

System Design for Sustainability
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Week – 07
Lecture - 01

Sustainable Product-Service System Design – Methods and Tools

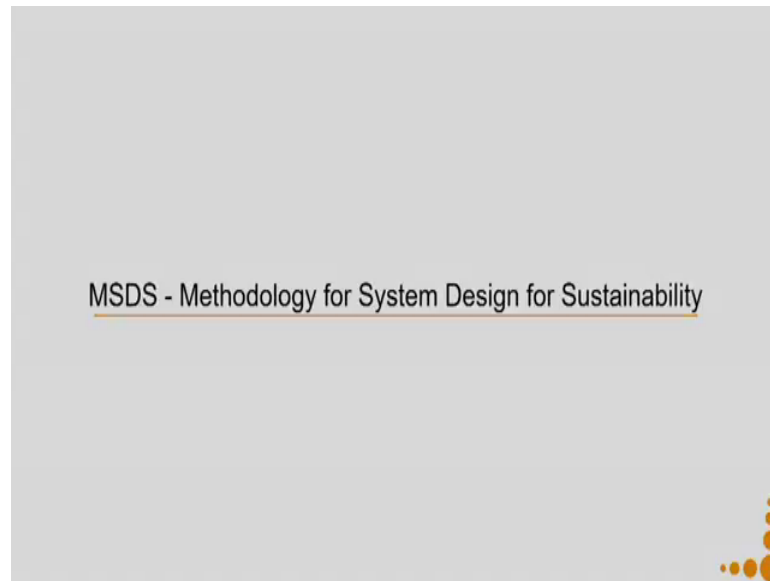
Welcome to this week's lecture. So, we will go ahead with our strategic analysis.

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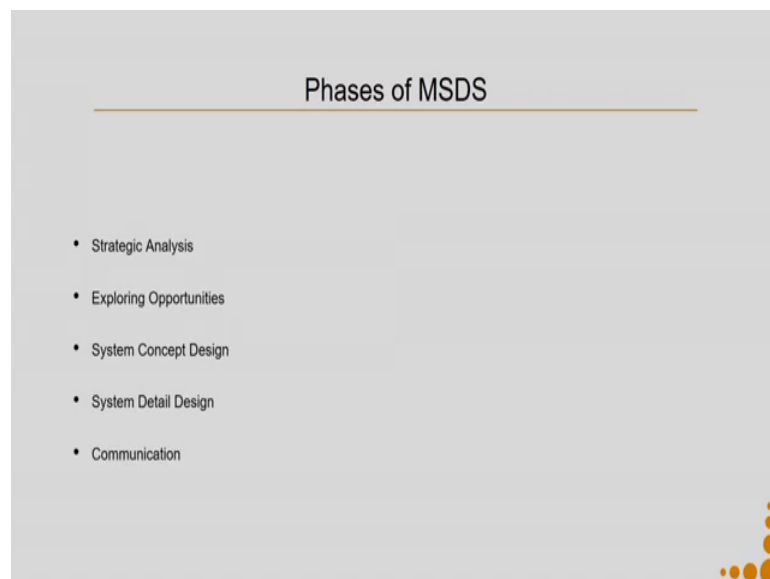


So, in our previous week we were discussing about strategic analysis, when there is one the stake holder is a promoter who comes up with a requirement for an SPSS development. Today we will discuss about the strategic analysis, when no one stakeholder can be identified as the primary stakeholder, that is it is a multi stakeholder system and we call this as a socio economic ecosystem.

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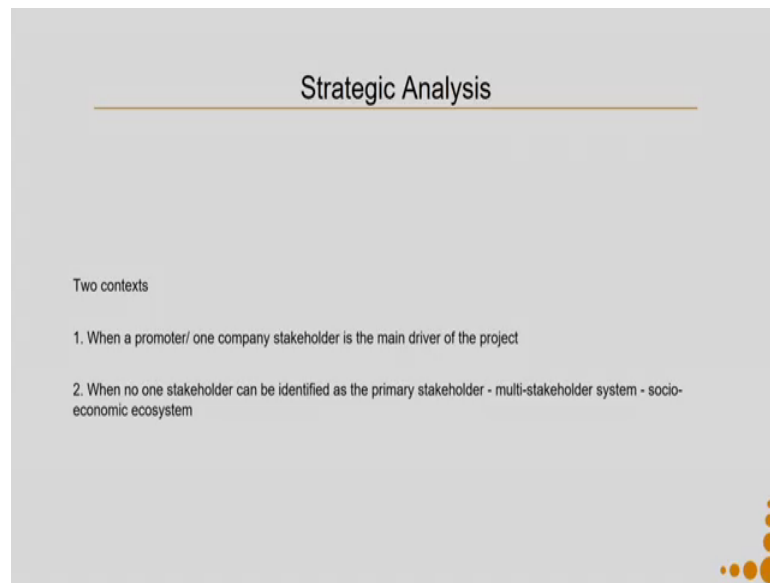


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So, a quick recap of the phases of the methodology for sustainable Methodology for System Design for Sustainability MSDS. So, the stages of MSDS are first strategic analysis, then we explore opportunities, then we do system concept design, then we do system detail design and communication.

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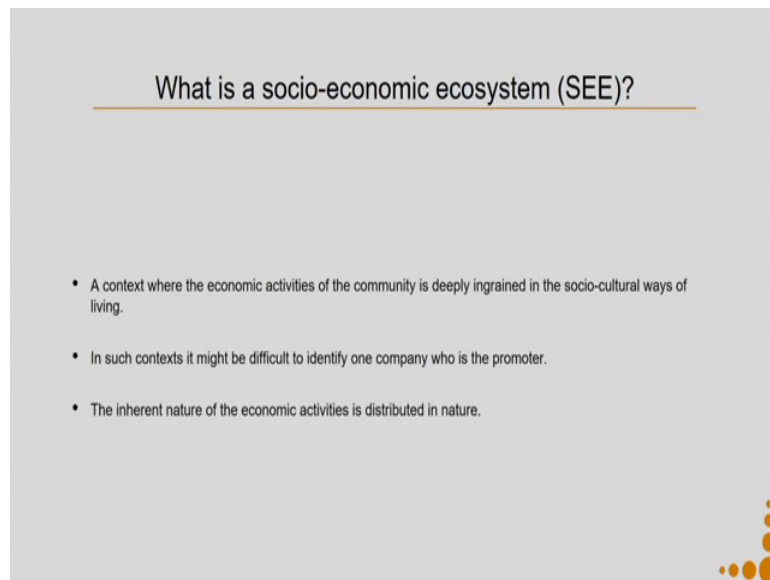


In strategic analysis as we discussed there are two context when a promoter or one company or stakeholder is the main driver of the project, and when no one stakeholder can be identified as the primary stakeholder or a multi stakeholder system or a socio economic ecosystem. So, let us first try to understand what is socio economic ecosystem is.

So, we will go through the definition and then we will go through an example to understand what it is. So, a context where the economic activities of the community is deeply ingrained in the socio cultural ways of living so, say for example, craft sector or the handloom sector. The economic activity is deeply ingrained in the communities socio cultural ways of living is just not an economic activity, all of us engaged in certain kind of economic activities, but that is not in grain in my communities socio cultural ways of living. In this particular context it is ingrained in a socio cultural ways of living.

In such context it may be difficult to identify one company who is the promoter, the inherent nature of the economic activities is distributed in nature, what does this mean that there is no one central hub for doing these economic activities.

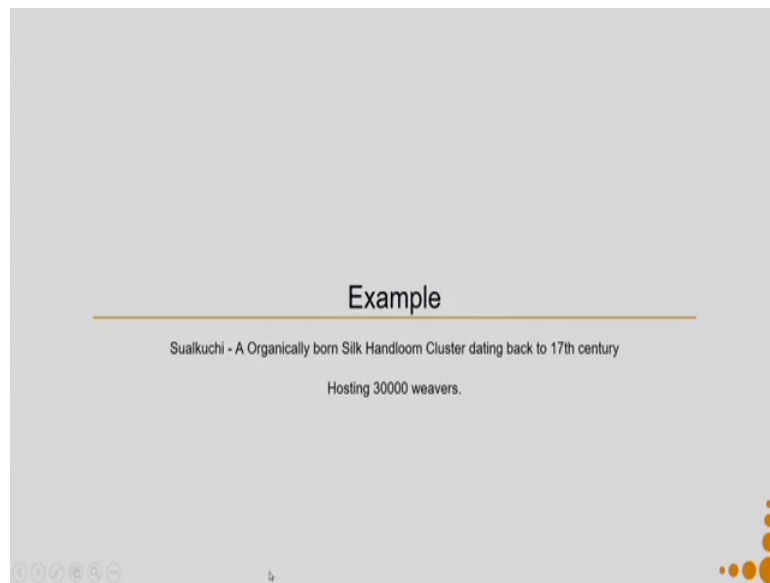
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There will be many households say for example, in craft there will be village after village, and every household is a single entity. They might be times that they are organized under a cooperative, but in most cases they are not organized they work as individuals or they work as small group of craftsmen doing the activity. So, we call this as a distributor.

So, it is not a centralized organization, where there is like a company which is say a production or manufacturing company is a centralized entity, because the production manufacturing everything is done in a centralized manner. Whereas, in distributed economy there is no one company who is engaged in many different companies or many different units or many different individuals produce the product, and then sell it into the market.

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So, let us see an example of Sualkuchi it is organically bond silk handloom cluster dating back to the 17th century. So, when we were talking about distributed a particular economic activity can be distributed in terms of design, manufacturing and knowledge generation.

So, if in case it is distributed in terms of design, what it implies is there is no one designer who gives all the designs and everyone else makes those designs. Usually in a centralized organization there will be a design team home makes the design and there will be a team which produces those design. So, in that case that is a centralized design activity, but in case of craft or handloom sector there are many designers each entity might have their own designers. So, the weaver himself or herself might be a designer and coming up with interesting new designs.

So, the in distributed economy the design can be distributed. So, we call it distributed design. You may also have the manufacturing happening in a distributed manner so, there are many weavers who are not organization under one organization and each of these weavers is independent and they are manufacturing they are products independently. So, in this case the manufacturing is happening in a distributed manner. Another way is distributed knowledge generation so, any kind of knowledge. So, say in our universities see system, teacher is the centralized entity who dissipates knowledge as well as tries to

generate knowledge and the students listen to the teacher so, that is centralized way of knowledge generation.

Whereas, in distributed knowledge generation, everybody in the community everybody involved in the trade is involved in knowledge generation and knowledge dissipation. So, in the distributed economy either all these three can be happening that is distributed design, manufacturing and knowledge generation and dissipation or otherwise any one or two of the activities can be happening in a distributed manner

So, Sualkuchi is a silk handloom cluster in Assam, the mention Sualkuchi is a very historical place even in documents of Chanakya, mention of silk from silk and silk garments Sualkuchi is there. So, it dates back to that particular era, but the handloom industry as we know it today, started gaining its current shape during the 17th century when the Ahom kings of Assam cluster them together and they started because silk became a symbol of royalty.

So, the whole industry started booming in a big manner. At this point of time this particular industry it holds more than 30000 weavers, why do we call it organically grown? Because it is distributed in nature there is no company which brought in together in that particular shape.

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So, let us go through a journey of the whole silk industry in terms of stakeholders and then I will talk about how this fits into our definition of socio economic ecosystem. So, these in Sualkuchi there are three kinds of silk which is oven, Muga silk a Tussar silk and Mulberry silk. Muga silk is unique to Assam and you can see there is other moth from which the Muga silk comes

So, these are the butterflies and these are their eggs, when the moth comes out of it you will get silk oven around the moth Muga silk is golden in color. Muga silk grows only in the remote parts of Assam in the hilly areas in the jungles, this particular silk is not a domesticated silk. So, this particular stake holder the producer of silk does not belong to Sualkuchi. The other two silk tussar and mulberry tussar comes from central India and mulberry comes from southern India and China.

So, again Sualkuchi does not have any stake holders involved in production of silk the raw material silk, but they do have a training center where training is provided to be anybody who is interested in growing silk.

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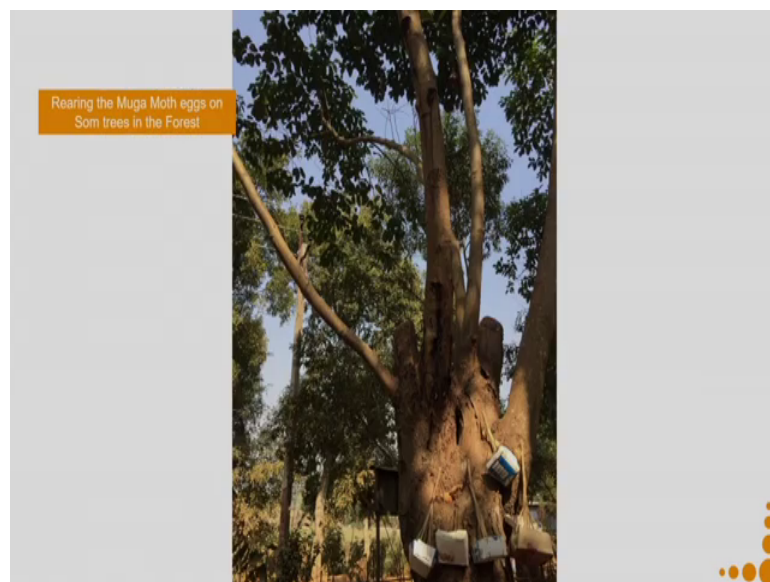
So, this is the so, in order to do the rearing of the Muga moth, the eggs are kept in a cardboard basket like this and it is hang on a Som tree.

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So, different species of silk they feed on different kinds of trees. So, the eggs will hatch and then they will start climbing up on the trees because they want to feed on the leaves.

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Once they start feeding on the leaves and they become bigger and bigger, before they have to before the silk worm starts binding itself into its own saliva which is the silk it will start coming down.

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So, below that so, this is the grown up moth we did not have lectures of the grown up moth for the Muga silk, this is the eri silk worm, eri is a domesticated silk worm. So, we could this is in the house leaves have been kept and their feeding on to it.

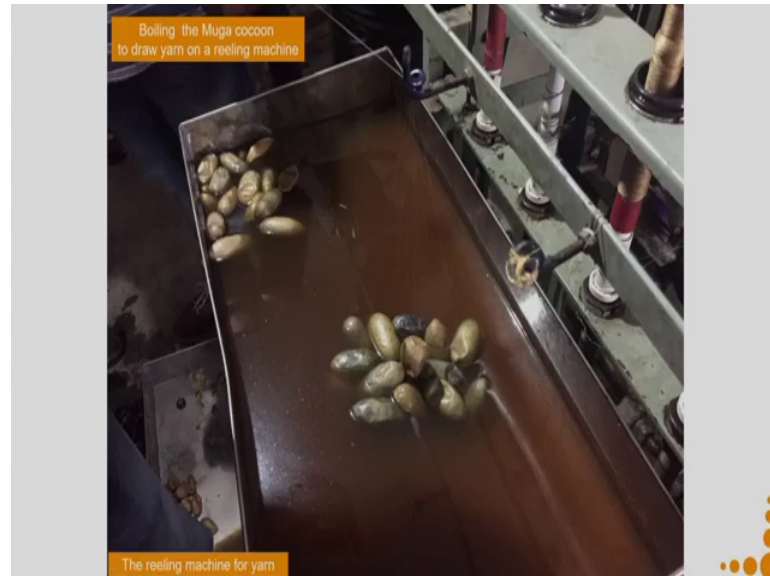
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Once the silk worm have achieved the maturity stage and before they will start winding with them self with the silk in around them, this start coming down the tree where there are nets are placed. So, they are collected on the net so, that the silk is not contaminated with say leaves or a soil and so on. So, this is how the Muga look like you can see the

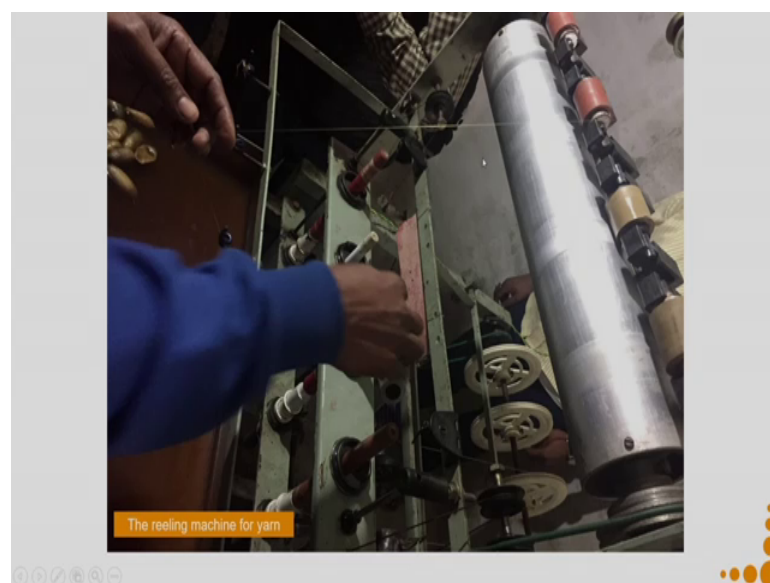
golden natural golden color in this particular silk. So, the Muga silk is not dyed with colors because people value it for the natural golden color that it has.

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Then again Sualkuchi is since Sualkuchi is not involved in rearing of silk, there are also not any stake holder involved in getting the thread out from the Muga cocoon and making the yarn. But it does have the training centers, which can train people in doing activities.

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So, in order to get the yarn first so, you can see this is a water bath along with some salts added to it. So, the cocoon is dipped into it, as a result the moth inside it dies and then an expert knows here you can see the very thin threads. So, one Muga cocoon will have around 12 kilometers of silk thread.

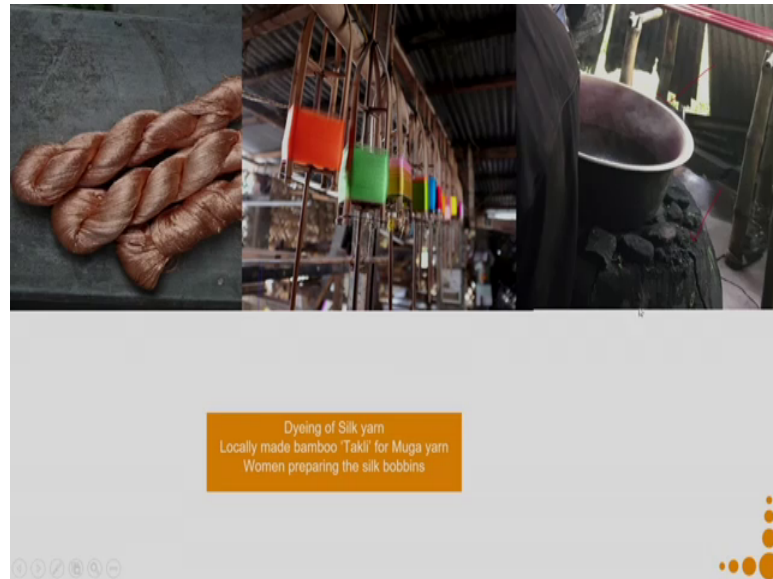
So, an expert can easily find out the starting point of the thread and then couple of threads will be together, spun into by using this machines spun into a yarn. So, you can see that the threads are coming over here and they are being wound into yarns. So, this is called as a reeling machine for the yarn.

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Once you get the yarn, this is in this kind of shapes. So, you need to pull it to straighten it otherwise your garment will be very wavy in shape. So, here again you can see that there are some machines these are the traditional equipments used for doing this particular activity, but some grass suit innovators have also come up with some motor driven machines or machines in which a cycle is being used to do the rotational activity.

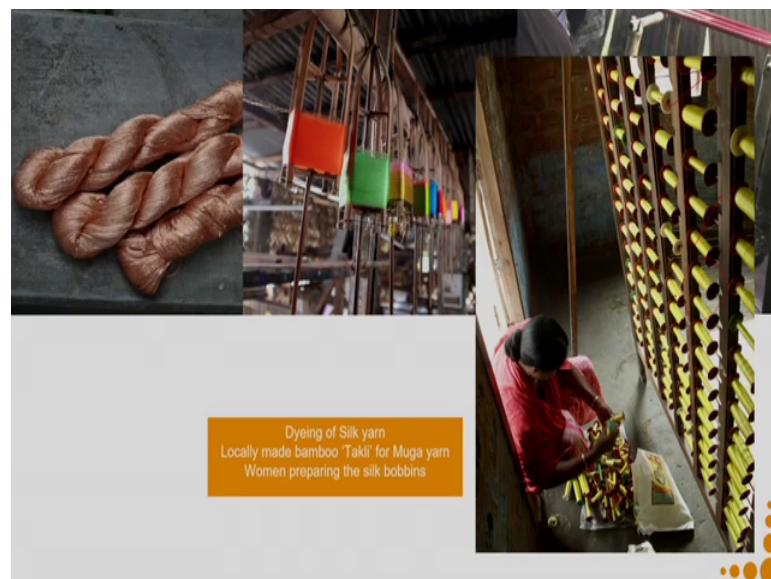
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This is how the dyed silk looks like. So, the mulberry and the tussar silk is dyed in a color whatever is the requirement.

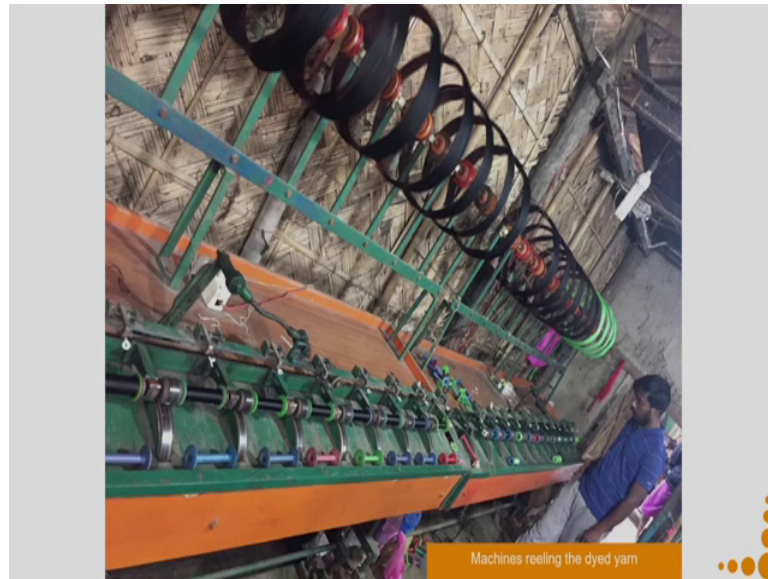
So, you can see the different kinds of colors it has been created. For dyeing the use coal fired or wood fired fire, and a huge container in which they will be boiling water along with the dye they will dip the yarn into it and get the dyed yarn.

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Here you can see these are this lady is making all these bobbins, and preparing for the weaving activity to happen.

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So, this is another machine which helps in doing the reeling activity after the yarn has been dyed. Now, coming to the loom in which we will be weaving this machines.

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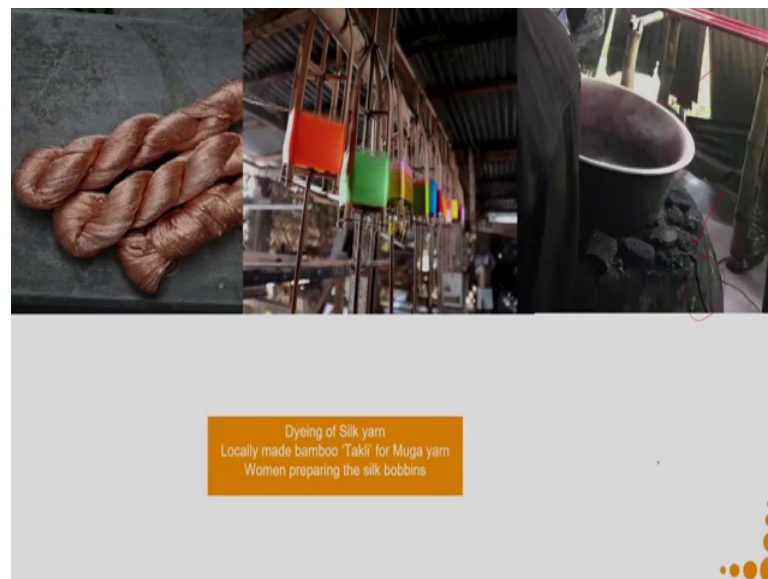
So, this s, the Sualkuchi is main work is in the area of weaving. So, from so, this particular reeling activity is also happens in Sualkuchi. So, at every entrepreneur of weave weavers house, depending on whether they can afford a machine or they cannot afford a machine then in that case they will be using.

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Hand processes of these kinds, in case they can afford a machine.

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Which means they are larger scale producer of silk garments they will be using some kind of machinery. People who help in doing these activities they are stake holders. So, they are called as helpers.

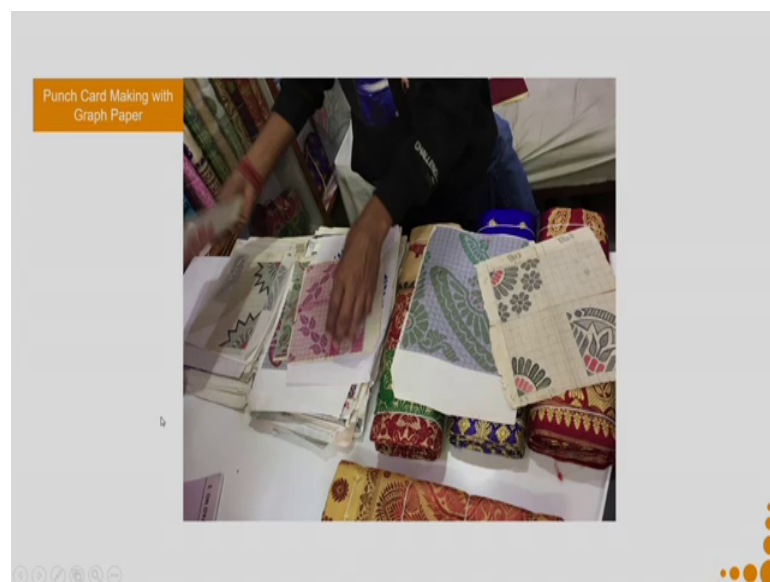
So, they help the weavers and the other people in dying and other activities. The people who specialized in making the reel are called as reelers. So, the reelers are paid on then

amount of work they do. So, they are contractual employees they helpers are paid on a monthly basis now coming to the Jacquard loom. So, this loom was designed by a person called Jacquard. So, hence his this loom is called as Jacquard loom, what it consists of say you can see this is called as a punch card. So, all the design which has to be made into the garment is punched onto this punch card.

So, this particular loom you can see over here so, this is the jacquard part of it, which consists of many hooks. So, it picks up the threads over here. So, you can see the jacquard part of it this part of it over here and it is connected through lots of threads to my entire width of the saree or the mekhela chador or which they are going to weave.

And depending on the design certain threads will be picked up from here see this thread is picked up this thread is picked up, and then I will pass on a horizontal thread which is a colored thread. So, this is another weave of the loom. So, the person who is going to weave over here and does a weaving activity these are the pedal, which I used to make the loom work. So, this is a closer weave of the punch card. So, you can see the holes, these holes. So, each punch card is one line of the design.

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So, this is how a punch card is made. So, say I have a design of this kind, I will put it on a graph paper where each millimeter of the graph paper is one line on the cloth. So, then each also if I have this particular line over here, if there is a design element over here and design element over here.

So, on that one punch card I will have these two holes. So, punch card making also happens in Sualkuchi and there are specialized people who make those punch cards. Computer softwares are also available to do this particular activity in Sualkuchi people do have the software, but not many people use those software. Earlier the punch cards used to be punch manually, but now they do have machines to punch the cards. The big problem with the punch cards is they are made up of card boards of course, that is recycled paper, but one set of punch card can be used to make maximum of 10 pieces of say sarees. And after that the one has to make new set of punch cards for the same design. So, punch cards is a huge amount of wastage in Sualkuchi.

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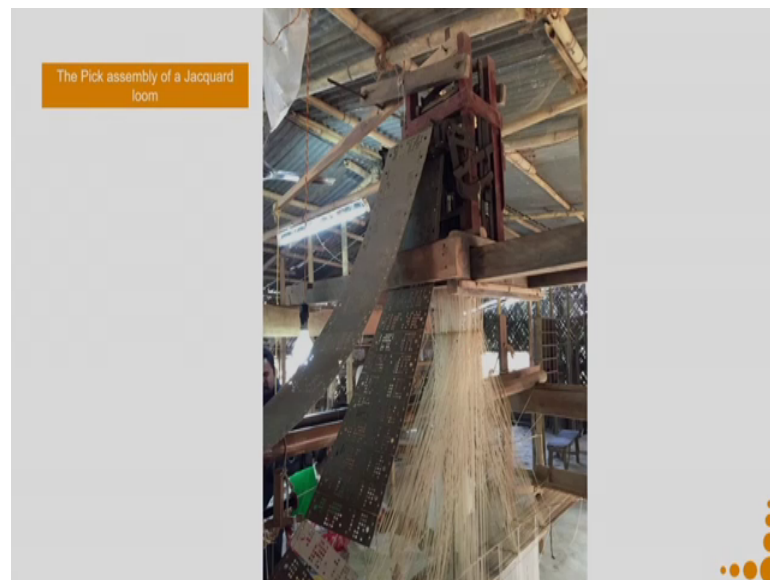
So, this is how the pick assembly of the jacquard loom looks like. So, you can see that it has some rods in this direction and some rods in this direction. So, they are connected to each other and when the punch card is so, the punch card is over here the punch card is picks up some of these vertical rods which helps to move those these horizontal rods, and as a result different kinds of threads are picked up. Sualkuchi also have people who specialize in repairing jacquard looms, and also setting up jacquard looms say another set of stakeholders involved.

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So, now somebody has to prepare the loom, as you could see in the previous slide each of these threads you can see what a complex mesh of threads is that.

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And for each and every piece of saree I will have to reset this whole thing. So, there are specialized people who do it. The weavers also know to do this activity, but for if a weaver tries to do it takes around 6 to 7 hours because they are not specialized people. So, in this particular area every job is very very specialized and they have specialized people to do it. So, they are the specialized people who do these activities.

So, this person because this person is a specialized person so, he might take only 2 hours or 3 hours something like that, to do this particular activity. So, now the loom is set. So, this is the entire. So, this entire length of the garment, this part is set on a rotatory mechanism.

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So, as a as and when you are you weave each and every line this whole thing moves forward by rotation. There are times when there will be some threads which will which might break over here, but the weavers are trained to join those weave. So, they will tie knot over there.

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So, you can see a weaver sitting over here and trying to weave in order to protect the garment from getting damage because of your sweaty hands and so on. So, cotton towel will be put over here and then, you can see the weaving is happening over here and the oven cloth gets owned around this. So, over here there is a rotatory mechanism over here there is another one. So, weavers are the most important set up people over there, they can be multiple types of loom owners.

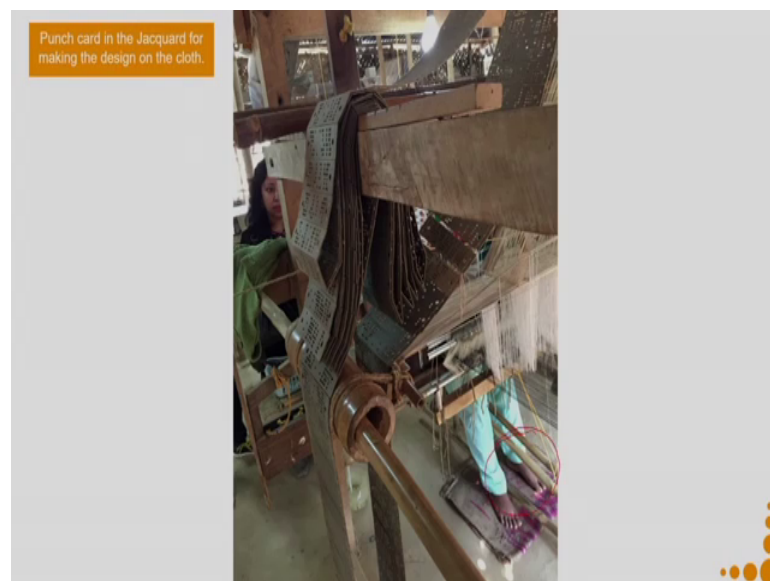
So, the person who owns these jacquard is a loom owner, people who have there are also households who have one or two looms in this case the weaver and the entrepreneur is the same person. They weave themselves and with the help of their family members. In case a family has more than 5 looms then most of the time they do employee weavers, weavers are employed on a contractual basis. So, you get paid for how much duration of time do you sorry for how for the length of the cloth that they weave and the number of design elements that is present.

So, more one weaves more one can make money also the way in which the weavers are employed because weavers are pretty strong entities over here in this set up. So, here comes a benefit of having a distributed set up; if there was one person who owned all the looms or if there were only 2 or 3 persons who owned all the looms that would be called as a centralized system. So, this 2 or 3 persons will be different companies in that particular case.

Now, if there are only 3 companies. So, the weaver becomes very dependent, that I need to be weaver in either one of these 3 companies to make my leaving. But over here since its distributed there are very few people in Sualkuchi who have more than 50 looms vega who are the big entrepreneurs. Most of the looms are; most of the entrepreneurs have lesser number of looms as a result the weaver has lot of options where they can go and on as a result their bargaining power in the whole ecosystem is quite high.

In order to engage a weaver usually entrepreneurs have to pay them first and advance amount, which can run into something like an 15 to 20000 rupees and then the weaver starts weaving with that particular entrepreneurs. The weaver is always free to leave the work and go to another entrepreneurs place. Usually people start weaving from around 8 or 9 in the morning, then they take around 2 to 3 hours of break in the afternoon then again they start weaving. During the peak seasons that is the festival seasons the weavers work quite till long hours and they get paid accordingly because they are paid as per the length and the design that they number of design elements that they make.

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So, this is where the weavers feet is at work on these 3 bamboo rod, which help to move the loom.

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This is the horizontal this is called as the shuttle. So, here you can see this golden weave which is the horizontal golden weave that is made because of this.

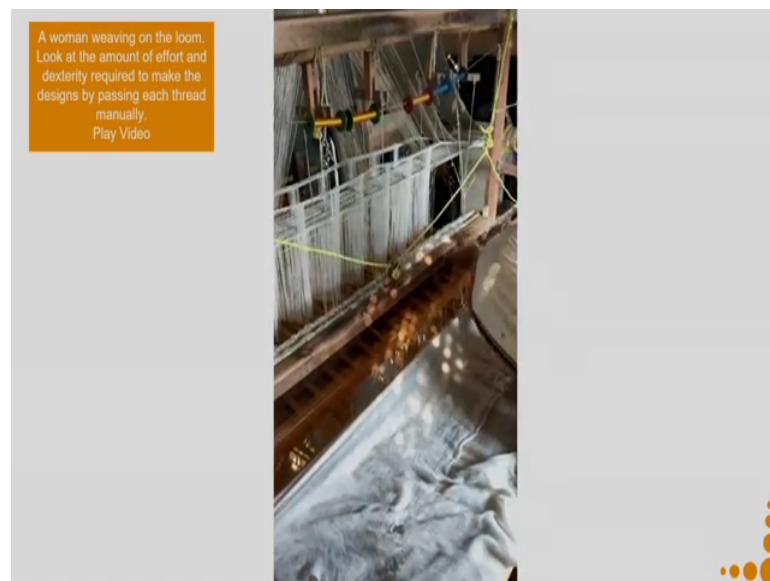
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So, this one happens automatically because it put over here in the slot, and when the weaver pulls this thread, this shuttle makes travel from this point to this point. Then again the weaver will pull this shuttle will travel from this point to this point now comes how to make this designs.

So, you the blue design part that you can see. So, there are these threads over here. So, the jacquard loom will pick up certain threads, and the weaver has to manually put this threads one by one and create the design. Now you can understand why the weaver is paid on the basis of length of the government as well as the design elements done. Because the number of design motives that you have to do and the bigger the design motive the amount of effort is very high. So, let me show you a video of how the loom works.

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So, here you can see that in order to make that design she is taking the thread, and it took a so much of time to do this particular activity. Then she again made the horizontal lines, which do not require the design then now she is again bringing in the threads.

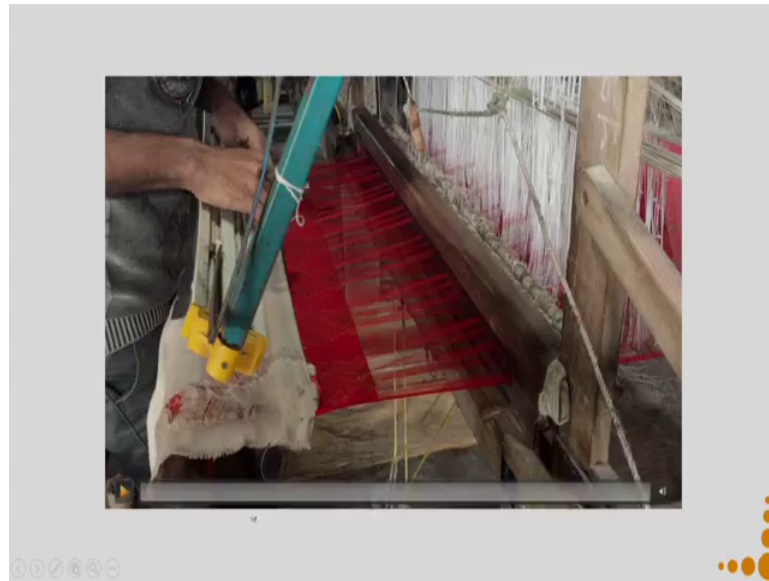
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So, local innovator came up with an innovation in order to. So, there is another set of stake holders in this ecosystem. These are grass (Refer Time: 24:36) level innovators they live in this ecosystem they have grown up in this ecosystem, and they know weaving and they know the problems in and out and they come up with small interventions. This person's intervention he is Deepak Bharali has been very successful and it has been adopted in many parts of the country, and also many in many global locations his product has gone wherever there is a handloom activity happening.

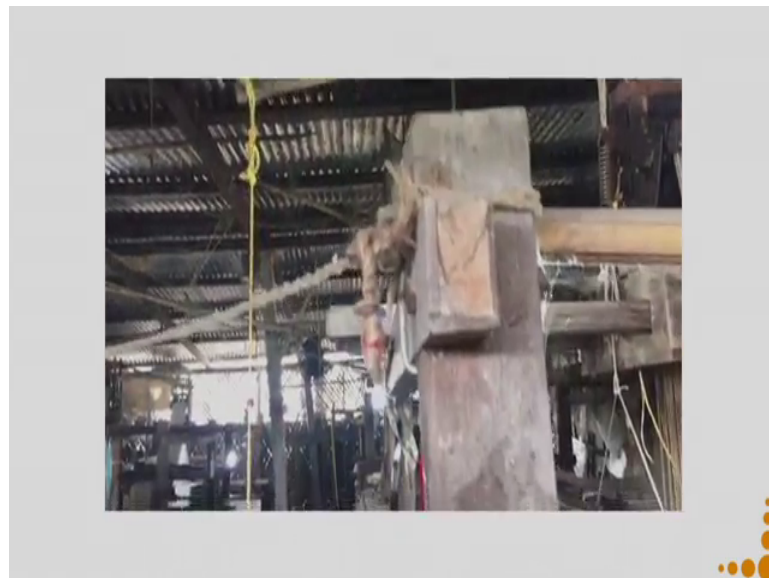
So, what happens is these are magnetic based bobbins and. So, I will show you a picture in just one go. So, something which could have taken about 30 seconds 15 to 30 seconds depending on the number of design elements, now only takes 2 seconds to do.

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So, you can see in this video. So, this person is making the horizontal weaves and then just moving this particular arrow this is how is.

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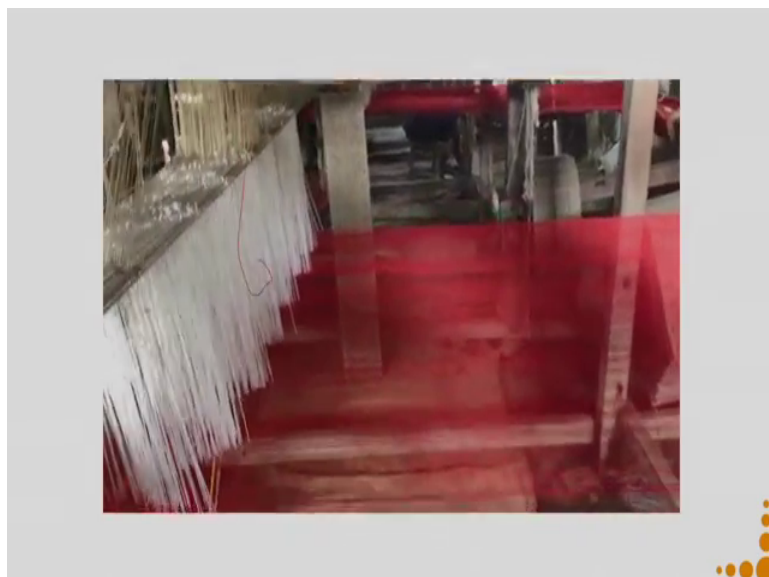
You can here see how the whole loom works. So, this is the thread connected to the jacquard and then it is connected to his peddles, which are operated by his legs.

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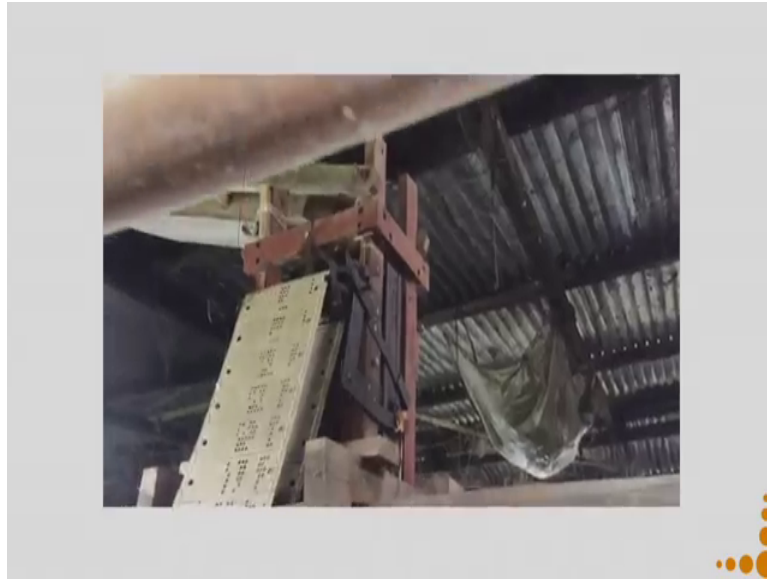
So, now you might imagine that because this innovation has become now making designs as becomes so easy. So, it must be like you would have adopted it, but there was huge problem in adoption because weavers who also used to doing it in a particular manner they did not want to change. But younger weavers they were more ready to accept this particular design.

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Also the weavers argued that if introduction of this design reduces their income because now making those design elements.

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The motives is becomes way much more less time consuming they are not going to use it. So, all the entrepreneurs in the region agreed that.

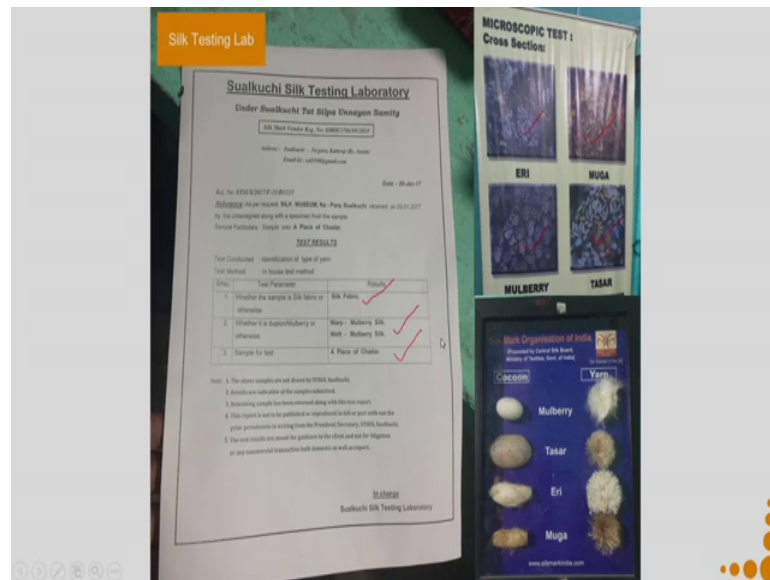
We use the device to increase your productivity, but we do not reduce your payment which is on the basis of making the design element. So, here you can again see the importance of having a distributed economy, the strength of the stakeholders is pretty high.

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This is another aspect. So, within this red color you can see this yellow color and green color thread. So, that is called as Meena that is even more time consuming, and still it has not been mechanized and the weaver gets much higher payment for doing a Meena.

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Another upcoming stakeholders so, many Sualkuchi did not have any trademark till 2016. So, there were lot of replicas and fake products of Sualkuchi in the market. So, the problem with replicas was still lower because of course, if it is still silk, but if it is a fake item and sold in the name of Sualkuchi silk, the whole brand image of Sualkuchi would go down. So, there was also huge protest by people in the same because of this kind of fake activity happening.

So, as a result samiti was formed Sualkuchi Tat Unnayan Samiti and they are trying to come up with new sets of developing new sets of stakeholders with solve these problems of current way of production and consumption. So, there one of their intervention was applying for a trademark. So, in 2016 they got a Sualkuchi trademark.

So, now, all the products come with Sualkuchi trademarks. So, it is something similar to Banarasi saree which has a trademark, they will also go for a geographical indicator. So, first getting a geographical indicator is more difficult, but once you get a geographical indicator it will ensure that anybody producing silk outside Sualkuchi cannot call it as Sualkuchi silk. Step 2 was setting up a silk testing lab. So, what this lab does is, it first tests whether the garment is made up of silk or not because there is lot of fake products

made of polyester. Second it will test whether it is eri whether its Muga mulberry or tussar; it is also possible to make garments with a combination of all that.

So, the horizontal thread can be one silk and the vertical can be another silk and then. So, they do this testing and then they certify whether the fabric is silk. So, yes it is silk fabric, the second certification is the war pen the horizontal thread and the vertical thread, what kind of silk has been used and which for which piece it has been tested.

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So, each and every garment is tested and you can see the certificate this is the certification which is issued by them, and it is for each and every piece of garment it is not meant for like one garment in a lot of 10 or 20, it is for each and every garment. Also silk mark is another mark that is given by the government of India it is given to a company it is given to a company on the basis that this company produces silk products. And it needs to be renewed after regular intervals of time, but this is the one which is supposed to be done for each and every piece of garment.

So, a very important stake holder who has come up so, now most garments sold in Sualkuchi has this particular mark. So, the buyer can be very sure. Even the test lab also provides us facility that me as a buyer, if I want to see whether I have got a genuine product or not I can work into this testing lab and get my product tested.

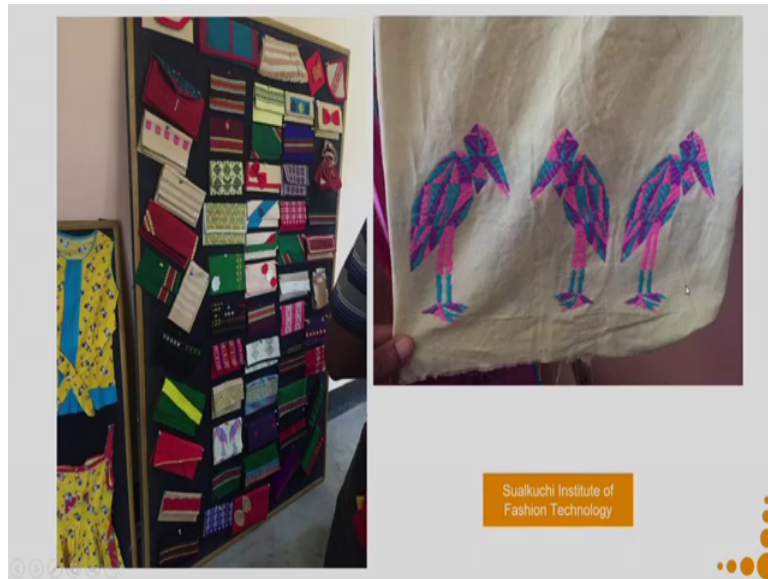
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Another stake holder this is called as Sualkuchi institute of fashion technology this is a training institute. So, they give 6 months and three months diploma in weaving in fashion design with silk and so on.

These are local women who and men who get trained. They are also engaged in developing alternative products. A big problem with this Sualkuchi silk industry is mostly they make mekhela chador, which is the Assamies traditional dress which is own only in the state. So, outside the state the market is very limited they also make sarees and also make sarees, but the quantity is way much more lesser. To get a bigger market rate one has the whole industry has to also come up with new products. So, this institute is also engaged in experimenting with such things also new motives to come out.

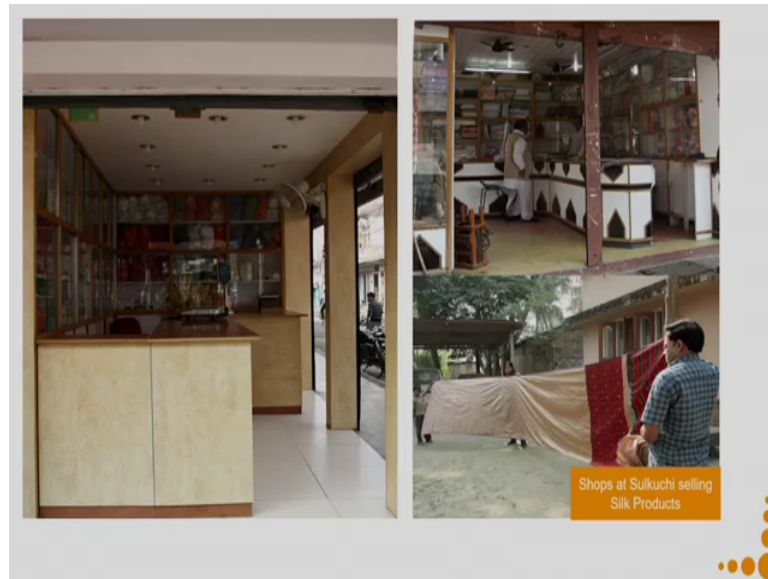
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So, you can see their trying to develop some kind of a motive this is a rear bird available in the state, and their trying to develop how the motive will look like in color in different kinds of background and so on. So, that is another activity that they are engaging in. Currently all the designs which are happening in Sualkuchi they are also done it in a distributed manner, there are many designers in the in that location who make their own designs. Either they make the design themselves or they will have contacts with their customers.

So, nowadays many customers buy using Whatsapp or Facebook they send them that I want this kind of a design. So, then the designer will make modifications. So, that the design can be oven you know handloom machine and creates a design and it is sold in the market.

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These are the shops in Sualkuchi where one can buy the silk.

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So, these are again the shops.

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These are the kind of products. So, this lady over here that you can see she is wearing a mekhela chador.

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What is a socio-economic ecosystem (SEE)?

- A context where the economic activities of the community is deeply ingrained in the socio-cultural ways of living.
- In such contexts it might be difficult to identify one company who is the promoter.
- The inherent nature of the economic activities is distributed in nature.

So who will own the S.PSS in this context?

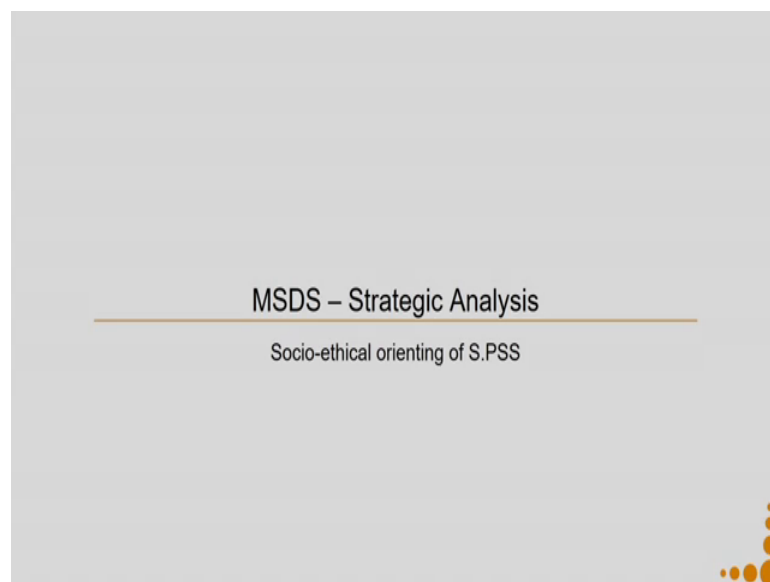
So, now coming back to what is a socio economic ecosystem. So, a context where the economic activities of the community is deeply ingrained in the socio cultural ways of living. The whole location everybody over there is either a weaver or realer or helper and entrepreneur most of them; and they are involved in the activity that is part of the socio cultural ways of living and the whole ecosystem has involved over edges, it has been

involved it has a very long historical background. The economic activities do not happen like it happens in a industrial context in such contexts it might be difficult to identify one company who is the promoter almost every house is promoter; almost every house has a loom. So, who is one company who will be the promoter.

So, you can see the difference from our previous context of fresh, where I knew fresh is the promoter. They might collaborate with many other companies to give the product and the service, but I still can identify a specific promoter, here that is very difficult to do. And the inherent nature of the economic activities is distributed in nature. So, there is no one designer, there is no one manufacturing unit, there is no one knowledge hub they are all distributed.

So, the question over here why our strategic analysis has to be different is because we have an important question who will own the SPSS in this context. In my previous context I knew fresh will own the SPSS, but here who is going to own the SPSS may be nobody is going to approach the designer also that do an intervention. So, in such context we had to follow a different kind of a approach for doing the strategic analysis.

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What we call this as a socio ethical orienting of SPSS. Although I want to have the environmental benefits and the economic benefits which are a must, but what over here starts first is a socio ethical orientating. Why say for example, I as I told you the weavers objective to the fact that the new mechanization should not reduce their income.

So, the new mechanism was adopted by some entrappers, but it does not make any change in the earning capability of the weaver. So, in because if the weavers is no I do not want to weave the entrepreneur do nothing. So, the in these context is very important to give a socio ethical orienting of SPSS.

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Process	Sub-process	Result	Tools
1. Project Socio-economic ecosystem analysis	Preparatory questionnaire for socio-economic ecosystems	Identification of actors and aspects of their activity	Awesome Actors Tool
	Infrastructure analysis	Identification of existing infrastructure and required transformations	KFPS Knowledge Mining Tool
	Project Actor Analysis	Need analysis of the actors	Empathy Mapping AEIOU Mapping Value Opportunity Analysis SWOT PESTLE System Map
2. Defining intervention context	Clarifying design goals	S.PSS problem statement, design brief, unit of satisfaction	Co-design using "Clarify Your Goal" section of Frog Collective Action Toolkit
	Competitor analysis	Competition space knowledge	Competitor analysis on form, category, generic, budget level Porter 5 forces analysis if applicable

So, let us first take an overview of the process in this particular context. So, what we start with is project socio economic ecosystem analysis so, before.

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Process	Sub-process	Result	Tools
1. Project promoter analysis and definition of intervention context	Defining scope of design intervention	Document specifying scope of intervention and design brief	
	Project promoter analysis	Summary of project promoter analysis: - Mission - Main expertise - SWOT - Value chain (actors, structure, etc.)	Preparatory company questionnaire miniDOC SWOT matrix System Map

So, if you remember in case of our previous version where it was a promoter project promoter based version my first process was project promoter analysis and definition of intervention context because I wanted to understand the project promoter. He is our company the way they do business they are machine their expertise and so on. Similarly in this context because the whole socio economic system is the promoter I need to first understand the project socio economic echo system.

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SEE			
Process	Sub-process	Result	Tools
1. Project Socio-economic ecosystem analysis	Preparatory questionnaire for socio-economic ecosystems	Identification of actors and aspects of their activity	Awesome Actors Tool
	Infrastructure analysis	Identification of existing infrastructure and required transformations	KFPS Knowledge Mining Tool
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Where first I try to prepare a questionnaire, to understand the socio economic ecosystem then understand the infrastructure requirement, and the existing infrastructure, then we try to understand who all are the actors involved the stakeholder involved.

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Process	Sub-process	Result	Tools
2. Reference context analysis	Production and consumption system analysis for the scope of design intervention	Summary of production and consumption system analysis for the scope of intervention: <ul style="list-style-type: none">- Identification of actors and their interactions- Identification of technological, cultural and regulatory dynamics	System Map
	Competitor analysis	Summary of competitor analysis: <ul style="list-style-type: none">- who are the competitors and what are the most innovative offers; how is the market segmented competitive position analysis	Model 5 Porter forces
	Client and/or end user analysis	Summary of client/end user needs: <ul style="list-style-type: none">- Analysis of expressed and latent needs	Exploring Customer Needs

In case of my project promoter base, my second process was reference context analysis where I used to try to understand the production and consumption system analysis of the scope of design intervention here you can see that because all the stake holders is already known, now I try to identify all the infrastructure and the stakeholders and their relationship Whereas, in my first case that was unknown.

So, then I do competitor analysis and client or end user analysis; here you can also see the scope of design intervention is well defined from the beginning itself at least defined to quiet a good extent. Whereas, in this context because there is no one promoter there is no one who owns the SPSS the definition for intervention context does not exist. So, me as a designer I have to create the definition.

So, my second process becomes defining intervention context, rather than in this one where I have already started with the scope of design intervention. So, I try to clarify the design goes; here because I cannot do the clarification of design goes by myself or by one company or one promoter I have to use participatory design process where I bring in all the stakeholders so, I have done this actor analysis. So, I will bring in all the actors and together we will try to clarify what is our design intervention goal. Once my design intervention goal is cleared then I can do a competitor analysis.

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Process	Sub-process	Result	Tools
3. System carrying structure analysis	General macro-trends analysis	Report on (social, economic and technological) macro-trends and their influence on the reference context.	
4. Analysis of cases of excellence for sustainability	Identification and analysis of cases of excellence	Summary of cases of excellence analysis describing <ul style="list-style-type: none">- offer composition and interaction with the user- Actors who produce and deliver the offer- Sustainability characteristics	Interaction table (storyboard) Animatic System map SDO toolkit – checklist best practices
5. Analysis sustainability and determine priorities for the design intervention in view of sustainability	Existing context analysis from an environmental, socio-ethical and economic point of view Defining the design priorities	Summary of the existing system analysis Definition of design priorities for each dimension of sustainability	SDO toolkit – checklist existing system

Once this part is done then I follow the next stages of the strategic analysis which are the stage the process 3, 4 and 5 are the same which is the system carrying structure analysis, analysis of cases of excellence for sustainability and analysis of sustainability and determined priorities for the design intervention in view of sustainability. What difference lies over here is say for example, in this particular case where we have to analyze the sustainability and determine priorities for the design intervention in view of sustainability, here I have to again do a participatory design process. Where I bring in the actors and I try to understand from them their sustainability priorities.

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Process 1: Project SEE Analysis

Sub-Process 1: Preparatory questionnaire for socio-economic ecosystems.

Result: Identification of Actors and aspects of their activities.

Tool: Awesome Actors Tool

So, how do we do the first process.

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SEE			
Process	Sub-process	Result	Tools
1. Project Socio-economic ecosystem analysis	Preparatory questionnaire for socio-economic ecosystems	Identification of actors and aspects of their activity	Awesome Actors Tool
	Infrastructure analysis	Identification of existing infrastructure and required transformations	KFPS Knowledge Mining Tool
	Project Actor Analysis	Need analysis of the actors	Empathy Mapping AEIOU Mapping Value Opportunity Analysis SWOT PESTLE System Map

So, the first process was preparatory questionnaire for socio economic ecosystem. So, the end result of this process will be identification of actors and aspects of their activity. We use a tool called as awesome actors tool. So, preparatory questionnaire identification of actors and aspects of their activity awesome actors tool.

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Awesome Actors Tool	
Asked to local administrators/local Visionaries	
1. What is the main value proposition of the local Ecosystem?	
2. What are the problems in the local ecosystem?	
3. Understanding the actors in the local ecosystem:	

Now, we will go and ask? So, as I told you in this ecosystem I gave you an introduction to the ecosystem because we have done a research over there when as a designer you


want to go to that ecosystem and you do not have much idea about it, going to each and every actor you even do not know which actor to go to is a long time consuming process and also very difficult process.

Hence in these context it might be more advisable that you first go to a local administrator or a local visionary, who has a good umbrella idea of the entire picture. And ask them the question like what is the main value proposition of your local ecosystem, what are the problems in the local ecosystem understanding the actors in the local ecosystem. So, from this local administrator or local visionary you ask these question; of course, you cannot ask these questions as they worded over here.

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Type of Actor	Actor	Contribution	Values added	Motivation	Problems Solved	Challenges Faced	Tools used	Interaction with other actors
		What they are doing?	What value does the actor bring to the ecosystem	Why does the actor choose to do what it does?	What are the problems that the actor is trying to solve?	What stops it from performing activities	What are the tools if any?	
Knowledge Actors								
Example:	Designer	Making of designs	Bring new designs to the Suaikuchi community	He wants to fulfill customers design ambitions	Design bridge between customer and weaver		Software, Whatsapp	
Production actors								
	Actor Name:							
Service actors								
Finance actors								
Administration actors								
Market Actors								
Customers/Clients								
Other Actors								



So, how do we ask the questions? So, this is a chart which can help you in asking the questions. So, first you have to identify what are the type of actors. So, we can have couple of types of actors, first types is knowledge actors. So, anybody who passes knowledge is a knowledge actor. Say for example, designer in our context is a person who is a knowledge based actor. Production actor who is involved in the production process so, say for example, the weavers, the reelers, the helpers, the entrepreneurs then you can have service actors. So, any body who is providing service.

There might be times where you are confused with this particular actor should be a knowledge actor production actor or service actor. In case you are confused you can put them in all of them and try to answer the rest of the question it cause no harm. Then there

will be finance actors who are providing the finance. Say for example, in this context Sualkuchi we figured out that there are certain financier's schemes, but because of many hurdles in way of accessing them they are not in used.

Then comes the administration actors which might be the local governments and so, on. Then market actors. So, in this case the whole sellers retailers can be the market actors, may be if some kind of online retailing is supposed to start then they can be the market actors, then the customers or the clients and any other actors if you think could not be accommodated in any of this type of actors.

So, then you try to understand from the local visionary or administrator that who all are the knowledge actors. What is their contribution that is what they are doing over here? So, say for example, designer is making design what values do they add. So, like the designer brings new designs to the Sualkuchi community.

So, value is different from contribution, in contribution what they are doing their activity which is making design. In value it is like they are bringing new designs to the ecosystem, then we ask what is the motivation? So, why does the actor chose to do what it does. So, he wants to fulfill customers design ambitions. Now when I am trying to fill up this particular chart, I am filling up this chart from the perspective of the local administrator or the local visionary. This I have to verify it again when we go into the field with the actors themselves, this chart what it helps me is to identify all the actors and their contributions and value added motivation and so, on.

I will again use this chart with the identified actors also when I go to the field. So, when I ask what are the problems that they solve. So, in this case designer bridges the gap between customer and the weaver; because the weaver or the entrepreneur has no such access to do the customer. The challenges that they face which is what stops it from performing their activities, then tools used what are the tools that the use if any. Say for example, in this particular context we found that they do use some kind of softwares and they also use Whatsapp to get from their customers what do they want and the interaction with other actors that they might be having.

So, the designers interaction with the entrepreneur with the local administrator and so on. Once this chart is filled our next task is to identify the infrastructure. So, it ends in identification of existing infrastructure and required transformations. When we reach a

local administrator or local visionary most likely because they are the administrator and they are the visionary they will have a good idea of what they want also for their infrastructure. So, we call this as k f p s knowledge mining tool.

So, again ask to the local administrator and local visionaries, our key information that we want to get is what is the service of product service transformations plan and required in the local ecosystem so, to do that we have this particular chart.

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Types of Infra		Existing conditions: Is the existing condition is sufficient?	Transformation required
Knowledge Infrastructure: (School colleges, data banks, information portals, traditional knowledge etc.)	Overall	The knowledge of growing muga is disappearing because no systematic	Younger generation should venture in the field to support the craft.
Specifics	SIFT	Offers 6 months training program in weaving	
Financial Infrastructure (credit, banking, loans, insurance and providing bodies etc.)			
Physical Infrastructure: Transportation, Built environment, energy, water etc.			
Social infrastructure: Socio-cultural norms, governing bodies, associations etc.			

So, first we want to know what are the types of infrastructure. So, I can divide my infrastructure again into knowledge infrastructure, which can be like schools, colleges, data, banks information, portals, traditional knowledge etcetera anything which is related to knowledge. Here you can see very important is traditional knowledge because in these kind of ecosystems the ecosystems main knowledge infrastructure is a traditional knowledge and one has to find out how it is being preserved or how it is being enriched or how it is dying.

Say for example, during our research what we figure out with this questionnaire was that earlier the weavers used to weave during a certain part of the year and during of season they would go and sell their products. So, the weavers and wherein direct contact with their customers, when they go to sell to their customers, their customer would say I want this kind of a design I want this kind of a color.

So, a kind of freshness was always maintained in their work and they had this direct knowledge, that what does the customer want; which because of the new system of doing in which weaver or entrepreneur never talks to a customer its designer, who is the interface and house to house selling and getting that kind of feedback is no longer part of the system. The whole design has become is no he has lost its freshness. So, what we do in this case is first we do find out each of the knowledge infrastructure, then for each specific knowledge Infrastructure I will write down what is the existing condition and what is a transformation required.

So, say for examples Sualkuchi institute of fashion technology was one knowledge infrastructure, what do they offer is six months training program in weaving and the transformation required was the connect to a still not there between the institute and the Sualkuchi as an industry. They were of both working independently of each other and quite separately from each other. So, after writing down all the specifics of knowledge infrastructure, then you write an overall which might be couple of sentences. So, in an overall what we saw that the younger generation should venture in the field to support the craft, the knowledge of growing Muga is disappearing because of no systemic.

So, that is not really part of sualkuchi, but sualkuchi suffering because at the source that information is getting damaged that also we can figure out. So, then comes your financial infrastructure, which is related to credit banking loans, insurance, providing bodies and so, on. Physical infrastructure which can be transportation built environment energy water and so on and social infrastructure, the socio cultural norms governing bodies associations etcetera. So, very surprised to see that so, Bihu is an important festival in Assam, for the festival view the weavers had got one month of vacation and that is the socio cultural norm over here. For mainstream industry it is very difficult to imagine that the whole industry will stop for an entire month, but here it is perfectly acceptable to everybody that during never Bihu the weavers will get one month of vacation.

Similarly they are the design elements that they build they also follow certain kind of socio cultural norm say for example, certain design motives cannot be placed near the seat. So, they will not be on the lower part of the saree or the mekhela chador, they will be on higher part of the mekhela chador chador.

So, once we have done this particular step, we have identified all these infrastructures we go to the third step which is the project actor analysis step where we try to do a need analysis of the actors. The need analysis of the actors is done on the basis of my preparatory questionnaire for socio economic ecosystem here I have identified all the actors and their activity. Now using this particular sheet I will go to each and every actor.

So, say I have weavers, I will go to different types of weavers and I will try to understand the needs on of each of them. Then I will go to different types of designers and we will try to identify different designers requirements. So, there are certain tools to do that particular activity empathy mapping AEIOU mapping value opportunity analysis, SSWOT pestle and systems map. So, we will discuss about this in the next lecture.

Thank you.