal is going for one agency to another agency, then framework is uniform, and they can easily evaluate in a uniform way. Well, so ADB joined in this Rio 20, this United Nations Conference, which was held in 2012. So ADB joined other seven multilateral development banks MDBs, which are known in short. In making a commitment for financing sustainable transportation related projects, and then reporting every year on the sustainability of their portfolio.

So that way things are very transparent and people can appreciate there the things are being executed in the way which has been promised to those proposals. Well, ADB also set up a working group on sustainable transport which is known as WGST and this is a kind of taskforce which has this common goal for developing a common assessment framework.

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So, MDBs basically as I said that these are nothing but financial institutions, international financial institutions, which provide assistance in terms of grants and loans to developing countries basically or developing economies and. These are like World Bank, Inter American Development Bank or this Asian Development Bank, then African Development Bank, European Bank for Reconstruction and Development and new such more institutions are emerging in different regions.

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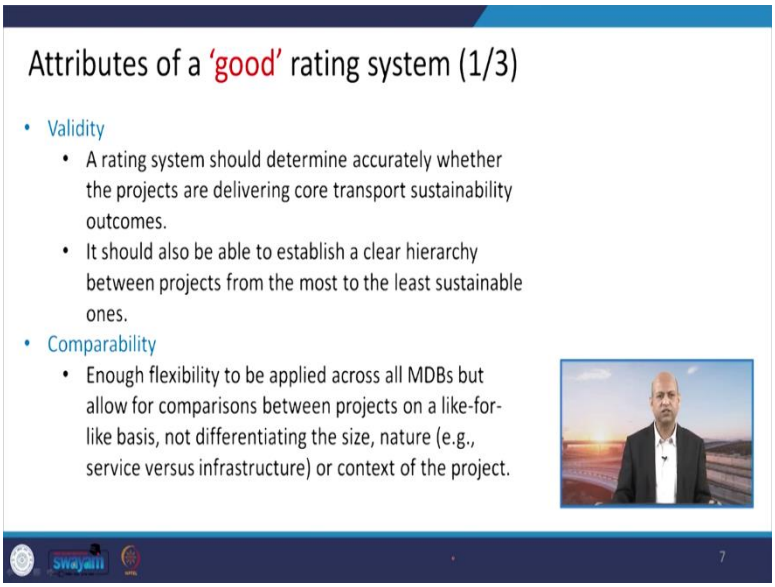

So, when we talk about rating system, so, for good rating system basically, it should be like different attributes for example, validity, comparability. So, basically when we talk about validity the rating system should determine accurately whether the projects are delivering core transport sustainability outcomes or not. So, that validity is to be done and it should be able to establish a clear hierarchy between projects from the most to the least sustainable ones.

So, the project as per the rating system if it is envisage that it is very most sustainable then it will be funded first and the least sustainable they will be advised to bring into some other criteria or other input so, that it can be go for the good sustainable criteria. Well, when we talk about comparability so, the flexibility of different aspects should be there so, that the projects can be compared like, like for the like basis. And without differentiating in terms of their size or nature and the context of the project. So, that comparability is properly established.

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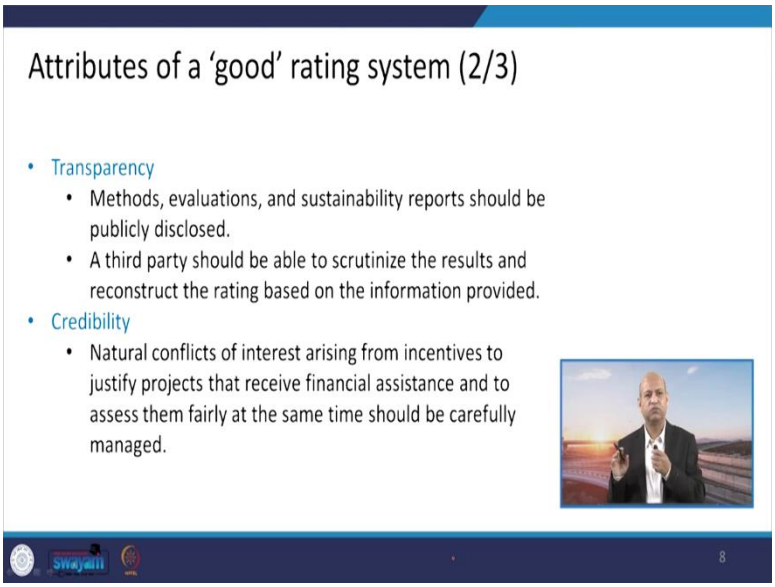

Then we talk about like transparency, so, the methods and then evaluation system, the sustainability reports they should be publicly available. So, people can go to the website they can download they can read, so, that transparency that kind of accountability is there and the third party should be able to scrutinize whatever results are there in the reports and they can also reproduce the results if they are really using those input data which are given there.

So, reproducibility should be there. So, that is the part of transparency when we talk about credibility, so, the natural conflicts of interest arising from like incentives to justify projects that receive financial assistance and to assess them fairly at the same time should be carefully managed. So, the credibility should be maintained in that way. There should not be like conflict of interest or some other things which are the gaps which can really reduce the credibility or people can challenge it there should not be there.

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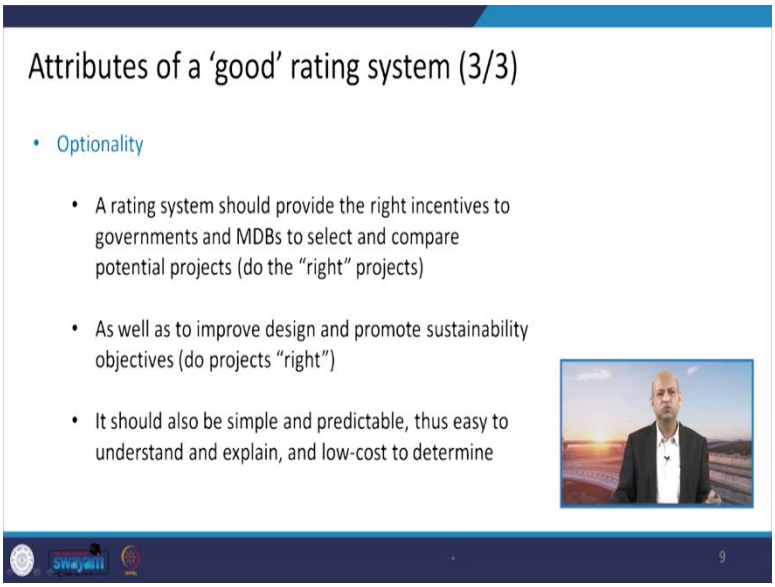

When we talk about optionality, so, the rating system should provide the right incentives to governments and these multilateral development banks to select and compare projects. The potential of the projects like right projects in the right way we have to do those kinds of things, and then it should be simple, predictable and easy to understand. So, that is the part of optionality.

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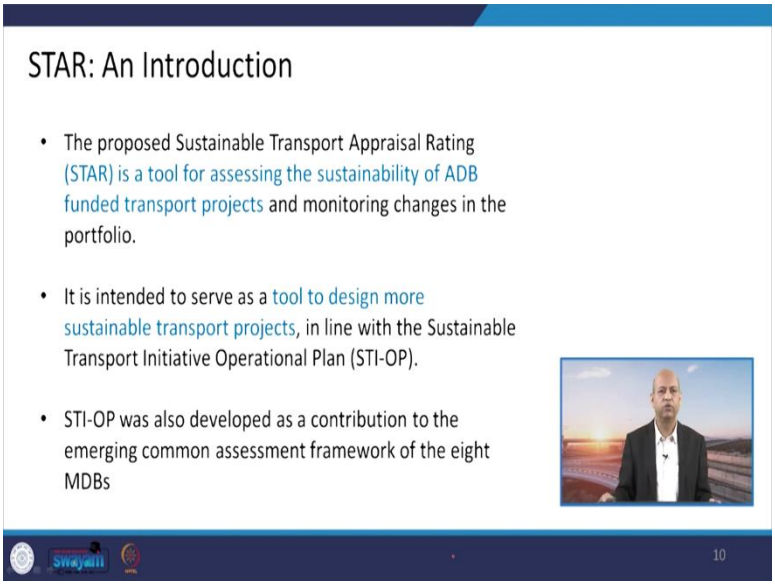

Then when we talk about these the introduction part of the STAR which was developed so, it is basically a tool, it is a basically a tool to assess the sustainability of ADB funded projects related to transportation sector and then how to monitor and whatever changes is there in the portfolio that should be there. So, it was intended to serve a tool to design more sustainable transport projects.

In the line of sustainable transport initiative operational plan, which was initially in fact it was developed as a contribution to the emerging common assessment framework of the eight MDBs. So, in that line, it was independently developed by ADB. So, that they can really go for a good scrutiny.

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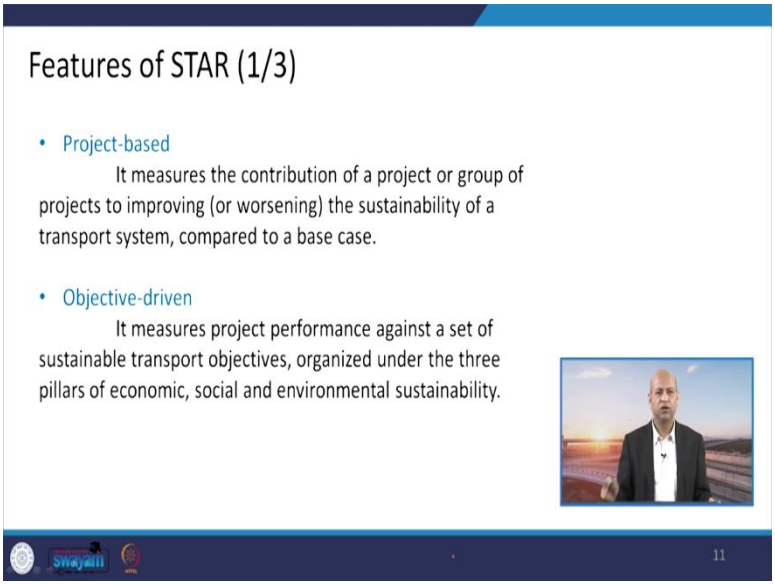

Well, when we talk about features of the STAR rating system then like project based or it is measured the contribution of a project or the group of the projects to improve or it is rather reducing the sustainability so what aspects are there? Whether it will improve that sustainability of the project or not?

So, project-based information must be there and then objective driven like the measures which are related to project performance against a set of a particular sustainable transport objectives. So, they should be organized under the three pillars of economic, social and environmental sustainability. So, that basic objective must be there.

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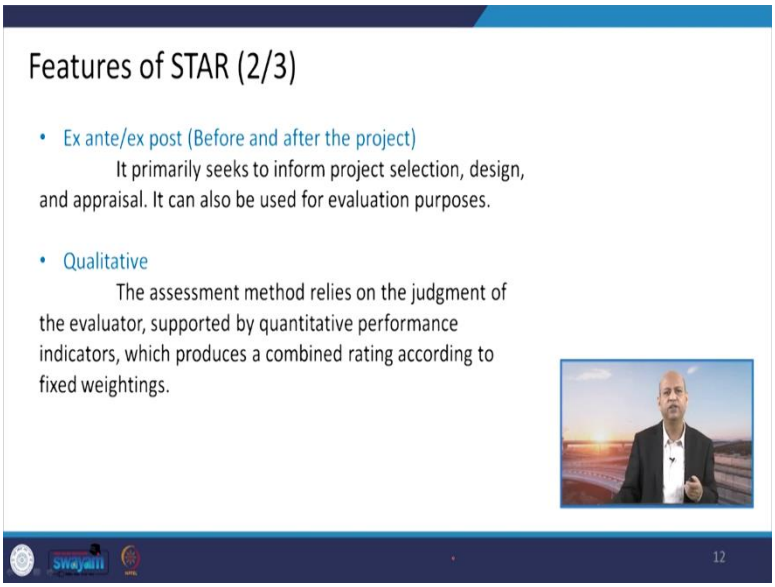

Then when we talk about like ex ante, ex post that is before and after the project, what will be the impacts and what kind of design criteria will be contributing in that way. If there is some difference positive difference or not. Then qualitative terms also features they are not only the quantitative but qualitative aspects are also there. So, the assessment method relies on the judgment of the evaluators or experts and it is supported by quantitative performance indicators which performs produces a combined rating according to the fixed weighting system.

So, the quantitative feature is there but qualitative is also there. Because, within the same quantitative range as some experts may give another figure or something like that, depending upon their experience and knowledge domain.

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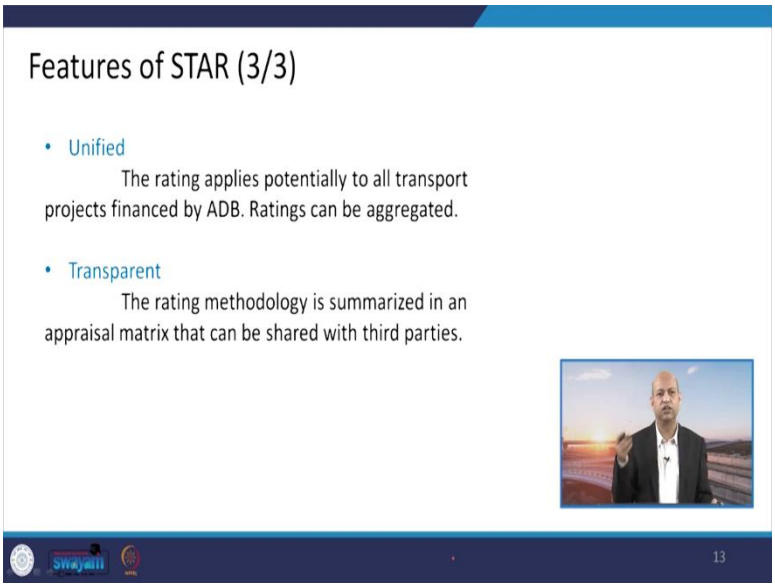

Then we talk about like it should be unified then we mean that rating applies potentially to all transport projects financed by ADB and the rating can be aggregated. So, that kind of unification is possible. Then transparent means, it has to be transparent as we already discussed that the information should be available to all and the matrix and the data everything should be it should be possible to share with the third party which can evaluate which can see it in detail.

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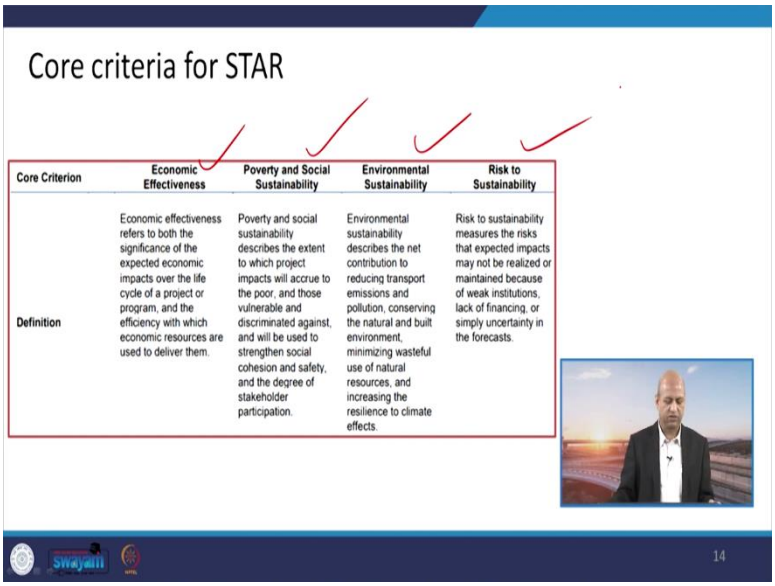

When we talk about core criteria for this STAR system then basically this economic effectiveness and the poverty and social sustainability, environmental sustainability and risk to sustainability these are the core criteria on the basis of which this STAR system works.

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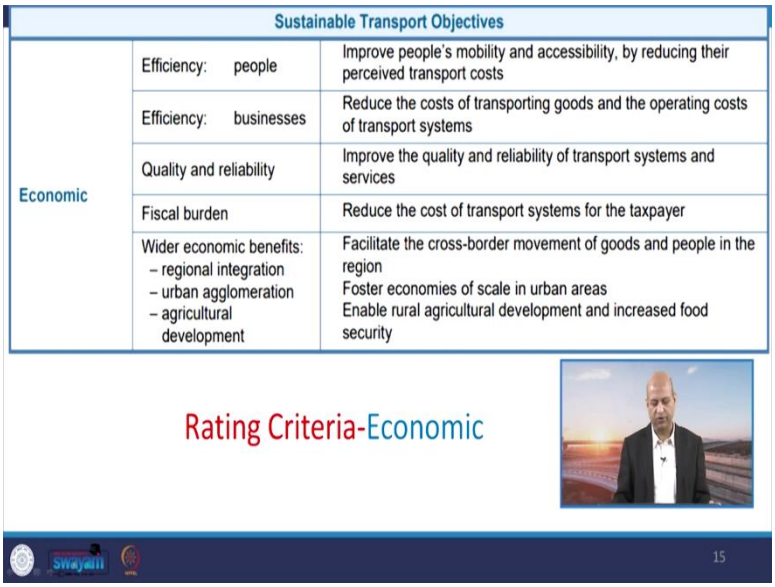

And when we talk about like economic aspects, then we mean basically the efficiency and in terms of improving the mobility of the people and accessibility to different facilities or infrastructure, then it can also reduce the cost of transportation. So, in that way also it should be efficient in commercial way.

Then the quality and reliability and fiscal burden all these aspects are there in terms of economics. So, all these are given here you can see like it should facilitate cross border transport or movement of the goods and services and the people. So, there should not be any problem.

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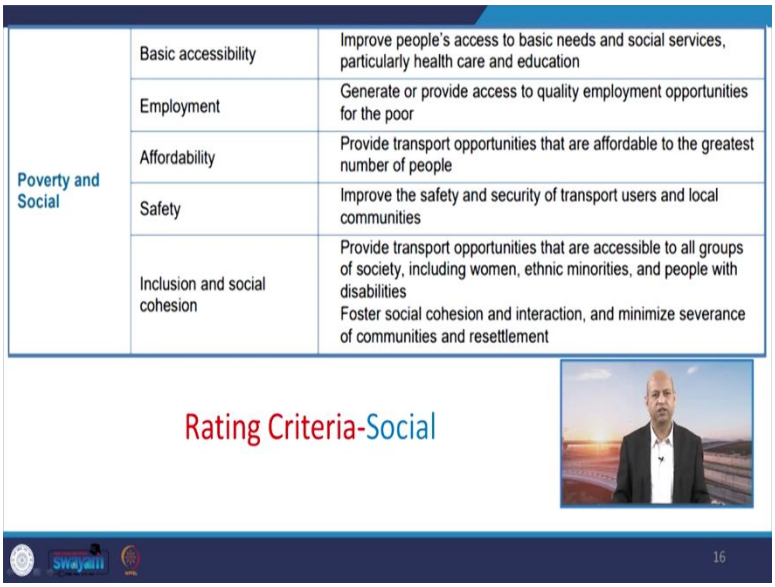

When we talk about like social aspect of the rating criteria, then basically we mean like poverty and social aspects are important and the poverty should be reduced, employment should be generated and affordability means every kind of segment of people they should be able to afford the transportation mode which will be provided in that particular project. Safety issues are there means sometimes road safety issues will be there.

So, for that what provisions will be there so, that accidents may be reduced and other social safety aspects can be enhanced then it should inclusive and the social cohesion kind of things must increase rather than it should not divide people rather it should help people to come together to work for a common cause.

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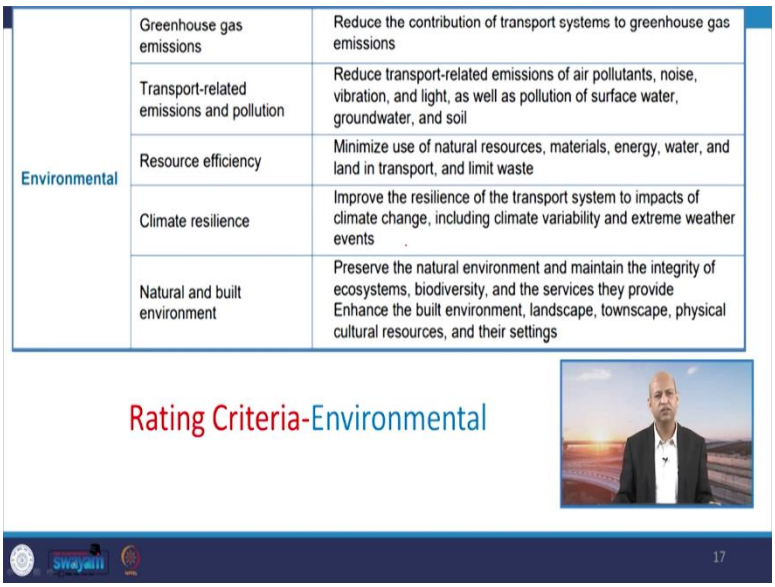

When we talk about environmental aspects of rating criteria, then we basically mean air pollution emissions or greenhouse gas emissions, those kind of. So, can we reduce the contribution of transport systems to greenhouse gas emissions? Can we have those kinds of features into that? Transport related emissions and pollution are also important thing.

So, we can also look into like noise and vibrations, light all those kinds of things which can really disrupt the ecosystem, then resource efficiency that means, it should minimize the usage of the natural resources or these conventional resources and then climate resilience must be there because if it is contributing to climate change, then it is not good. So, whether it should improve the resilience of the transport system?

Which can impact the climate change related these aspects of the resilience. And the natural and built environment all these environment, built environment like urban infrastructure or whatever, we are making those infrastructure and the natural resources, they should be properly addressed and services should be provided it should not go for negative externalities rather, it should go for positive contribution.

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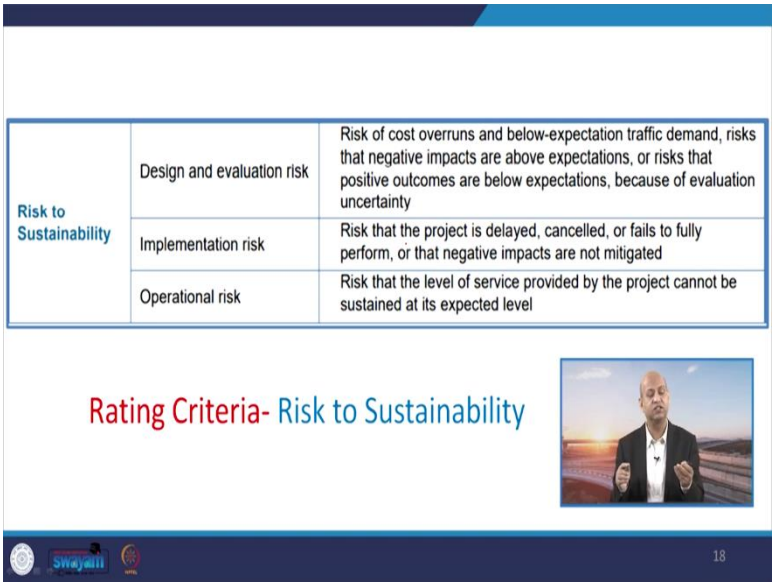

When we talk about risk to sustainability then, three features are there basically like design and evaluation risk may be there because the risk of the cost overrun can be the or if time goes because of several reasons sometimes the acquisition of acquiring land can be a big challenge and then cost increases after some time and then other aspects are also there.

When we talk about implementation of risk, then the risk that project can be delayed or it can be cancelled those kinds of risk can be there. Operational risk maybe also there. So, like level of services provided may not be the expected level. So, those kind of risk are there, uncertainties are there that should be properly addressed.

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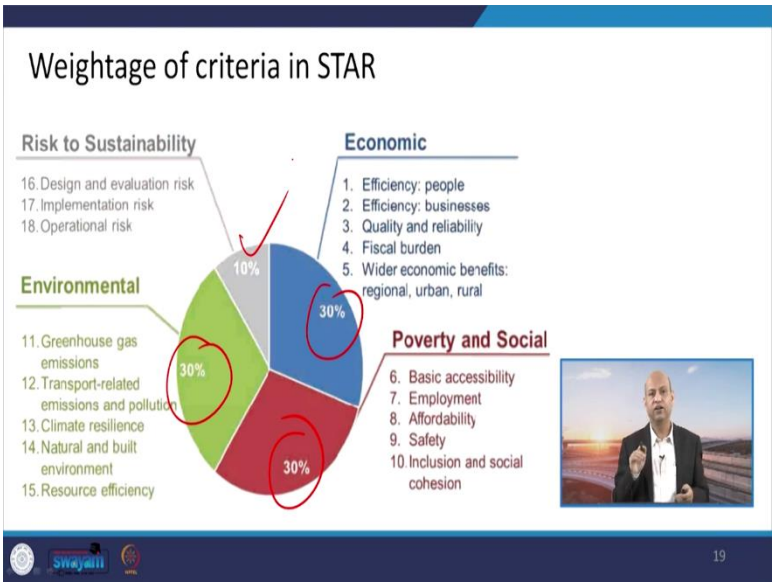

When we talk about the weightage of different criteria like we have discussed about 18 criteria within these four frameworks like economic, poverty and social environmental and risk to sustainability. So, when we talk about economics so 30 %, 30 %, 30 %, economic 30 %, poverty and social 30 %, environmental 30 % and the risk to sustainability is given 10 %. So, total you can see like 30, 30, 30, 90 and 10, 100 %. So, that way this weight is given to different criterion those aspects.

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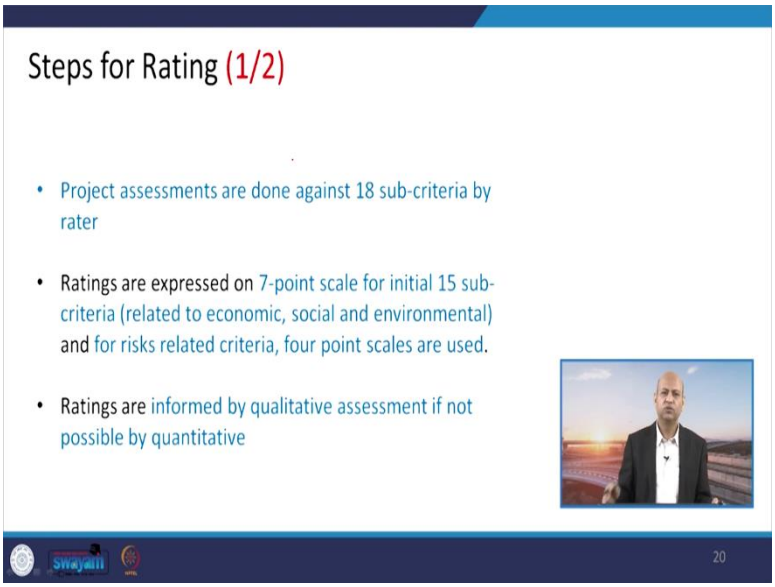

When we talk about like different step. So, for example, when we go for assessment, so, the 18 sub criteria which we have already seen, which are taken into account according to the weights, then ratings are expressed as 7-point scale which we will shortly see what are those 7-point scale and then the 15 sub criteria related to economic, social and environmental aspects can be there and the risk related to those criteria has to be seen within the 4-point scale which we will see.

The 7-point scale for these three criteria of social, environmental and economic and the 4-point criteria is for risk related aspects. When we talk about ratings like so, it should be informed by in a qualitative assessment if not possible, as a quantitative. Though quantitative is favoured or encouraged. But, in case there is a problem for giving some basic quantitative related things to at least qualitative assessment must be there.

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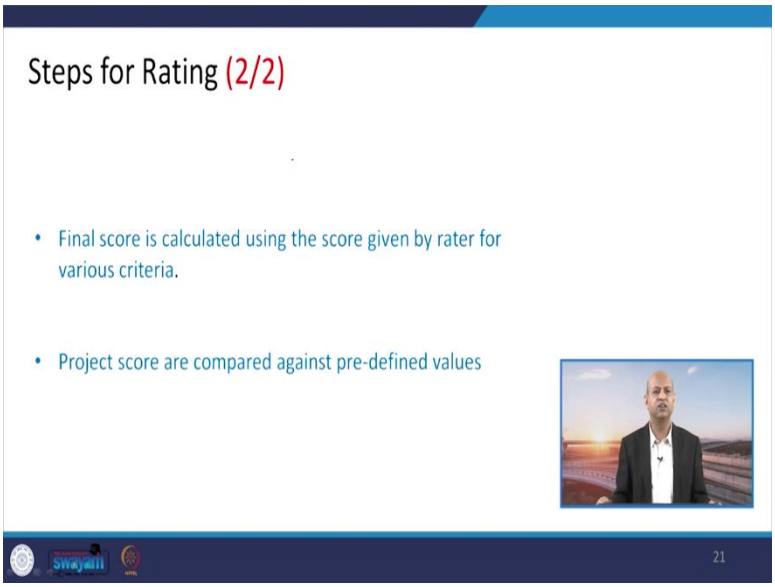

When we go for final score. So, final score is calculated using the score given to all kind of criteria which are we have discussed. Then project is score is compared against the predefined values because those values are there that this is good, this is very good like that. So, in what category it is falling?

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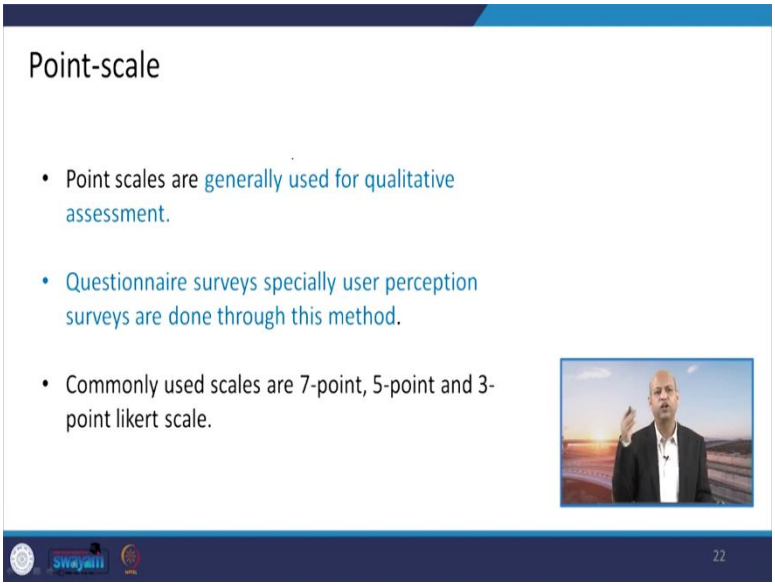

So, that value will give us that kind of aspect. When we talk about point scale, so, it is generally used for qualitative assessment within that range and the questionnaire surveys specially like user perception survey are done through this method and it is commonly used like 7-point, 5-point, 3-point those kinds of things.

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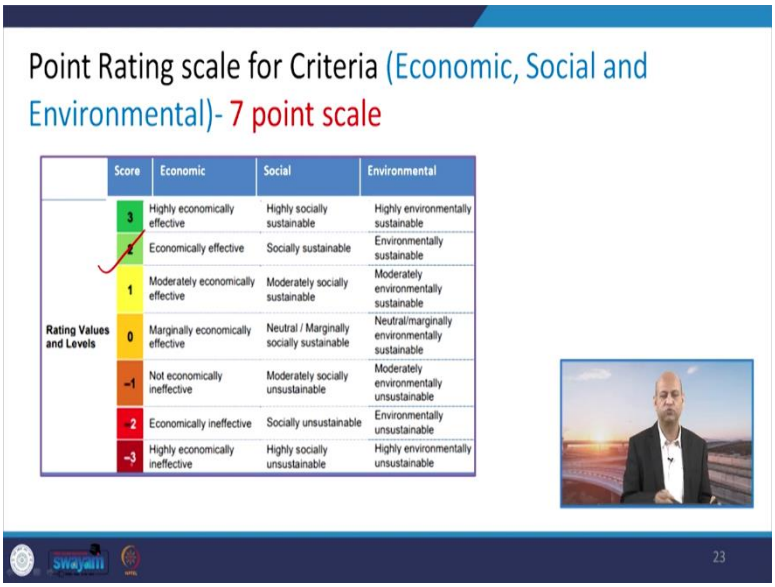

For example, here you can see the 7-point scale for these three major criteria of economic, social and environmental. So, you can see like a score can be 3, 2, 1, 0 - 1, - 2, - 3. So, these are the 7-points. If three score is there so, highly economically effective, highly socially sustainable, highly environmentally sustainable. So, that kind of thing can be in it is given the score three.

When this is lower than that like environmentally sustainable socially sustainable economically effective then we can give the 2 score. Similarly, moderately marginally not economically ineffective or economically ineffective those kinds of things are there, then 0, - 1, - 2, - 3 those kinds of scores can be given.

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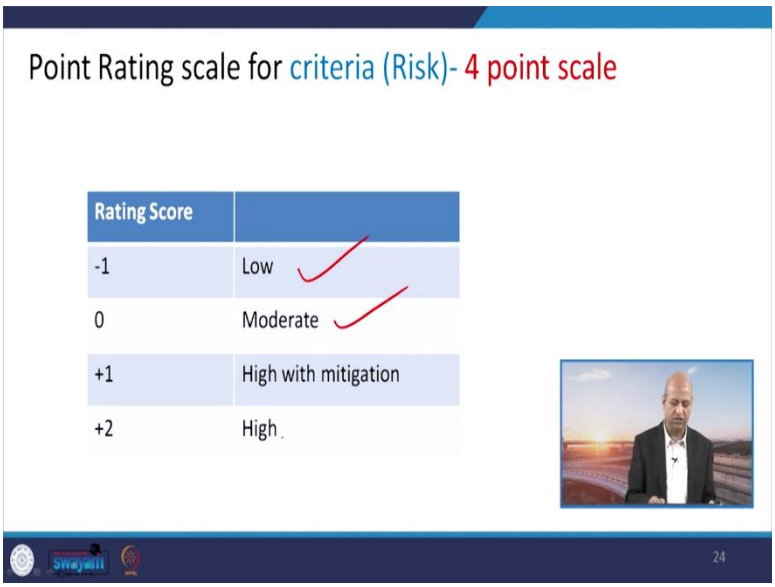

Similarly, when we talk about the 4-point scale, then rating score is like a - 1 that is low 0 moderate and + 1 high with mitigation means if mitigation is done then high can be achieved. And without any mitigation, if it is high, then + 2 is the point scale.

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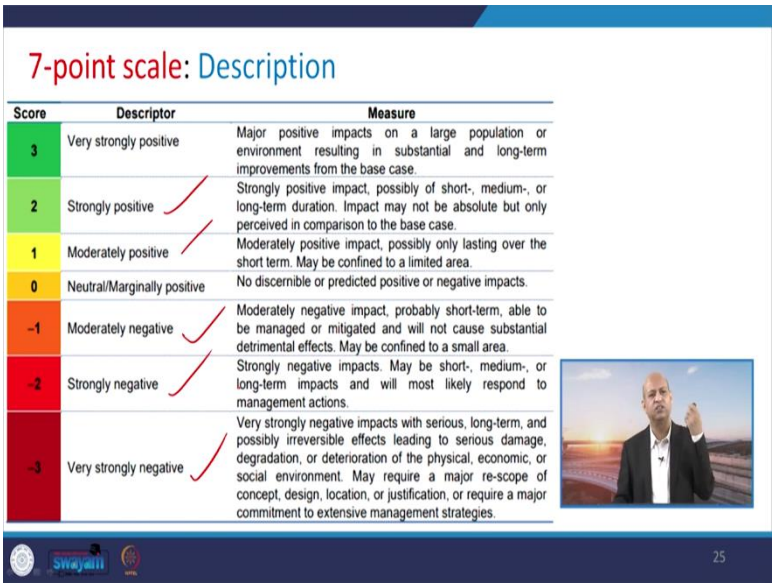

So, when we talk about these 7-point scale. So, different descriptors are there like very strongly positive, strongly positive, moderately positive, neutral, marginally positive or moderately negative, strongly negative, very strongly negative. So, according to those features description is given here you can see like very strongly means major positive impacts are there on a large population and environment and resulting in a substantial and long-term improvement from the base case.

So base case scenario is there. So that a lot of improvements will be there. So, we can call it very strongly positive. So similarly, things go down then strongly then moderately those kinds of things are there.

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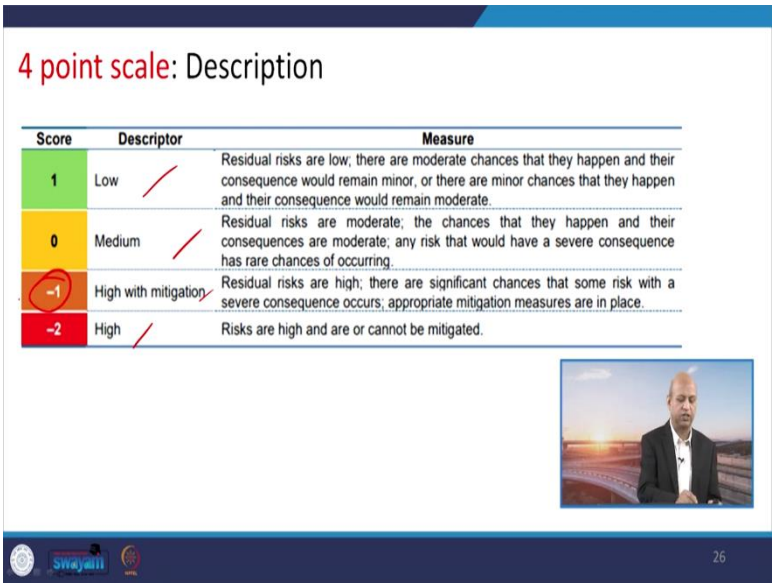

In that similar way, this 4-point scale can be there. So, low, medium, high with mitigation and high, these are there. So, when we talk about low that means the residual risks are low and there are moderate chances that are that they happen and their consequences would remain minor. So, that means low risk is there. And very high risk means which cannot be mitigated, if it can be mitigated, mitigated then - 1 can be there. So, those kinds of scoring we can see.

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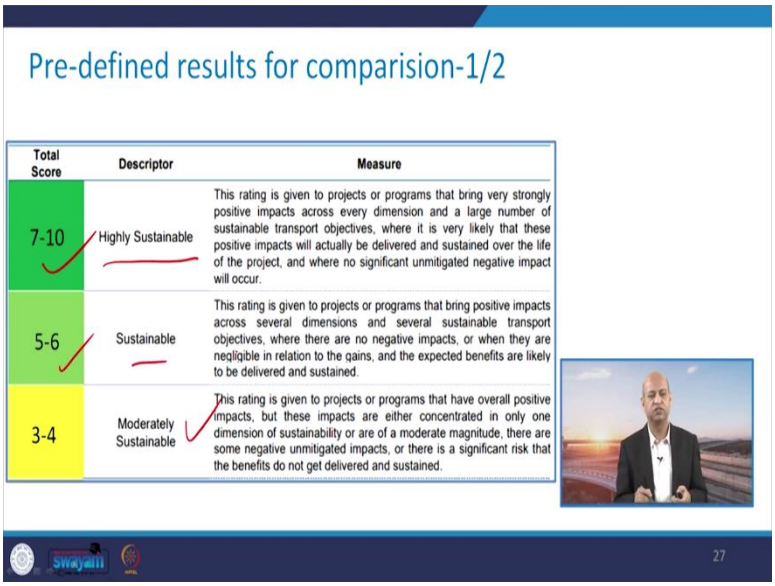

Predefined results for comparison, when we will do the scoring as for those 7-points or 4-point scales, we will total it and then we will compare with the predefined results for the comparisons. So, this is like 7 to 10 total score and descriptor is highly sustainable, 5 to 6 sustainable, 3 to 4 moderately sustainable. So, the description is given this table.

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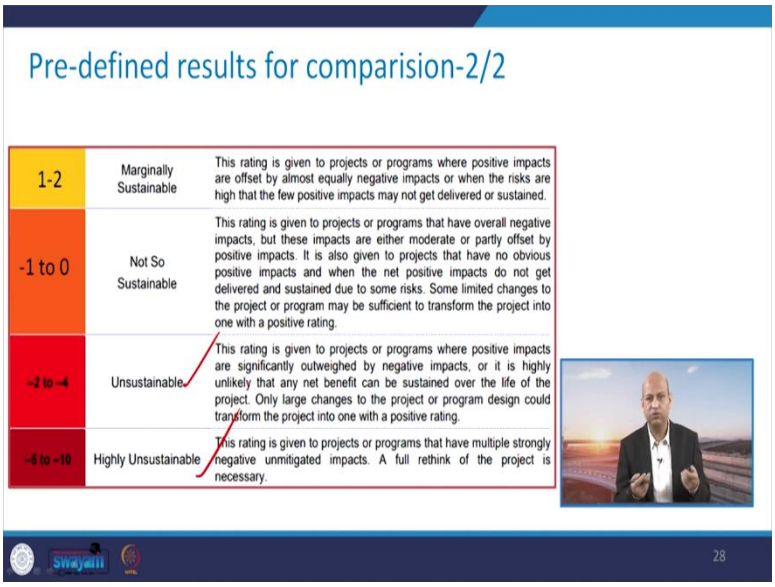

Similarly, 1, 2, - 1 to 0, - 2 to - 4, - 5 to - 10. So, marginally not so sustainable, unsustainable, highly unsustainable. So, those scoring will give us idea with this table with this predefined value that the project is sustainable or not. Can we do something to make it more sustainable those kinds of things can be taken here.

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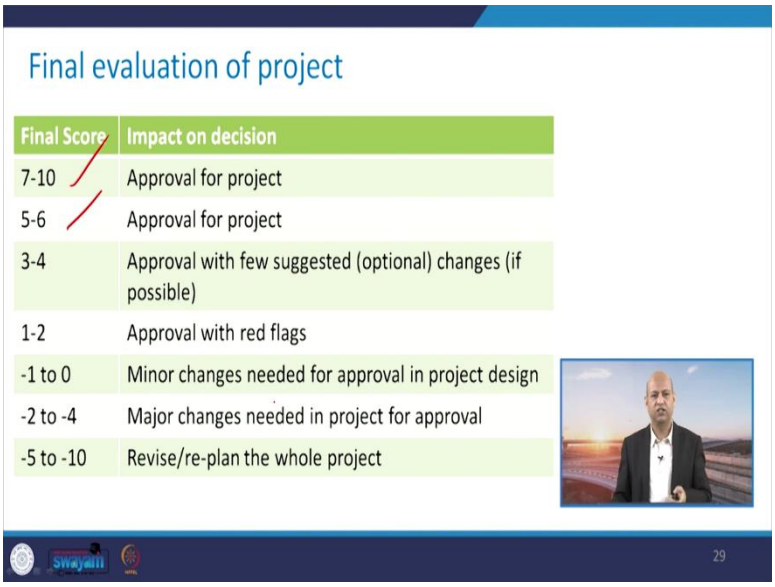

So, final evaluation basically. When the final score is like 7 to 10, 5 to 6 then it is approved basically, projects are approved and 7 to 10 is very good, 5 to 6 is okay, 3 to 4 approved but some suggestions are given. So, some changes may be optional and 1 to 2 score is there then approved but with red flags means some critical suggestions will be made and if those solutions are not implemented then problem may be there.

Similarly, - 1 to 0 is there then minor changes needed for approval in the project design. Then - 2 to - 4 that means major changes would be required otherwise project will not be approved. - 5 to - 10 that means, the project is almost rejected it has to be re submitted after the revision.

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So, now, we go for a hypothetical case study so, that you can appreciate how this ranking system works and how decisions are made based on that. So, we assumed that there is the x, y, z country and road development project is there and they want to get the loan from ADB. So, these are the features like it is densely populated lower middle-class country and it lacks road connectivity for villages, which keeps a large population deprived of socio-economic opportunities. So, that is big issue then 15000 villages need rural road connectivity those kind of assumptions we have made.

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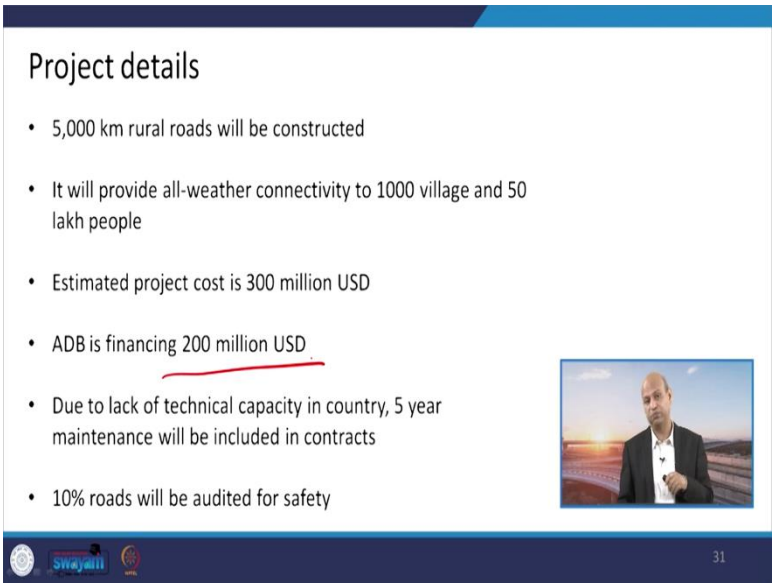

5000-kilometre rural roads will be constructed. So, this is part of this particular case study it will provide all-weather connectivity to 1000 villages and 50 lakh people. So, even if it is rainy season that connectivity will be there. Then estimated project cost is around 300 million US dollar and the loan which is assistance financial assistance requested to ADB is around 200 million.

So, 100 million USD will be mobilized by the country itself then due to lack of technical capacity in country 5-year maintenance will be included in the contract so, that it can be maintained properly operated properly and 10 % roads will be audited for safety purpose randomly.

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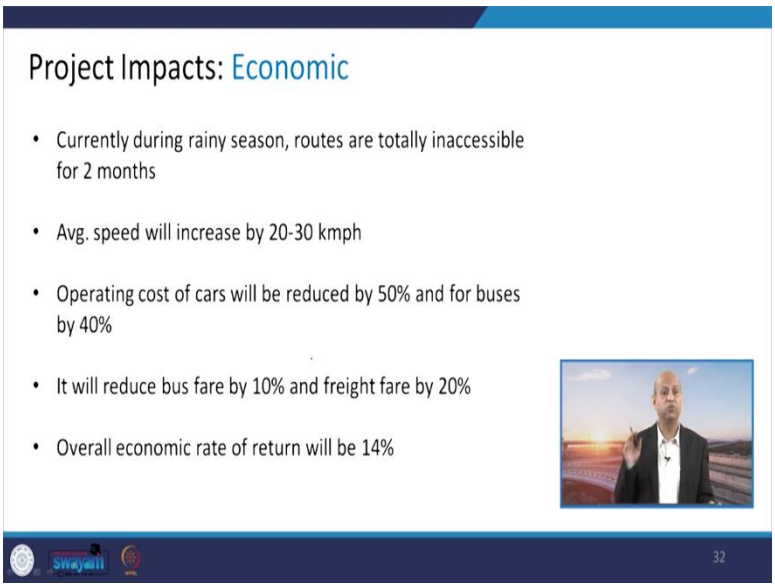

Then the impacts like economic impacts. So, currently during rainy season routes are totally disconnected inaccessible for two months. So, that will be read off after having this project average speed will increase by 20 to 30 kilometre per hour. Then operating cost of cars will be reduced by 50 % and for buses this will be reduced by 40 %. Because roads will be better, speed will be better, fuel consumption will be low like that.

It will reduce bus fare by 10 % and freight fare by 20 %. So, a lot of economic benefits are assumed overall economic rate of return will be around 14 % that is a good figure.

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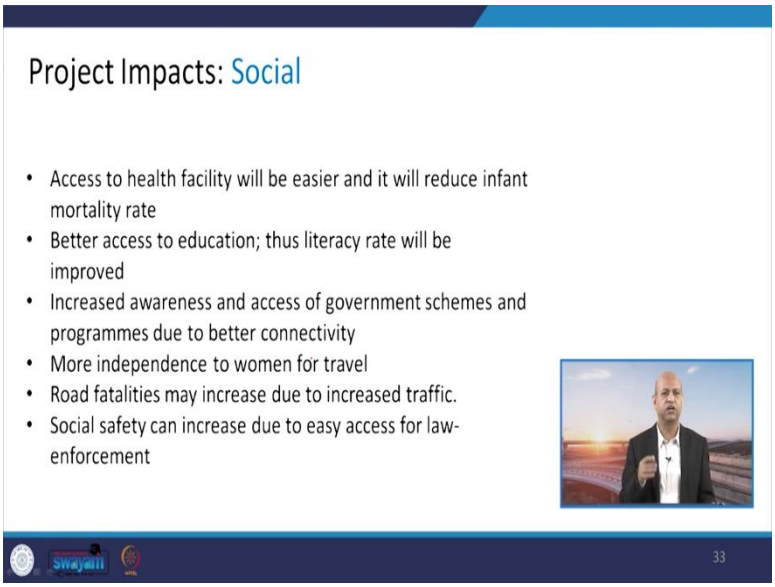

Social aspects project impacts will be like access to health facilities, educational facilities better connectivity for different kinds of activities, more independence for females they can travel safely. Then there will be some road fatalities but it can be addressed properly with safety measures.

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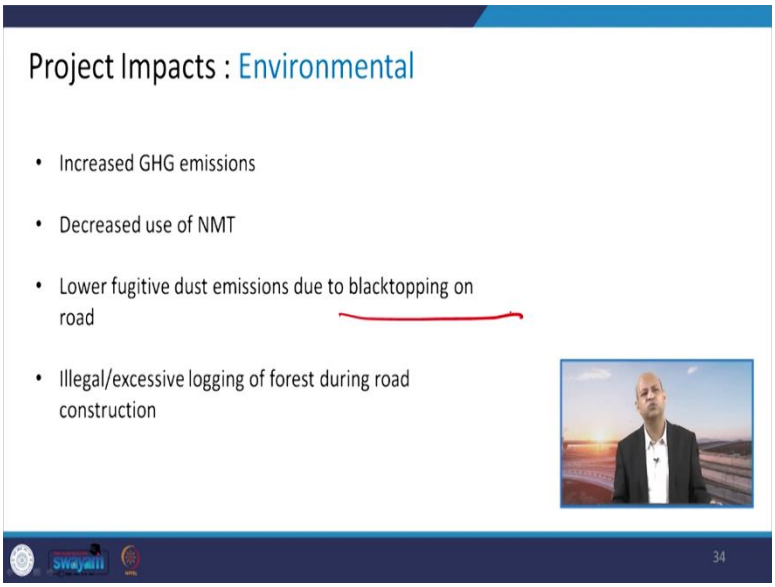

When we talk about environmental impact then of course there may be greenhouse gas emissions increase and then decrease of the non-motorized transport system maybe there which are good in terms of the environmental impacts, but it will be decreased so that will be issue but his speed will be more so time will be saved.

Then lower fugitive dust emissions due to this black, this blacktopping on the road otherwise if it is met, it is a dusty road then lot of fugitive emissions happens and a lot of dust pollution episode that will be gone with these projects. But there will be is like some issues like illegal excessive cutting of the forest when these activities happen then some those kind of issues also happen.

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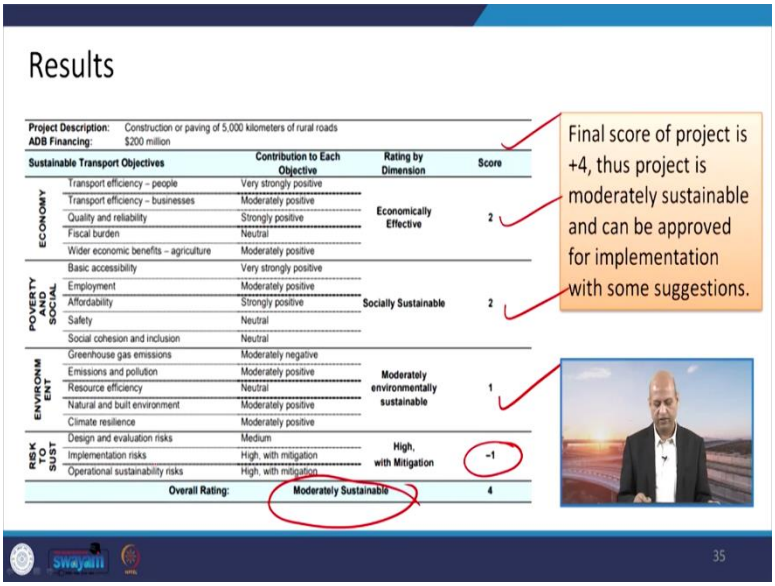

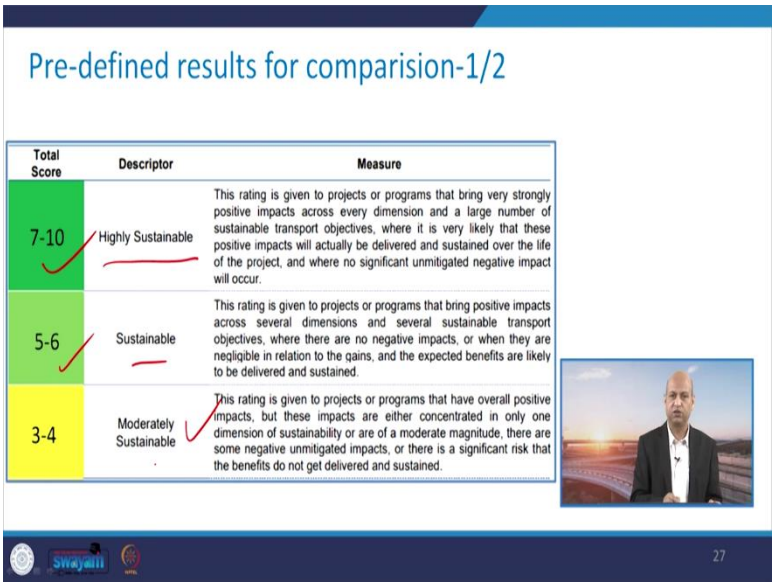

So, results are there because we have seen all these aspects and according to all these economic poverty risk all these aspects, we have given them a scoring based on the expertise available. So, the 2 for economic effectiveness, socially sustainability it is 2, moderately environmentally sustainable because there are issues like emissions of greenhouse gases etc. So, 1 score is given.

Then risk is related to like high with mitigation, so, - 1 is given and when we see then total this rating is around 4. So, this is a moderately sustainable because you can see here 3 to 4. So, moderately sustainable So, with these predefined results, we can see that this particular project is moderately sustainable.

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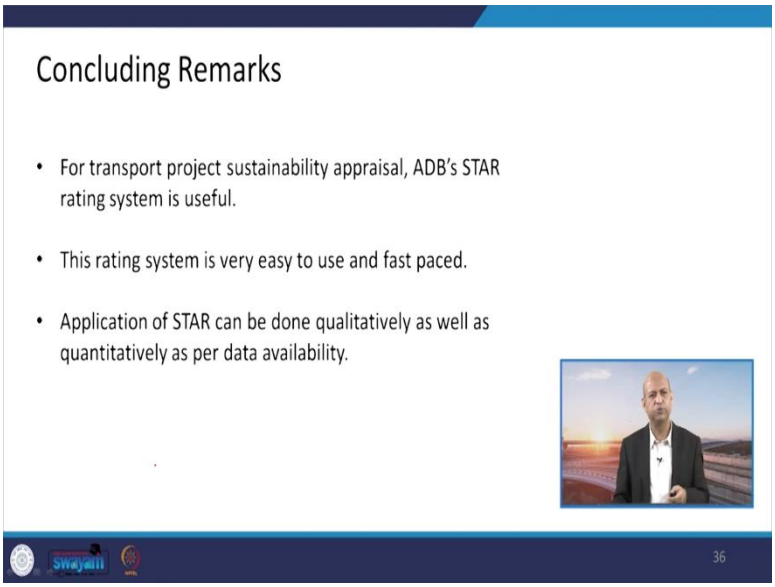

So, we can say that this STAR rating is very easy to use and it can help in making the fast decisions and the project can be seen whether it is sustainable or not. And accordingly, suggestions may be made if there are some issues.

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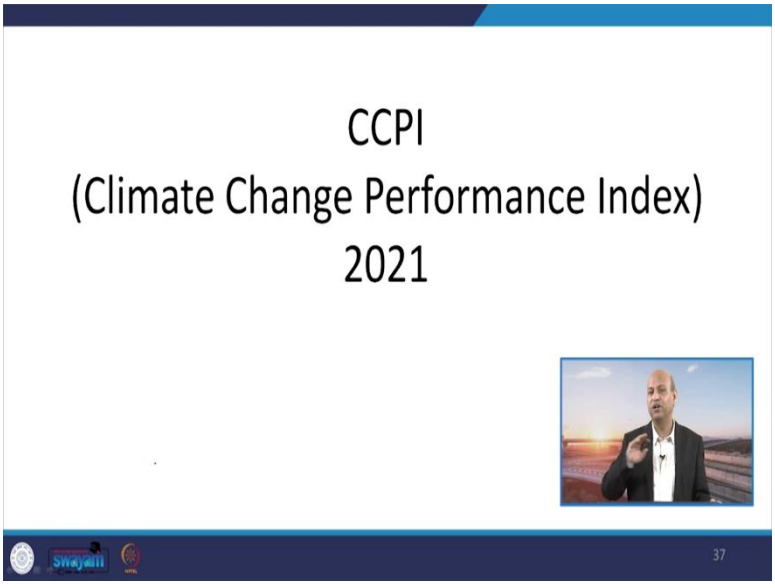

Now, we talk about like climate change performance index of 2021. So, that is another index which can give complete different insight you will see very interesting data is there.

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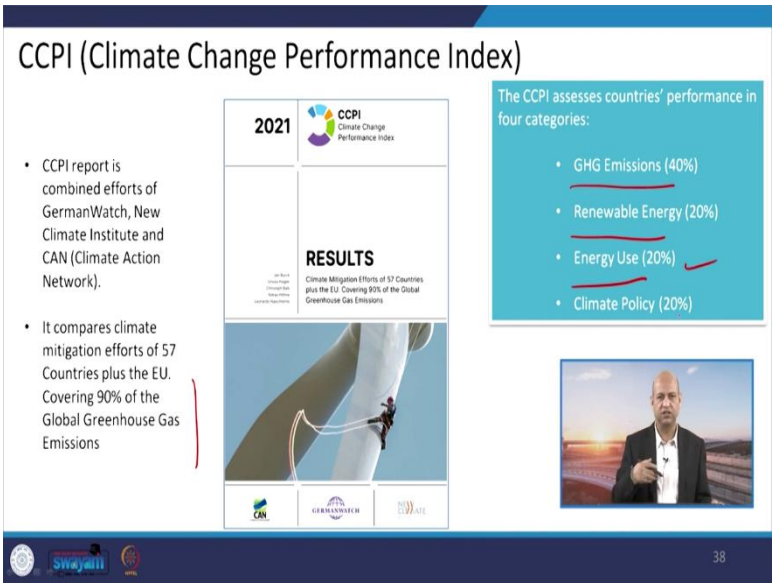

You can see this particular report is combined efforts of GermanWatch and New Climate Institute and Climate Action Network. And it compares climate mitigation efforts of 57 countries plus the European Union and it covers around 90 % of the global greenhouse gas emissions and because those countries are making a lot of emissions and the CCPI these climate change performance index basically have four categories, greenhouse gas emissions 40 %, renewable energy 20 %, energy is 20 %, climate policy 20 % So, that way the 100 % is there.

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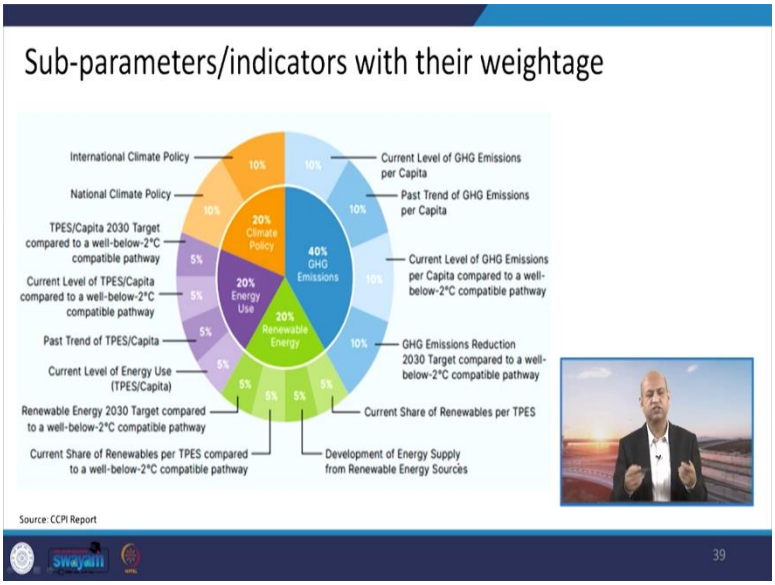

And we can see within, that bigger category like greenhouse gas emissions, so, then 10, 10, 10, 40 and this 10. So, like current level of greenhouse gases emissions are there per capita,

past trends of the greenhouse gases. So, that distribution is there to give the scoring or ranking and GHG emission reduction by 20, 30 target compared to a well below 2 degree this compatibility there.

Then if you talk about renewable energy, so, there are another segments like current share of renewable energy per TPES, development of energy supply, So, that way you can see there are subcategories, which can help in having the ranking.

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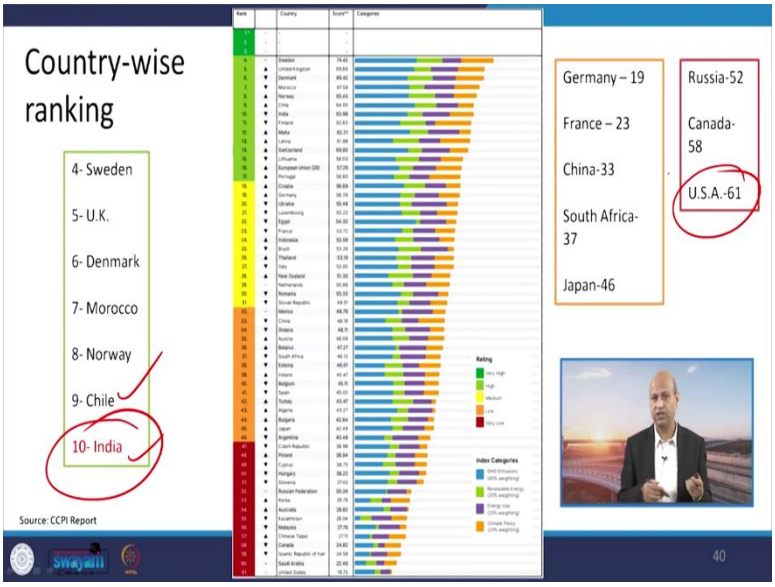

So, country wise ranking you can see there are not top three countries because the whatever the cut-off was related, so that means no country's making good score in that way. So, the fourth number is Sweden and India is having the 10. So, in top 10, India is there if we talk about this CCPI rated index. Wherever there are so, many countries so called developed countries like Germany, France, China, Japan, they are not feeling out in that way.

So, from climate change performance perspective results are quite interesting. So, that means, this Chile, Norway, Morocco, India these are developing countries, but they are making very good progress and in that way they are at the top 10. USA at 61 in that way, that means, their economy is very highly energy intensive and their efforts in that direction to mitigate climate change may not be so, good as other countries are making.

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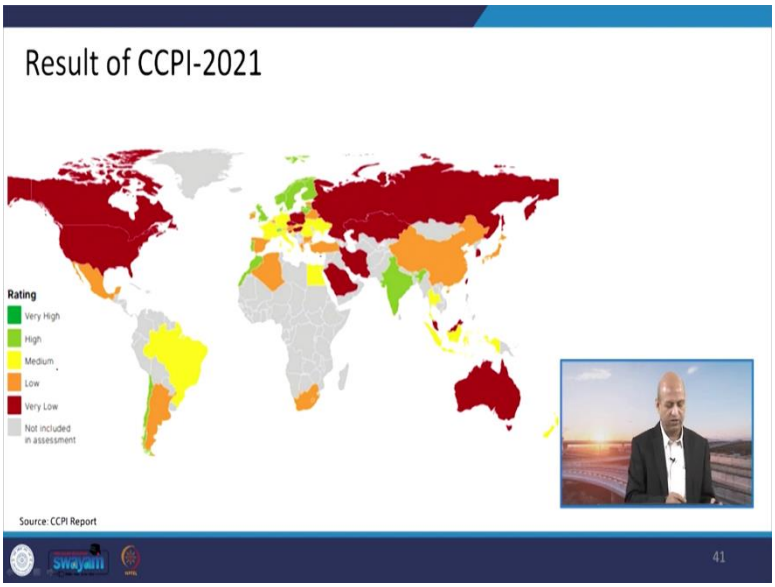

When we see in colour scheme. So, green colour, so, very high rating, the green colour related areas, and then high is there and medium, these yellow and the low those kind of figures you can see.

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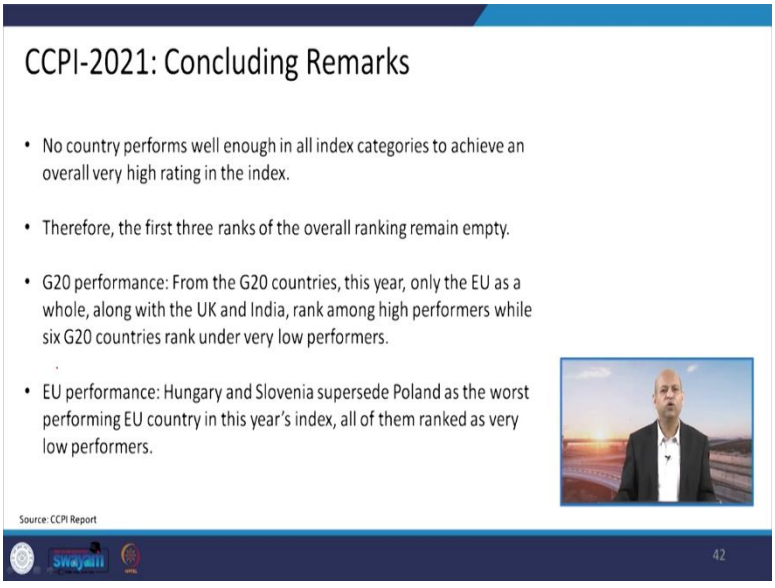

Well, so, in conclusion, we can say that there is no country at present which can perform, which can perform well enough in all index categories to achieve an overall very high rating in the index. So that is why the first three ranks of the overall ranking remain empty only from fourth like Sweden, it starts with. G20 performance basically from the G20 countries if you see, so this year, only the EU as a whole along with the United Kingdom and India.

They are ranking among high performance, while 620 G20 countries they rank very low performance as very low performance. And when we talk about EU performance, then Hungary and Slovenia supersedes Poland as the worst performing EU country in this year's particular index. And all of them ranked as very low performance. So very insightful assessment is there and these European countries have to make a lot of efforts to come up in that particular index.

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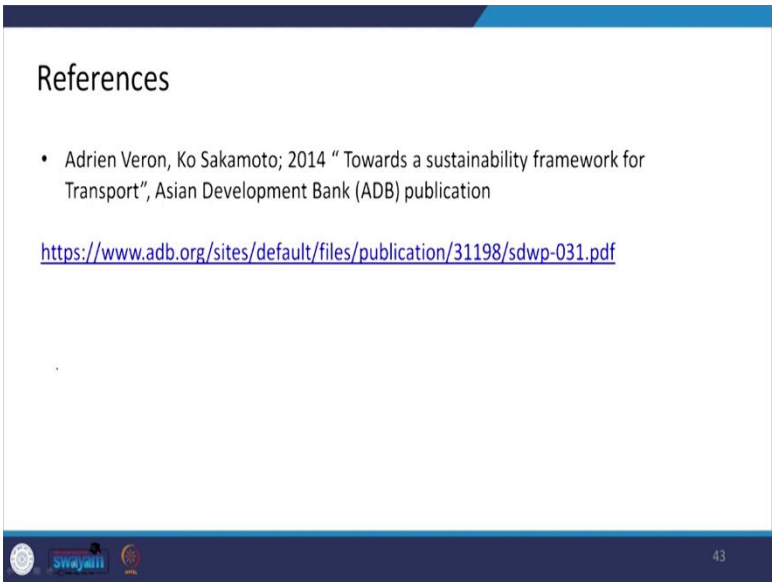

So, this is all for today and this is the reference where we have taken this particular sustainability framework of STAR rating system. So, you can go through it in detail if you want. So, thank you for your kind attention, and see you next time. Thanks a lot.