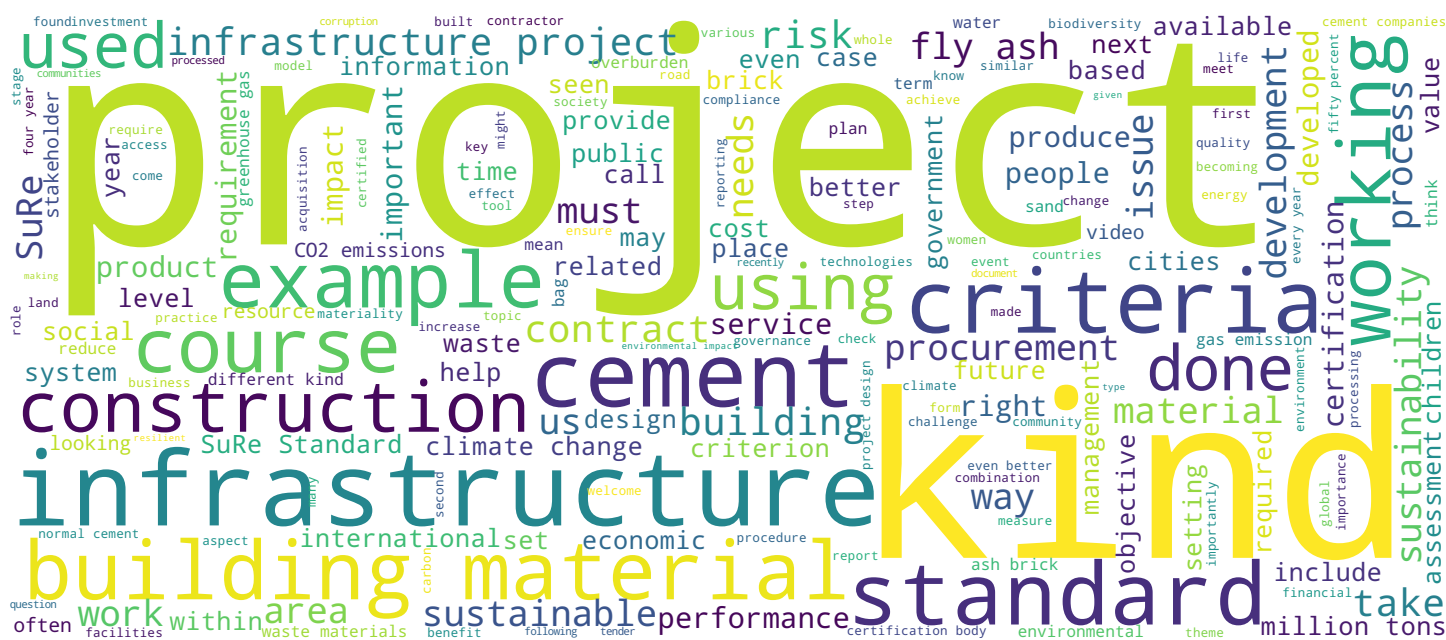


Building expertise on sustainable and resilient infrastructure

Louis Downing



Introduction



Climate change mitigation and adaptations are topics which are often missed in infrastructure project design but there are many things that infrastructure projects can do to reduce their greenhouse gas emissions and to make sure that they are resilient to the shocks and stresses of the future. In this video, we will explore one example of a project design improvement that could greatly reduce greenhouse gas emissions in many many infrastructure projects. It is strong gray and responsible for about five percent of the world's man-made CO2 emissions. Can you guess what it is? Cement. We recently hosted an event in Delhi where we asked a prominent professor, what he is working on to reduce the CO2 emissions from cement. In the next video, Professor Soumen Maity from the research organization development alternatives, tells us about alternatives to conventional Portland cement and some other interesting initiatives which could reduce the environmental impacts caused by building materials. (inaudible) and thanks for setting the tone of this workshop also and some of the examples that you gave also probably I will try to find out some solutions but I will not say that these are the only services at the end.

Notes

Summary



0m 05s



Development alternatives, this is the building that you are sitting in and this has been developed from waste materials; for the building materials that you see here, there was a previously building here made of mud. We have brought it down and just processed it and made bricks out of it so these are the kind of building and this building has been averted the most energy-efficient building around five years. So you see, my most welcome to go around the building and see what a different kind of materials or different kind of construction techniques that has been used. We do, we are a not-for-profit called we call it a corporation because we are in corporate of lot of farther smaller companies also and our main area is doing research developing new kind of materials, you have kind of processes technologies and then looking at but all of these looks at how to the work from the climate perspective and broke from the resource in the social perspective of us. Of course, we are there in 1993.

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1m 33s



In material research and development we do a lot of research put on the materials of the building looking from the walling materials floating and the roofing materials to also infrastructure materials but totally of the materials on the way that you use these materials because what we feel is that yes that is one of the area of research that needs to be done and some new kinds of technologies that needs to be practiced in and not only on the way that you use those products but to make that you produce those products also and all of these if you think will look at these from four different angles. It must be resource efficient that means it must use, it should not use the working source materials or raw materials that are ever around the earth; it should be of course, look at crime in climbing friendliness, it should not emit high amount of carbon emissions and most importantly it should improve the efficiency of the processes and of course it should create both jobs him probably killing orbitals. So with these let me take you through three different kinds of approaches that we have developed, these are when applicable to your place also but there are other kind of technologies which we might be taking, taking up in one-to-one discussions.

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2m 35s





Construction and demolition waste is of course in the cities. This is becoming a later kind of an issue now and we had done two years ago, we had done a study around minister of environmental forest and VG Issac and found did an extrapolation study of around ten cities and from there we calculated that yes India produces roughly around seven hundred and sixteen million tons of construction and demolition waste, per year. This is four year; we have only second to check. Now what do we do about it? so this is well, if I put it with the present housing shortage of would take me and pointed out and the urban housing demand fifty million then these kind of, we are going to move from this kind of blesses to the pictures that you see in the back, where everybody aspires to be well went to deep well defined houses and in this process we produce these are the kind of needs. So we are working and we have both with commendable Municipal Corporation, a utilizing designing the distribution and the management systems of the sea anyways and then setting up not setting up, It was set up but giving them technical support with an enterprise with a commercial company for Ahmedabad Enviro Projects Private Limited utilizing the same anyways in various other forms, you take the waste and there are various of the methods of processing it, processing and producing building materials out of it.

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3m 54s



These building materials are commonly used in building materials making blocks or else you can use any other things, even you can use these in structural complete up to our body factors not notice that right now because then the strength there is an issue of the strength but with these kind of building materials which are non-structural products, you can use it in even and don't you be medium duty heavy duty inroads in everywhere you can use this, even in your construction projects and all of these materials, when you use that on ninety percent of the waste materials; the products that we make that are not the take personally because the 10 percent of cement and other additives that we use and we have done a life style analysis of this products which saves around fifteen to twenty percent of co2. These are most importantly, these are not costly, these are even take to fifty percent cheaper than the normal the kind of blocks or that kind of building material steps and these are being certified. We have got them certified by the Vedas so that you can if you are using this infrastructure on project, you can get additional benefits of rupees.

Notes

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5m 29s



In the brick sector everybody knows about fly ash but yet we are producing around hundreds and eighty million tons of fly's every day, every year, every year and if I relate it to the bricks in India producers requires around 320 completely brilliant prints a year, we consume and out of them 80% is regulates then brick means which is used by the normally the topsoil not a little soil that you see and of course we are the again we are the second largest producer of bricks or user of building materials compared to China. Now if we are, there has been and we are doing a study on the primitive result see that if you are using top soil in making this kind of bricks then sooner or later was not in the next 15 to 20 years but in the next 15 to some kind of makes five or six decades mean there will be effect on footprint production of us because we are at mainly an agriculture-based economy so and with this we have fly ash available with us and at present only other 50% of the fly ash is being used by this event or other industries but we are still about 90 million tons live.

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we can very well use this in making building materials, daily materials make brick which is of course in people say that when flying ash bricks are not a good quality but you can make this of acceptable quality as per the local standards or as per IS standards also and these use around 90 to 95 percent of waste recycling. You don't previously people will be using fly ash brick with sands and now there are technologies available and we have lots of other enterprises and you can be heard in other states. When you use flyers along with stone. Fly ash along with books, bottom ash anything other than sand because sand is now everybody knows this and is becoming a huge amount of issue, a problem is this. Even in the previous life that has showed with the CNT waste the final fraction, the final fraction is lesser than 2mm or even between 2 to 3 mm you can easily replace intersect in either districts or any other kind of building materials or construction and these are absolutely zero. It doesn't produce or any little bit of carbon from the motors and others but that is negligible and of course these are affordable you see this building in the outside of this building inside outside of the building that we have in this we have all used fly ash wings.

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7m 58s





So even people do have an idea that well fly ash bricks are not good enough but you can make multi-story, even lots of other buildings. The latest a kind of work which I have specially selected it's because this is related to the cities that were working on and we are now working with the Raj for whoever told and has made these are some facilities when you produce usually about the founders language this language are not thrown them these are not no use and in India he produces something around 1 million tons of this kind of base. These kinds of ways can easily be turned and processed into again into these are the kind of building materials and these are not very large-scale enterprises industries but these are small to medium scale enterprises where you can create jobs also. Jobs enterprises and entrepreneurs people can set up this kind of small units and supplies and these are some of the roads that has been built also with these and this is rural road ,a this is a given an island you know you can trucks and other things and moving and this user 90 percent of waste and of course zero emissions now and right now the city's data shown you we have been using these working with the cities and municipalities in utilizing this waste and recently we have declared that is one of the fabulous clusters needed of daily has a 100 percent waste we see.

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waste 3.. cluster The next is of course the cement, cement you know infrastructure industry you will use cement we have developed a look, this is a project along with EPFL in Switzerland ETH in Zurich and with three Indian Disturb sign in addition of Technology IITs in Madras Bombay hands mainly. This is a joint project for the last four years where we have development cement with teachers out of 45% of waste materials with these materials are else in place which is overburden is a not normal place that you use but overburden that you have in China to advance and we have seen that previously people thought that well clay is not available but we have found and study that you have around china clay underneath 22 states, all their own waste, these are not being used preferably any ceramic or other refractory purposes but these are simply lying as based and appeared as overburdens and these are limestone which is non-cement great limestone which are not being used presently, these are left by the cement companies and these are the values that are filled so you can use this cement and produce a concrete or a similar, use these materials in the cement and you have produces the cement which is of general purpose use.

Notes

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10m 56s





It reduces around 30 percent of co2 emissions and what we are now doing is we are now submitted the standards to the VIS because without the standard you cannot produce the cement and but but we can use what we call it as a combination of gas and clay, Keelson clear limestone from this companies have started producing it and right now what they are doing is in a concrete, concrete on building materials in the end of the performances is in the standard is the performance with standards. So there are NC units are we'll be using this mix of Gilson player limestone and gypsum and instead of producing concrete with two packs of or one two bag of OPC they are using one bag of OPC and one bag of this because this is the fifty-fifty percent means. So this is and these are all general purpose cements. We have done an extensive study along with deities in doing all the quondam durability tests strength tests and what we have seen is that these are durability it doesn't affect and it is even better than normal balance cement and these are the kind of cement industries that have been used in producing.. Absolutely the same, same as normal cement normal cement means OPC, even it is better than BBC.

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12m 20s





yeah you can use it that is that is general generally that normal it gives you the sense. The combination and the chloride ingress are even better than this kind of cement, so that you can use these in very application pores bridges and other areas also. And what about cost? Cost, we say it is around 50% cheaper than the normal-cement but that is to the cement companies to decide whether they will be money extending that cost money that cheaper cheapness into the customers or their will to give that profit within themselves. With this kind of cement, it can be we have used it in houses, we have used in industrial scale productions also and recently these are the prefab different structures in fully automated plant that are using a high-impedance. For the cement? It is more or less same, if there is no change in the; we have tested it in, we cannot attest it in long terms of fifty years or hundred years but we have done some accelerated tests at IT Madras. The life of these is equivalent in some cases it is even better because if you see the cement, the cement is fine pint cement so there is a lot of the corrosive is reduced.

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13m 52s



so your interest even your chloride attack or your population tips for your compete is much lesser than this so and these are some of the construction techniques that are there of course but that is not only about the construction millimeters but the ways that you do construction and this is the last that we are think that you should be working with this area. This presently Jacob Laxmi is manufacturing so it will be available I think presently they are making it available from the in the Delhi Mumbai that corridor but we are in dialogue there are certain other cement companies that have expressed interest in working in producing this in southern India it is Heidelberg cements and yeah I hide resilience and in Northeast we are working with dalmiya, dalmiya pallet. Tt produces this in northern North East region and in central region probably we will be working with prison cement but whole thing SCC and kombucha they are also under deck is not yet interested in looking at it because they are interested in doing acquisition of civil companies but whole is improve? Yes.

Notes

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15m 13s

