

## Episode 3 – ‘Small is Beautiful’

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- Hemant Lagvankar

This is the episode on the topic ‘Sustainability and Industrial Revolution’. The episode tries to focus on the drawbacks of present system of industries by taking review of the topic right from the industrial revolution which took place in 18<sup>th</sup> century.

The increasing demands of ever increasing population are pressurizing for large scale production. However, this is affecting environment adversely.

The episode emphasizes on how industries can fulfill needs of people in sustainable ways. It talks about the innovations and innovative practices. Also certain new concepts like ‘*cillage*’ are introduced through this episode.

### List of Characters:

<b>Chandra</b>	:	A school going boy – Age 13 to 15
<b>Devi</b>	:	Chandra’s younger Sister – Age about 10-12 years
<b>Papa</b>	:	Chandra’s Father (Age about 45)
<b>Dadi</b>	:	Chandra’s grandmother (Age about 70 years)
<b>James Watt</b>	:	A voice of old person having European accent
<b>Narrator</b>	:	Female voice

(The episode begins with a sound of agitation outside the factory gate. People are shouting, throwing stones and giving slogans with anger.... ‘*Nahi chalegi, nahi chalegi – tanashahi nahi chalegi*’, ‘*Hamari mange puri karo*’.... ‘*Worker’s Federation zindabad*....’ etc. On this background the dialogues start.)

**Dadi :** (From inside room) What’s going on outside? *Kon shor macha raha hai?*  
Chandra..... (Calling Chandra from inside)

**Chandra :** Nothing Dadi ji... it’s on television!

**Dadi :** Ohh! I thought...

**Papa :** Chandra, minimize the volume; it is disturbing Dadi ji.

**Chandra :** Yes Papa. (*Chandra minimizes the volume of television and the background sound fades*) ... but Papa, what is this? Why the mob has become so violent?

**Papa :** Beta, this is called as ‘strike’!

**Devi :** Yes... I know. Now a days, I get to hear this word frequently!

**Chandra :** Devi, just stop pocking.

**Papa :** Chandra, don't say like this. She is your younger sister. You should not talk like this with her.

**Chandra :** Sorry Papa. But... why these people are doing strike?

**Devi :** Yes... I also want to know about this.

**Papa :** Okkk. I will tell you. These workers are doing strike means they don't want to do work in the factory.

**Devi :** But Papa, why they don't want to do work?

**Papa :** Because, they have certain demands. And unless the factory owner fulfils these demands, they will not go to the work.

**Chandra :** Which demands, Papa?

**Papa :** Generally, the workers have a very common demand.... They want their salary to be increased.

**Devi :** Then what's wrong in it? The factory owner should increase their salaray!

**Papa :** Devi, the issue is not so trivial. It's a complex issue and has many facets... economical; and more importantly social.

**Chandra :** Papa, we are not getting what you are telling.

**Devi :** Yes Papa... Chandra is right!

**Papa :** Okk. I will explain you. Why does anybody set up a factory or an industry?

**Chandra :** To do business!

**Papa :** Correct! And business is done for the profit, right?

**Chandra :** Right!

**Papa :** So owner of the factory wants to earn more and more profit through the production. And hence, tries to increase production. Now to increase production, sometimes the owner starts exploiting the workers.

**Chandra :** Exploiting...?

**Papa :** Yes. With less salary, the owner forces workers to do more work... or curtails holidays and increases working hours... there are so many things! Sometimes the factory owners also do injustice on the workers.

**Chandra :** Hmmmm...

**Papa :** Then the workers start opposing the policies of factory owners. After all these workers are also human beings. They also have to run their homes; have to look after their families.

**Devi :** Yes.... You are right, Papa!

**Papa :** But Devi, sometimes demands of the workers also excessive and unjustifiable.

**Chandra :** How?

**Papa :** The cases were happened in which leaders of workers' union mislead the workers and force them to go on agitation.

**Devi :** Ohh Papa, the issue is bit complicated.

**Papa :** Yes! It's a social problem.

**Chandra :** But Papa, this is endless then. Everyone will continue fighting with each other and ultimately the industry will be ruined.

**Papa :** (Laughs) Nahi Beta... there are industries in our country.... And they are being run efficiently as well.

**Devi :** But Papa, when all these industries were started.... I mean not in our country; .... in the world.

**Papa :** Hmmmm.... Do you want to know?

**Devi :** Yes, Papa!

**Papa :** Then we have to go back in 18<sup>th</sup> century.... In 1763 James Watt, a Scottish mechanic, was asked to repair a model of a Newcomen steam engine. He saw how crude and inefficient it was and by a series of improvements made it a practical device for running machinery.

*(Flash Back Music Piece. On the background of this music, voice of an old person with European accent is heard)*

**James Watt:** I still remember those days. It was mid 1700s. I was just twelve years old.... a school boy. I was in the kitchen with my aunt. The water was boiling in teakettle. The water was boiling so hard that the lid of the teakettle began to jump up and down.

*(Give appropriate sound effect in the background)*

I was staring at the teakettle surprisingly. I was too fascinated with the teakettle to stop. When I held the lid down tightly, the powerful steam escaped from the kettle's spout. After removing my hand from the lid, it started to bounce again.

I learned about the power of steam when I was kid and later, put that experience to good use.

*(Change over music piece)*

**Papa :** So, James Watt invented a way to get even more power from the steam engine, without burning any more fuel. His improvements on the steam engine made it a more powerful tool.

**Chandra :** Ohh... that's wonderful!

**Papa :** Increase in efficiency of steam engine brought paradigm shift in England. In fact, the commencement of the 'industrial revolution' was closely linked to such innovations, beginning in the second half of the 18th century.

**Devi :** Industrial revolution?

**Papa :** Yes! Like the one which you are now experiencing in IT sector.

**Chandra :** But, before that were industries not present at all?

**Papa :** Most products people in the industrialized nations use today are turned out swiftly by the process of mass production, by people... and sometimes, even robots.... working on assembly lines using power-driven machines. People of ancient and medieval times had no such products. Prior to the Industrial Revolution, manufacturing was often done in people's homes, using hand tools or basic

machines. They had to spend long, tedious hours of hand labor even on simple objects. The energy, or power, they employed in work came almost wholly from their own and animals' muscles. The industrial revolution is the name given the movement in which machines changed people's way of life as well as their methods of manufacture.

**Dadi :** *Aare bhai*, we used to weave with our hands on looms in those days... but machines came.... and everything changed!

**Papa :** Yes...

**Chandra :** But Papa, nobody has opposed to these changes in those days?

**Papa :** (Laughs) Good query Chandra! Industrial revolution was opposed strongly by the luddites.

**Devi :** Luddites? Means....?

**Papa :** Devi, the word 'luddite' refers to a person who is opposed to technological change. The term is derived from a group of early 19<sup>th</sup> century English workers who attacked factories and destroyed machinery as a means of protest. They were supposedly led by a man named Ned Ludd, though he may have been an apocryphal figure.

**Devi :** (Laughs) Ohhh.... Interesting!

**Papa :** As Dadi ji was telling, the textile industry, in particular, was transformed drastically by industrialization. In fact it is thought that, the development of the spinning machine by Sir Richard Arkwright in England led directly to the rise of the industrial revolution, and a new world of manufactured products. Industrialization marked a shift to powered, special-purpose machinery, factories and mass production.

*(Sound effect of industrial machinery)*

**Chandra :** Industrialization must have changed the world... am I right Papa?

**Papa :** Yes Chandra! The Industrial Revolution marks a major turning point in history; almost every aspect of daily life was influenced in some or the other way. The

industrial revolution brought about a greater volume and variety of factory-produced goods and raised the standard of living for many people, particularly for the middle and upper classes.

**Chandra :** Ohh! That's great!

**Papa :** But Chandra there is other side of the coin also!

**Chandra :** Means....?

**Papa :** Life for the poor and working classes continued to be filled with challenges. Wages for those who labored in factories were low and working conditions were monotonous. Unskilled workers had little job security and were easily replaceable. Industrialization also meant that some craftspeople were replaced by machines.

**Dadi :** Yes! Many craftsman, weavers, .... became jobless! To meet their needs they turned to some other laborious work which they were not habituated to do.

**Papa :** Additionally, urban, industrialized areas were unable to keep pace with the flow of arriving workers from the countryside, resulting in inadequate, overcrowded housing and polluted, unsanitary living conditions in which disease was rampant.

**Devi :** Oh...No! So many problems... James Watt and company should have given a serious thought on these consequences before doing all this business!

**Papa :** (Laughs) It was not the fault of James Watt or any other scientist. Industrial revolution and growth of industries were essential.

**Devi :** Why?

**Papa :** It's because of increasing population!

**Chandra :** Population?

**Papa :** Yes! Continuous increase in population with increasing rate causes increase in demands.

**Chandra :** And to cater these demands, we need to increase production!

- Papa :** There you are! Using manual processes and traditional manufacturing methods we cannot increase rate of production beyond certain extent. So machines, automation.... all these things are necessary.
- Dadi :** Ok, but the product that we get by manufacturing through machine does not have that quality which we get when it is done manually by a skilled person.
- Chandra :** Means?
- Dadi :** *Aare gas pe pakaye gaye khane ko chulhe pe pakaye gaye khane ki maja nahi aati! Aaisa hi hai voh....*
- Papa :** (Laughs) This is also right!
- Devi :** Papa.... this is not fair!
- Papa :** What?
- Devi :** You are talking from both sides! (*Papa laughs*) Once you say that, industries are required and now are saying....
- Papa :** Beta, that is what one has to understand... a balance! With increasing population, demands have increased.... we have become more and more gadget addicts! All the time we need something new. Obviously, industrialization has increased with tremendous rate and since last few decades we are facing some serious problems of it.
- Devi :** Which serious problems, Papa?
- Papa :** There are two major problems of increasing industrialization... one is increase in environmental pollution and the other is excess stress on natural resources!
- Dadi :** That's correct. Modernization helped us to shift from *chulha* to gas cylinder, thereby decreasing pollution in homes; but pollution outside homes has increased horribly due to factories.
- Papa :** And it is more dangerous! The burning of fossil fuels led to a massive increase in urban air pollution, although most people felt that such a disadvantage was not significant in the context of their new found prosperity.

**Dadi :** May God bless them!

**Papa :** (Laughs) Even God cannot save us as our earth is in the clutches of evil of pollution.

**Chandra :** Yes, air pollution, water pollution, soil pollution.... I have learned it!

**Papa :** One has to strictly follow the laws and regulations regarding pollution and waste material management.... then only we can control the problem of pollution.

**Daid :** Yes! This is true!

**Papa :** In addition to pollution, other impacts of industrialization are also felt. There are drastic changes to land use with the construction of new buildings, including factories and houses for employees, and transport facilities, including new roads and rail tracks. Areas of countryside are being destroyed and replaced by industrial developments. Now, agricultural land use is reducing and it will drastically affect our food production.

**Chandra :** (In frustrating voice) Ohh, no!

**Papa :** There are some social issues also. For example, a person requires a lot of capital to buy machines and open a factory. Those who become successful, make huge profits with which they buy more machines, put up larger buildings, and purchase supplies in greater quantities.

**Chandra :** So rich becomes richer and poor becomes poorer! Am I right, Papa?

**Papa :** Yes, absolutely Chandra!

**Devi:** But Papa, you are talking about so many problems.... is there any solution?

**Papa :** Devi, to every problem, there is always a solution! Only thing is one has to think out of box!

**Devi :** Thinking out of box? Means?

**Papa :** Means some kind of innovation is required; either in the products or in the manufacturing process.

**Chandra :** Means we have to use solar energy instead of using electricity by conventional manner.

**Papa :** Yes. That is one way. Emphasis on the use of solar energy will reduce the burden on electricity demands...

**Dadi :** That will help us in reducing load shading of electricity!

**Papa :** Correct; and moreover use of solar energy will also reduce the use of fossil fuels, resulting drastic reduction in environmental pollution. People treat natural resources like fossil fuels as expendable income, when in fact these resources should be treated as capital, since they are not renewable, and thus subject to eventual depletion. It is necessary to use 'smart technologies' which will reduce pollution and help us to have production in minimum power requirements.

**Chandra :** Now a days, there is lot of discussion going on all around about carbon foot print and green house gas emission....our teacher told us!

**Papa :** Yes Chandra, we have to minimize carbon emissions. Every country in the world including us is thinking seriously on how carbon emissions can be reduced. Alternate technologies are being used for it. This may reduce the burden on environment, but to resolve social impacts different strategies should be employed.

**Chandra :** Which strategies, Papa?

**Papa :** Chandra, have you heard about the concept of 'cilage'? (सिलेज)

**Chandra :** Cila...ge... no!

**Papa :** Ok, I will explain to you. 'Cilage' means 'city in a village'!

**Devi :** Wow! What an idea!

**Papa :** Devi, this is not just an idea. The concept of cilage was introduced by the renowned scientist Dr. Anil Kakodkar. According to him all the necessities of the village should get fulfilled in the village itself, and if not then villages in a cluster should come together to fulfill each other's needs.

**Dadi :** This is great! In fact Mahatma Gandhi gave us the thought that, instead of migrating to cities from villages, we must develop opportunities in the village itself.

**Papa :** In fact, we have thousands of people from rural part of India who turned into entrepreneurs. I have a movie clip in my mobile. Do you want to see it?

**Devi and Chandra :** Ye...ssss!

**Papa :** Ok. I will show you.

*(Papa takes out his mobile phone and starts the movie clip. A female voice of narrator is heard)*

**Narrator :** This is the story of Mansukhbhai Prajapati, a traditional clay craftsman, who has developed an entire range of earthen products for daily use in the kitchen. These products include water filters, refrigerators, hot plates, cooker, non-stick *tava* and other such items of daily use.

**Dadi :** Wah...*Bahot aachhe!*

**Narrator :** His family was struggling with finances. Having gained a sound knowledge while working in the pottery unit, the desire to start an enterprise of his own started to grow in Mansukhbhai's mind. He took a loan of Rs 30,000 from a money lender to start his own manufacturing factory. Unlike most of the potters, Mansukhbhai is innovative. He started producing a large variety of kitchen utensils made from the soil. Of course, it took many years for Mansukhbhai to do experimentation and research on the manufacturing process, but he has a patience and creative mind.

Now many of the utensils he manufactures are being exported to various countries....Many of his products are patented.

*(Music Piece, Movie clip ends)*

**Chandra :** Wow Papa, what an achievement! Great!

**Papa :** Chandra, there are so many such examples. Chintakindi Mallesham is weaver in a small village of handloom weavers, Sharjipet. It is a village in Nalgonda district in Andhra Pradesh. He has mechanized the process of weaving of Pochampalli silk saree. Manufacturing of this saree requires a hand winding process of yarn before

weaving various patterns on the loom in the traditional “tie & dye” process. This is a very tedious and cumbersome process involving about nine thousand to and fro movements of hands for each saree. Obviously, this causes tremendous pain in shoulders and elbow joints.

**Devi :** Then?

**Papa :** Chintakindi Mallesham has mechanized entire process by modifying the traditional machine and thus has relieved hundreds of women from the drudgery of manual processes of weaving.

**Dadi :** These are real heroes of today’s world!

**Papa :** One more amazing example!

**Devi :** Amazing?

**Papa :** Yes! M. Nagarajan lives at Usilampatti, a small village 40 km away from Madurai in Tamil Nadu. He has developed a machine which can peel garlic. The machine has a capacity to peel 200 kilogram of garlic per hour.

**Dadi :** This is very much useful. Peeling garlic is a tiresome job for us.

**Papa :** And more importantly, the garlic cloves do not get cut when they are peeled by the machine.

**Dadi :** Really amazing!

**Papa :** M. Nagarajan has also developed lemon cutting machine. The cutting capacity of this machine is 160 lemons per minute. Now Nagarajan is manufacturing three lemon- cutting machines a month or four to five garlic peeling machines with his small team of five people.

**Devi :** Papa, do you have movie clip of this machine in your mobile?

**Papa :** Yes! I will show you..... See this....

*(Music piece. Papa shows movie clip to Devi.)*

**Devi :** Wow, Papa.... this is really great!

**Chandra :** Yes! I was not knowing that such great innovators are there in our country... and that to in rural part!

**Papa :** Beta, we have a lot of talent in rural part of the country. Only thing is one has to explore and channelize it. Mahatma Gandhi had said, 'instead of mass production, we need production by the masses'! If we follow this, then probably we can even troubleshoot the social issues of industrialization as well.

**Chandra :** In that case, we don't require big industries to large extent... it will save our nature, resources, energy and eventually the national wealth. Am I right, Papa?

**Papa :** Yes! absolutely right! That's why it is said – 'Small is beautiful!'

**Devi :** Papa, we have understood all... what you have told. But I have a question to ask.

**Papa :** Go ahead Devi!

**Devi :** What can we do personally to all these issues you have talked about.... pollution, carbon emission, global warming, energy crisis....

**Papa :** Good question Devi. Now we have to change our life style deliberately not only for ourselves, but for the future of mankind on the earth.

**Devi :** Means?

**Papa :** Means... try to reduce electricity consumption. You have to switch off all the electrical gadgets which you are not using. To minimize energy requirements and to consume minimum resources, we have to change ourselves from '*use and throw*' culture. In single word, the use should be 'judicial'! Remember there is no come back.... no backward step!

**Chandra :** Yes Papa, we promise you to follow your words into practice!

**Devi :** Yes Papa....me too!

*(Music piece. Episode ends.)*

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