

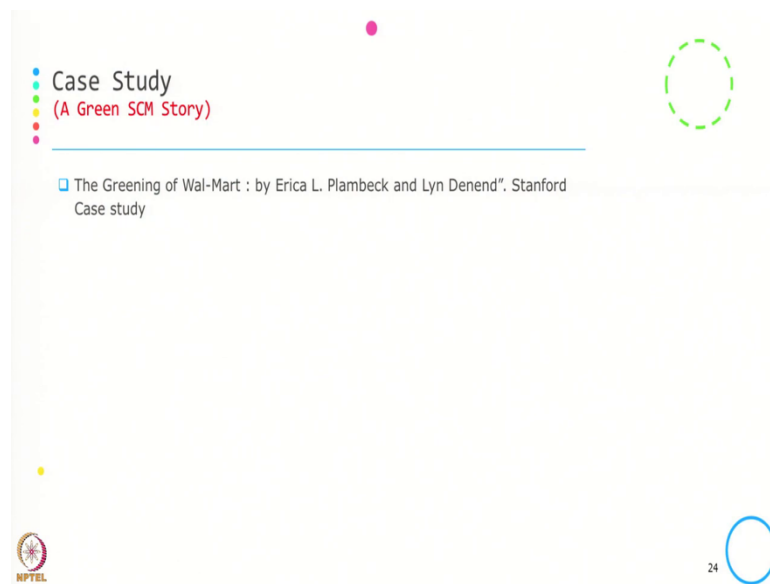
**Business and Sustainable Development**  
**Prof. Trupti Mishra**  
**Shailesh J. Mehta School of Management**  
**Indian Institute of Technology, Bombay**

**Lecture - 25**  
**Case Studies of Green Supply Chain**

Hello welcome to this session and if you remember in the previous session we are discussing about that how to incorporate green into the different loop of the supply chain starting from sourcing of raw material to the end disposal of the product.

So, what we will do in this session, we will take the very popular and also one of the earliest attempt by this organization Wal-Mart to green their supply chain. And we will discuss this case study and also we will take few recent examples by few of the organization that how they have incorporated this green supply chain practices into their supply chain.

(Refer Slide Time: 01:01)



So, this is based on Stanford case study on greening the Wal-Mart by Erica Plambeck and Lyn Denend.

(Refer Slide Time: 01:07)

The slide is titled "Case Study (The Story)" and features a list of bullet points. The text is as follows:

- October 2005, Wal-Mart CEO Lee Scott
  - launched a sweeping business sustainability strategy to dramatically reduce the company's impact on the global environment
  - To become "the most competitive and innovative company in the world"
  - committed the company to three ambitious goals:
    - To be supplied 100 percent by renewable energy
    - To create zero waste
    - and to sell products that sustain Wal-Mart's resources and the environment
  - To meet those goals, Wal-Mart would seek to
    - transform its supply chain, in cooperation with suppliers and environmental nonprofit organizations

At the bottom left, there is an NPTEL logo and the text "Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Flambeck". At the bottom right, the number "25" is visible next to a blue circle.

Now, to start with in 2005, Wal-Mart CEO Lee Scott he launched a sweeping business sustainability strategy to dramatically reduce the company impact on the global environment. And the goal behind is that, to become the most competitive and innovative company in the world.

And they committed the company into three ambitious goal to be supplied 100 percent by the renewable energy to create zero waste and to sell product that sustain Wal-Marts resource and the environment. To meet those goal, Wal-Mart would seek to transform its supply chain in cooperation with supplies environmental nonprofit organization.

(Refer Slide Time: 01:51)

**Case Study**  
**(Significant Initiatives)**

- Hired Blu Skye Sustainability Consulting to help identify the categories of Wal-Mart's products and processes that had the greatest environmental impact
- Identified 14 focal areas, bundled into three broad categories:
  - renewable energy
  - zero waste and
  - sustainable products

**EXHIBIT 1**

**Wal-Mart's 14 Sustainable Value Networks**

<b>Renewable Energy</b>	Global Greenhouse Gas Strategy Alternative Fuels Energy, Design Construction & Maintenance Global Logistics
<b>Zero Waste</b>	Operations & Internal Procurement Packaging
<b>Sustainable Products</b>	Textiles Electronics Food & Agriculture Forest & Paper Chemical Intensive Products Jewelry Seafood China

Source: Wal-Mart

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

26

Now, what they did to start with they hire a consulting group to identify the category in their product and process which are having more environmental impact. So, this job of this consultative group is to help Wal-Mart to finding out those in those points in product and process, where it is having the highest environmental impact.

They identified 14 focal area and all these focal area bundle into three categories renewable energy, zero waste and sustainable product. So, if you seen the picture which is in Wal-Mart sustainable value network you will find under this three category there are few focal area, where the impacts are more which can be to move for the sustainability goal here the intervention requiring in this loops of this focal areas.

(Refer Slide Time: 02:47)

**Case Study**  
**(Significant Initiatives)**

- Leaders of each Focal area
  - Responsibility of building a sustainable value network structure
    - Wal-Mart employees and representatives from government, academia, environmental nonprofits, suppliers, and other stakeholders
  - Goal
    - reduce environmental impacts
    - and derive profit from that positive change

**Wal-Mart's Sustainable Value Network Structure**

Source: Wal-Mart

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

27

Now, what they did? They created a sustainable value network structure where they found the leader of each focal area in term of executives in term of the manager and the responsibility of this leaders are to build a sustainable value network structure that is incorporating or you taking Wal-Mart employees and representative from government, academia, environmental, nonprofit, suppliers and other stakeholder. And what is the goal? The goal is to reduce the environmental impact and derive profit from the positive change.

(Refer Slide Time: 03:23)

**Case Study**  
**(Identify Goals, Metrics and New Technologies)**

- In 2008, Wal-Mart formally planned to use a system to measure and recognize its entire supply chain
  - based upon each company's ability to use
    - less packaging, utilize more effective materials in packaging,
    - and source these materials more efficiently relative to other suppliers
- Example
  - Web-based scorecard for packaging
    - evaluate each product's packaging against nine sustainability metrics,
    - including cube utilization, recycled content, CO2 per ton of production, and recovery value
  - Double the efficiency of Wal-Mart's trucking fleet in 10 years

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

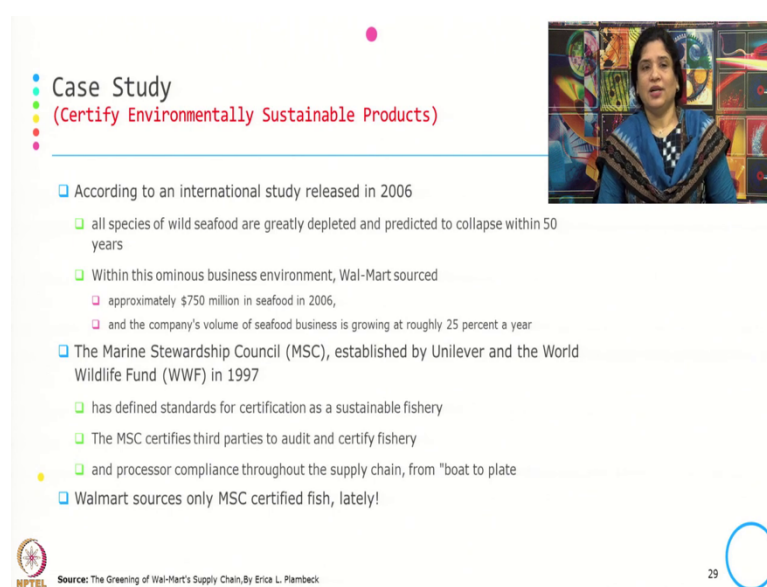
28

The first thing; so they take many steps to incorporate this environmental concern into their into the this focal area, they take they took many step and the one of the initial step what they did is to identify the goals metrics and new technology. So, in 2008 Wal-Mart formally planned to use a system to measure and recognize its entire supply chain based on each company's ability to use.

So, they did into less packaging, utilize more effective material in packaging, source this material more efficiently relative to other suppliers. The example is that they develop a web-based scorecard for packaging and which will evaluate each products packaging against the nine sustainability metrics include cube utilization, recycle content, CO2 per ton of production and recovery value.

And also the other example is that, although they initially they plan that how much should be the increase in the efficiency each year, but in their logistic or in their trucking fleet, but they double the efficiency the targeted the doubling the efficiency in next 10 year. So, mostly they are identifying the metrics where the changes are needed, the goals and also they are bringing the new technology in order to address the sustainability concern.

(Refer Slide Time: 04:45)



**Case Study**  
**(Certify Environmentally Sustainable Products)**

- According to an international study released in 2006
  - all species of wild seafood are greatly depleted and predicted to collapse within 50 years
  - Within this ominous business environment, Wal-Mart sourced
    - approximately \$750 million in seafood in 2006,
    - and the company's volume of seafood business is growing at roughly 25 percent a year
- The Marine Stewardship Council (MSC), established by Unilever and the World Wildlife Fund (WWF) in 1997
  - has defined standards for certification as a sustainable fishery
  - The MSC certifies third parties to audit and certify fishery
  - and processor compliance throughout the supply chain, from "boat to plate"
- Walmart sources only MSC certified fish, lately!

NPTL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

29

Then the other step what they did is, they certify the environmental sustainable product. So, there is a international study released in 2006 which says that all species of wild seafood are greatly depleted and predicted to collapse within 50 year. And at this point

Wal-Mart source approximately 750-million-dollar seafood in 2006 and the company seafood business was growing at the rate of 25 percent per year.

It means, they are also contributing that to that wild seafood because they are sourcing it from there. So, what they did? They look at what are the certification available for this seafood. So, Marine Steward Council MSC established by Unilever and Worlds Wildlife Fund in 1997, defined the standard of nut certification as sustainable fishery. They certify the third party to audit and certify fishery and the processor compliance throughout the supply chain from boat to plate.

So, here then the Wal-Mart took that certification and also ensure that whatever the seafood they are sourcing that is only MSC certified fish not from any other certified. It means they are sourcing it from a source sourcing it from a what to say agency where there is a the environmental impact is less and the impact is associated from boat to plate.

(Refer Slide Time: 06:15)

**Case Study**  
**(Providing Network Partner Assistance to Suppliers)**

- Wal-Mart provides its suppliers
  - with valuable knowledge and process assistance
  - through its strong relationships with the environmental nonprofits in its networks
  - Eg: when the Chinese government threatened to shut down a number of textile dye houses, including one of Wal-Mart's suppliers, in order to reduce pollution in Beijing ahead of the 2008 Olympics, Wal-Mart immediately took action
    - put the dye house in touch with one of the NGOs in their network,
    - which helped it formulate a more environmentally friendly process that reduced its toxic output very quickly.
  - Wal-Mart (which became the world's largest purchaser of organic cotton in 2006) also agreed to purchase the organic cotton farmers' alternate crops

Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

30

Then the other step is that, they provide the network partner assistance to the supplier. So, they provide the supplier with the valuable knowledge and process assistance through its strong relationship with environmental non profit in its network.

The typical example is taken over here is that when Chinese government threatened to shut down the number of textile dye houses including one of the Wal-Mart supplier in order to reduce pollution in Beijing ahead of 2008 Olympics, Wal-Mart immediately got into

protecting their supplier they put the dye house in touch with one of their NGO in their network.

And the NGO help them to formulate the most environmental friendly process that reduce the toxics output quickly and in that way the supplier could save themselves from shutdown and in that process Wal-Mart played a role to connecting the supplier to the NGO and in turn that NGO helped them to how to reduce the environmental impact in their process.

Then Wal-Mart which become world's largest purchase of organic cotton in 2006 also agreed to purchase the organic cotton farmers alternate crops. Whatever the alternate crops they are doing harvesting, they also agreed in order to support their livelihood, they also agreed to buy whatever the alternative crop that is being harvested by the cotton farmer.

(Refer Slide Time: 07:41)

**Case Study**  
(Committing To Larger Volumes Of Environmentally Sustainable Products)

- Wal-Mart makes commitment
  - To buy a specified quantity of each product certified as environmentally friendly
  - Also gives its suppliers an incentive to develop and produce that product
- In its textiles network, Walmart learned that
  - along with the cost of certification, farmers faced a near-term reduction in yields with organic cotton farming, as well as the need to diversify crops
  - This forced farmers to alternate the planting of cotton with legumes, vegetables, or other cover crops to rejuvenate the soil

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

31

Then they committed to large volume of environmental sustainable product. So, they made commitment to buy specified quantity of each product certified as environmental friendly, also give it supplies an incentive to develop and produce the product.

So, in a textile network along with the cost of certification farmers they face a near term reduction in the yield with organic cotton farming as well as the need to diversify the crop. So, what the since there is a decrease in the yield and also they need to diversify the crop,

the farmers they get into the alternate farming of cotton with vegetables and other crops to rejuvenate the soil.

So, here they say that this also we discussed in the previous slide that Wal-Mart they only source the organic cotton and also in order to protect the livelihood of the farmer those who are into the organic cotton, they also committed to buy the whatever the alternate crop they are harvesting.

(Refer Slide Time: 08:41)

**Case Study**  
**(Cutting Out Middlemen)**

- An immediate but unanticipated benefit of (MSC certification in the seafood network—and of organic cotton certification in the textile network)
  - was full visibility of the chain of custody
  - and hence the opportunity to eliminate intermediaries
- By simplifying its supply chain
  - Wal-Mart reduced the frequency of seafood stock-outs
  - improved the quality of the fish it was receiving
  - reduced paperwork and transaction costs
  - and reduced the costs and environmental impacts of transportation

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

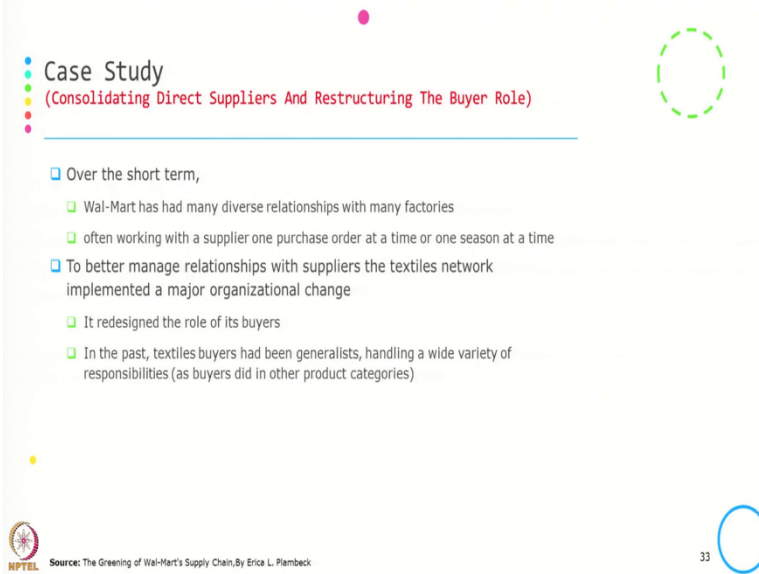
32

Then they cutting out the middlemen, the what they did is that in immediate, but unanticipated benefit is MSC certification in seafood network or organic cotton certification textile network.

The what they did is that, they since they have taken a certificate for both the seafood network and cotton and also in other cases, they eliminate the intermediary and they simplify the supply chain they reduce the frequency of seafood stock outs, improve the quality of the fish it was receiving reduce paperwork and transaction cost and reduce the cost of environmental impact of the transportation.



(Refer Slide Time: 09:21)



**Case Study**  
(Consolidating Direct Suppliers And Restructuring The Buyer Role)

- Over the short term,
  - Wal-Mart has had many diverse relationships with many factories
  - often working with a supplier one purchase order at a time or one season at a time
- To better manage relationships with suppliers the textiles network implemented a major organizational change
  - It redesigned the role of its buyers
  - In the past, textiles buyers had been generalists, handling a wide variety of responsibilities (as buyers did in other product categories)

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

33

Then they consolidated the direct supply and restructuring the buyer's role. So, what they did is that, since they were having many diverse relationship with the factory and they use often working in supplier one purchase order at a time or one season at a time.

So, what they did, they in order to manage the relationship with their all the supplier in the textile network they did some organizational change and they redesigned the role of buyers and in the past textile buyers had been the generalists handling wide variety of responsible responsibilities as the buyer did it in other product category. But they redesigned the role of buyer; they redesigned the role of supplier to make the process more efficient.

(Refer Slide Time: 10:11)

**Case Study**  
(Consolidating Direct Suppliers And Restructuring The Buyer Role)

- ❑ **Merchandising** (buyer)—Focused on the customer and understanding what the product assortment should be to best meet the customer's needs.
- ❑ **Product Development**—Focused on product design and trend execution
- ❑ **Technical Services and Sourcing**—Focused on creating the technical specifications for each product, deciding how to package it, and determining the best sourcing strategy, including supplier negotiations, pricing and quality.
- ❑ **Planning and Execution**—Focused on financial planning, ordering and inventory management, and store layout.

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

34

And what are the re how they restructure the buyer role? They put them into this different category started with merchandising, product development, technical services and sourcing, planning and execution and clearly identifying what is the role of in each of this. So, if someone is product development their role is just to focus on the product design and looking at the trend execution like what customer liking or what kind of product they are buying.

Similarly, there is a team which is working on planning and execution. So, typically the restructure buyer role rather than doing everything how each of them mostly the suppliers and buyers were they getting into this.

(Refer Slide Time: 10:55)

**Case Study**  
**(Licensing Environmental Innovations)**

- Suppliers' sensitivity about intellectual property is a barrier to improving environmental performance.
  - If one factory is significantly more energy-efficient than others, it's got an advantage
  - If it shares that information, the competition might gain a much better understanding of its production costs and therefore its profit margins.
- Encouraging suppliers to license their environmental innovations
  - opportunity to derive additional revenue from an environmental innovation
  - increase the suppliers' incentives to invest in innovation,
  - licensing the innovation also would lead to improved environmental performance across the industry and more widespread benefits for Wal-Mart.

NPTEL Source: The Greening of Wal-Mart's Supply Chain, By Erica L. Plambeck

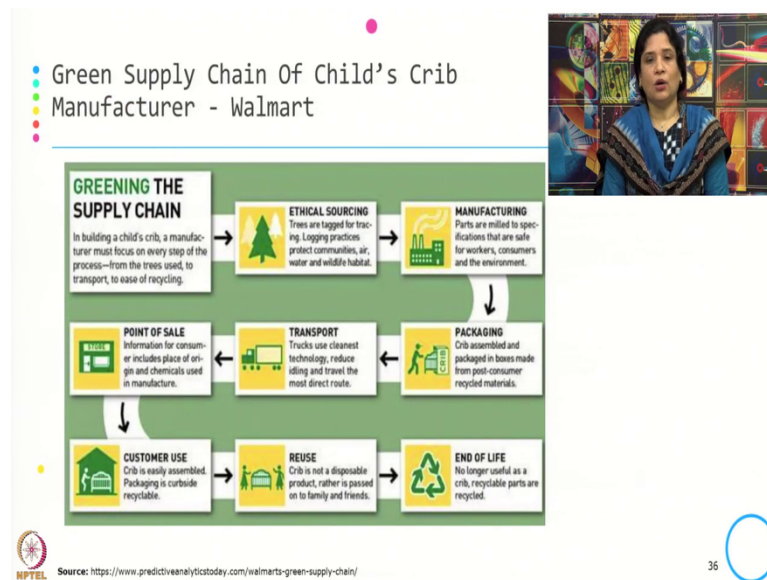
35

Then they license the environmental innovation and this comes from the concern that typically the suppliers they are very sensitive about the IPR and they cons and Wal-Mart felt that this is creating a barrier for improving the environmental performance.

The typical example can be over here is that, if one factor is signify one factor is significantly more energy efficient than others, then it got an advantage. But if they are telling that how they have become more energy efficient if they are sharing the information with others the competition might gain in a, much better understanding of its production cost and therefore, its profit margin.

So, although there is a positive view about sharing this, but the supplier is sensitive about the IPR that whatever the practices they are following how this can be given to the competitor. Now what Wal-Mart did they encourage the supplier to license their environmental innovation and by doing this, this gives an opportunity to derive the additional revenue from the environmental innovation, increase the supplier incentive to invest in innovation, licensing the innovation would lead to improve environmental performance across industry and more widespread benefit for the Wal-Mart.

(Refer Slide Time: 12:17)



Now, they have done all this thing to green their supply chain, here it is a very specific example what Wal-Mart typically practices in greening the supply chain for a child's crib. So, here this just a example that in building a child crib a manufacturer must focus on every step of the process from the trees used to transport and ease of recycling. It starts with ethical sourcing trees are tagged for tracing, logging practices protect community air water and wildlife habitat.

So, it is sourced from ethical sourcing, then the manufacturing parts are milled to the specification that are safe for worker consumer and environment, then point of sale information for consumer include place of origin, chemical used in the manufacture, transport trucks use the cleanest technology reduce idling and travel the most direct route there is a route optimization, packaging crib assembled and packaged in box made from post-consumer recycle material.

Customer use it is friendly crib is easily assembled packaging is curbside and recyclable, reuse crib is not disposable product rather it is passed to the family and friend and end of life when it is no longer useful as a crib, recycle parts are the recycle parts are recycled. So, if you look at for a child crib as a product starting from ethical sourcing, it is going the green is being practiced in each stage till reuse and end of life.

(Refer Slide Time: 14:01)

Apple - Attributes Of Supply Chain

Sourcing	Product Design / manufacturing	Internal Operations	Logistics & Packages
<ul style="list-style-type: none"><li>Apple suppliers are committed to 100 percent renewable electricity for Apple production</li><li>Apple's supplier energy efficiency program educates suppliers to identify new initiatives to reduce energy usage and manage projects</li></ul>	<ul style="list-style-type: none"><li>Focuses on design, like switching to low-carbon materials, improving manufacturing and material processes, and building energy efficiency into products</li><li>Taptic engine in iPhone 11 series (Pro, Pro Max) is built from 100 percent recycled rare earth metals</li><li>16-inch MacBook Pro consumes 65 percent less energy than the ENERGY STAR energy efficiency requirement</li></ul>	<ul style="list-style-type: none"><li>Uses 100 percent renewable electricity at Apple stores, data centers, and offices across 44 countries</li><li>Working in parallel with emissions reduction efforts, it scale up investments in carbon removal projects to restore ecosystems around the world</li></ul>	<ul style="list-style-type: none"><li>Focused on prioritizing modes of transport with lower carbon impacts without compromising on-time delivery</li><li>Partnering with shipping suppliers to leverage fleet improvements, sustainable fuels, and supply chain efficiencies.</li></ul>

NPTEL Source: Adapted from Annual report and sustainability report of the company

37

Now, after say after going through the case study now, let us see there are for few examples for the two three companies that how they are practices what they are putting it in the supply chain that can be categorized into the different attributes of the supply chain or bringing the green into the attributes of the supply chain. So, if you look at this is the case or example of apple, where sourcing Apple suppliers are committed to 100 percent renewable electricity for Apple production.

And also they have an energy efficiency program educates supplier to identify new initiative in reduce energy usage and manage project. Similarly, product design they switch to the low carbon material then they are building energy efficiency into product and also this tactic engine in iPhone 11 series is built from 100 percent recycled rare earth metal.

Then 16 inch MacBook pro consumes 65 percent less energy than the energy star energy efficiency requirement in this comes under the greening in product design and manufacturing. Similarly in internal operation they use 100 percent renewable electricity at Apple store data center and office across 44 country.

And also in case of logistic and package, they focus on prioritizing mode of transport with low carbon impact without compromising the delivery time on time delivery. And also they do a partnership with the shipping supply to leverage the fleet improvement sustainable fuel and supply chain efficiency.

(Refer Slide Time: 15:41)

**Success of Green SCM Strategy - Apple**

- Apple is recognized for six consecutive years in CDP's Climate Change "A List"
  - For Apple's work in reducing carbon emissions
- Apple was the only retailer to receive the top rating in the "Mind the Store" campaign
  - for its work to eliminate harmful chemicals in products and packaging
- Carbon neutral
  - Beginning April 2020, Apple is carbon neutral for its corporate emissions
  - It is currently investing in high-quality projects that protect and restore forests, wetlands, and grasslands
  - All final assembly sites for iPhone, iPad, Mac, Apple Watch, AirPods, HomePod, and Apple TV have been certified as UL Zero Waste to Landfill
  - Apple have reduced plastics in packaging by 58 percent in the last four years

NPTEL Source: Adapted from Annual report and sustainability report of the company

38

Now, this is the success of the green SCM strategy which is taken by apple, it is recognized in for six consecutive years as CDP's climate change A list for their work in the carbon emission, only retailer to receive the top rating in mind the store campaign, then they are the carbon neutral beginning in April 2020 Apple is carbon neutral for all its corporate emission.

Currently investing in high quality project that protect and restore forest wetland and grassland and all final assembly site for their product has been certified as UL zero waste to landfill and they have reduced the plastic by 58 percent in last 4 years.

(Refer Slide Time: 16:25)

Nestle- Attributes Of Supply Chain

	Sourcing	Product manufacturing / Services	Internal Operations	Logistics & Packages
Nestle	<ul style="list-style-type: none"> <li>&gt; Nestle responsible sourcing Standard with guidelines and mandates to be followed for its sourcing operations</li> <li>&gt; Farmer connect – Source directly from farmers to purchase coffee, cocoa, milk.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Member of RE2020, commitment to procuring 100% of electricity from Renewable sources</li> <li>&gt; projects compassing upgrading to LED, optimizing energy consumption, increasing biomass steam and recovering heat energy.</li> <li>&gt; Phasing out synthetic refrigerants such as CFCs and using natural alternatives like Ammonia, Water, CO2</li> <li>&gt; 27 factories certified by the Alliance for Water stewardship</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Sustainability by design program – systematically assesses and optimizes the environmental performance across the entire value chain in the earliest stage of product development.</li> <li>&gt; Create conducive workplace conditions that help all employees take personal responsibility for protecting the environment.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Commitment to make 100% of packaging recyclable or reusable by 2025. In 2019, 87% of the packaging were recyclable or reusable.</li> <li>&gt; Using recycled materials for packaging. In 2019, 26% of the packaging used in Nestle's operations contained recycled materials.</li> <li>&gt; In August 2020, Nestle Philippines reached Plastic neutrality.</li> </ul>

Source: Adapted from Annual report and sustainability report of the company

Then let us see what is happening in Nestle. So, Nestle responsibly when it comes to sourcing, they are sourcing operation from farmer mostly connect. So, directly from the purchase of coffee cocoa and milk, then in product manufacturing they are the member of RE 2020 commitment for 100 percent electricity from the renewable sources. Then optimizing energy consumption, then 27 factories certified by alliance for water stewardship these are the greening initiative in product manufacturing and services.

Similarly, they do in order to create awareness they do the training program for their employee and also they see that what is the sustainability can be brought into the design, then in logistic and package they make 100 percent packaging which is recyclable or reusable, 87 percent of packaging were reusable till now.

And using recycled material for packaging in 2019; 26 percent of the packaging used in Nestle operations contain from the recycled material and in August 2020 Nestle Philippines reach plastic neutrality.

(Refer Slide Time: 17:43)



**Progress So Far**

- Implement responsible sourcing
  - Target to have responsible sourcing of 80% of the raw materials of priority categories
- Improving Water efficiency
  - Reduce direct water withdrawals per tonne of product in every category to achieve overall reduction of 35%
- Reduce the plastic consumption by at least 140,000 tonnes from 2015-2020
- Make 100% of the packaging materials recyclable or reusable by 2025
  - In 2019, 89% of the packaging materials was recyclable or reusable
- Coffee Supply Chain
  - Target to improve the quality, quantity and sustainability of its coffee supply chain by distributing 220 million coffee plantlets by 2020
  - In 2019, 65% (200 million) improved coffee plantlets were distributed
  - Achieved 77% of the aim to achieve Zero deforestation within supply chain

NPTEL Source: Adapted from Annual report and sustainability report of the company

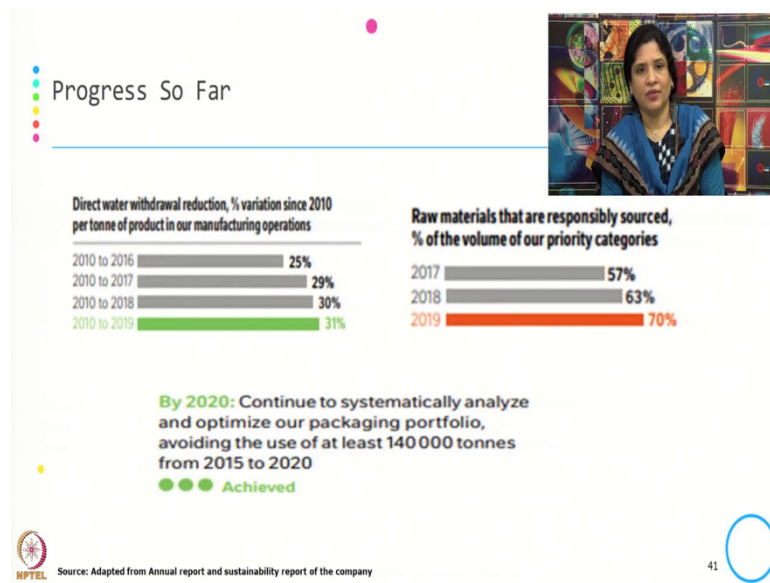
40

This is the progress so, far they have implemented responsible sourcing for almost 80 percent, improve water efficiency by 35 percent, reduced plastic consumption by at least 140,000 turns from 2015 to 20, make 100 percent packaging materials recyclable and reusable by 2025.

And in coffee supply chain the target to improve quality, quantity, sustainability in its coffee supply chain by distributing 220 million coffee plantlets by 2020 and similarly for the percentage 65 percent have been already distributed and aim to achieve 77 percent zero deforestation with supply chain.

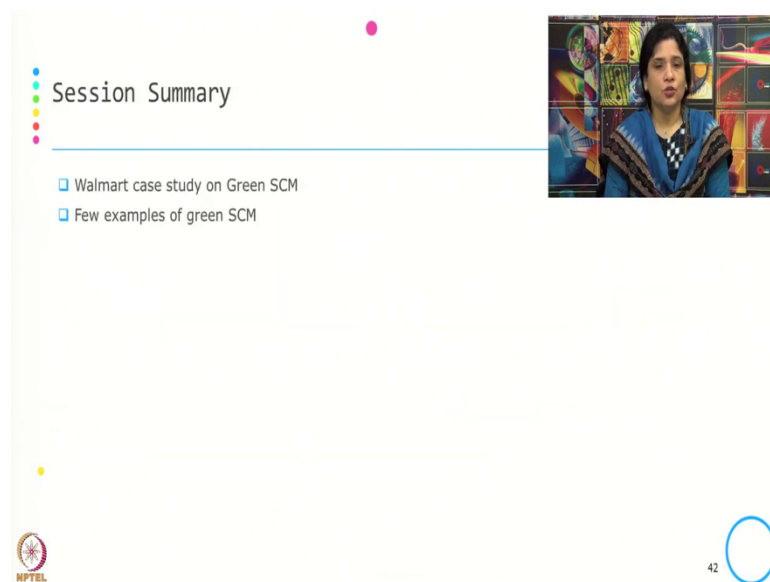


(Refer Slide Time: 18:27)



These are few of the evidence on with respect to raw material sourcing from the responsible sources and also the water withdrawal.

(Refer Slide Time: 18:37)



So, in this session what we have tried to do is to understand the greening the supply chain from through the case study of Wal-Mart and also the example of organization Apple and Nestle how they have brought the sustainability agenda or how they brought the greening action or greening intervention in their supply chain and also what is the performance it has improved because of greening the supply chain.

Thank you.