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**Necessity is the mother of invention – A case of rural entrepreneurship through ‘Laxmi asu’ machine for pochampally saris in India**

*Dr. Prageetha G Raju*

Associate professor, Symbiosis Law School, Hyderabad Campus (Symbiosis International (Deemed University) -Pune

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**Abstract**

Innovations are required to develop new products, services, markets, reduce costs, improve efficiency, productivity, performance, quality, etc. The power of innovation is to create social and economic transformation.

The present case is a depiction and interweaving of three things – necessity, mother, and invention. *That’s right!* The Laxmi Asu machine invented to weave Pochampally Saris by Mr. Chintakindi Malleshham, a resident of Nalgonda District of the present Telangana State. Prior to this new invention it would take 5-6 hours to make one sari with 5-6 saris a month; after the invention it takes 1.5 hour to make a sari and the productivity has gone up to 8-10 saris a month leading to reduced drudgery, increased productivity and better livelihood. This invention was born to relieve his mother, Laxmi from this painful drudgery.

This case is the story of an innovation by a rural entrepreneur that created a social and economic transformation and a financial revolution in the Pochampally handloom sector. The information presented is based on published sources.

*Keywords: Necessity, ‘Laxmi Asu’, Rural entrepreneurship*

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*Author email address: dr.prageetha@gmail.com*

## Introduction to the context for invention

*Necessity is the mother of invention – Plato*

Innovations are required to develop new products, services, markets, reduce costs, improve efficiency, productivity, performance, quality, and to foster employment. The power of innovation is its capacity to create social and economic transformation. J K Rowling<sup>1</sup> said, that “*Imagination is not only the uniquely human capacity to envision that which is not, and, therefore, the foundation of all invention and innovation. Imagination is arguably most transformative and revelatory; it is the power that enables us to empathize with humans whose experiences we have never shared.*”

Invention of ‘Laxmi Asu’, a machine that eases the suffering of Pochampally sari weavers is truly a depiction and interweaving of three things – necessity, mother, and invention. Prior to this new invention it would take 5-6 hours to make one sari with 5-6 saris a month; after the invention it takes 1.5 hour to make a sari and the productivity has gone up to 8-10 saris a month leading to reduced drudgery, increased productivity and better livelihood. The inventor is Mr. Chintakindi Mallesham (Mallesham), a school dropout from Nalgonda district of Telangana State with absolutely no knowledge about engineering or science except a dream to build an automated loom. The first machine was made in 1999, later, the same was changed to steel, also the speed of operation was marginally increased, and a provision for stopping the machine when the thread got cut was incorporated. This was the first machine to be sold.

Mallesham grew up witnessing his mother Laxmi go through unbearable shoulder pain while working on the *Asu*, but, was helpless. Since it was the family's traditional business, she had no option but to keep weaving saris, even if it meant enduring a lot of pain.

He wondered if there could be an alternative method for *Asu* that would mean a better living condition as well as less physical drudgery for his mother. If there is a power loom to replace manual loom, why cannot there be a mechanical device to alleviate his mother’s pain? This thought became the genesis of the ‘Laxmi Asu’ Machine.

### Asu – keeping the tradition alive

Most handloom saris are woven manually. Even today, patterns are woven thread by thread. Pochampally silk saris are no different. While one admires the intricate work put into these masterpieces, the process is often extremely taxing for weavers. *Asu* is a pre-loom activity in the tie-dye fashion. The traditional machine has an angular structure with multiple spindles. Before weaving these patterns on loom, hand winding process of yarn has to be pursued, called *Asu*. This process involves moving hand, over a space of one meter up and down around semi-circularly arranged pegs, **18000** times (9000 with

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<https://news.harvard.edu/gazette/story/2008/06/text-of-j-k-rowling-speech/><sup>1</sup>  
<https://news.harvard.edu/gazette/story/2008/06/text-of-j-k-rowling-speech/>

one hand), for one sari, demanding high concentration and accuracy coupled with good eyesight. On each peg, one has to wind four times before moving to the next peg. Each sari needs four to five hours of labour. Entire design on the saris is totally dependent on the *Asu* process. Traditionally, ladies of the family performed this activity. But it involves long hours and lot of physical effort leading to acute pain in shoulders, elbows, and wrists.



Source: <https://www.thebetterindia.com/wp-content/uploads/2017/01/Mother-Laxmi-with-old-Asu-tool.jpg>

### Pochampally silk sarees

Pochampally<sup>2</sup> is a renowned place in Telangana for *Ikat* tie-and-dye saris. Pochampally mandal is a census town<sup>3</sup> and is officially known as Bhoodan Pochampally with 100 village cluster with traditional looms; their patterns and designs are centuries-old. It has more than 10,000 weaving families in 100 villages and cooperative society which markets the fabric. They have traditional geometric patterns in *Ikat*<sup>4</sup> style of dyeing. It is the first traditional handicraft to receive the status of Geographical Indication<sup>5</sup> under textile category. Nearly, one lakh weavers in Telangana were benefitted by the Intellectual Property Right (Geographical Indication) to the traditional tie and dye practice of the fabric from unfair competition and counterfeit. *Ikat* technique was brought to

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<sup>2</sup> <http://tstdc.in/pochampally/> Bhoodan Pochampally is a mandal of Nalgonda district of erstwhile Andhra Pradesh State and present Telangana state of south India and is known as the silk city. It is famous for its *Ikat* style of sarees and material. It is the result of Bhoodan movement of Acharya Vinobha Bhave (1951) where in land was donated by the then Zamindars, for community welfare. Hence, the name Bhoodan Pochampally.

<sup>3</sup> "District Census Handbook - Nalgonda" . *Census of India*. p. 13,248. Retrieved 11 February 2017.

<sup>4</sup> <http://pochampally.com/ikat-weaving-process.html> ; *Ikat* means to bind. It is an ancient way of creating designs in fabric by resist-dyeing the threads before weaving. It is a fascinating technique that subtly intermingles pastel shades and brightly contrasting hues.

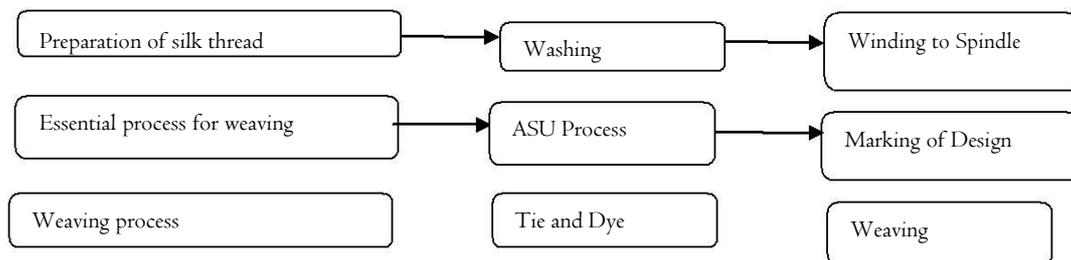
<sup>5</sup> <http://ipindia.nic.in/girindia> ; Geographical Indication of goods are defined as that aspect of industrial property which refer to the geographical indication referring to a country or a place situated as a country/place of origin of that product. Typically, such a name conveys an assurance of quality and distinctiveness.

Pochampally around 65 years back and each weaver is associated with tie and dye of *Ikat*. Today, Warangal and Nalgonda districts of Telangana States are involved in *Ikat*. Cabin crew of Air India<sup>6</sup> wear specially designed Pochampally silk saris. Pochampally found a place in the list of world heritage sites as iconic sari weaving clusters of in UNESCO<sup>7</sup>.

The weaving of Pochampally sari takes a good amount of time and energy causing lot of shoulder pain and eye strain. The process involves washing of silk thread which is then put on a spindle and *Asu* process is undertaken. Designs are marked on the triangular frame of thread forming during the *Asu* process. Tying and dyeing with requisite colors and shades is performed. The dyed thread is wound on the spindles and used on the loom as weft thread for weaving a sari. The *Asu* process is the most difficult and requires very high skill in the entire process of weaving. Weavers when create a sari manually, it takes them four hours to weave one sari, which means two saris each day. Enough concentration and good eyesight is the foremost requirement. Limited designs can be created and further weavers suffer from severe shoulder pains.

Bhoodan Pochampally came to limelight in 1999 when Mr. Mallesham developed a machine for automating the time consuming and agonizing *Asu* process of winding of yarn before dyeing and weaving.

**Figure 1: Process of weaving a Pochampally Sari**



**Source:** Sastry R Kalpana & Tara OK, (2014), "Rural Innovations @ Grassroots – Mining the minds of the masses", National Academy of Agricultural Research Management Hyderabad

### Motivation for inventing 'Laxmi Asu'

His mother, Laxmi, used to do the *Asu* for the saris woven by his father and him. In a day, at the maximum, she could do the *Asu* for two saris only, as it involved 18000 to and fro hand movements with thread set over 25 kilometers every single day to make just two saris. The work was repetitive and unyielding causing tremendous pain in her shoulders and elbow joints. She would often tell her son that she could not do this anymore. She also did not want his would be wife to go through the same ordeal and suggested him to look for other avenues. For untrained and less educated Mallesham, it was not easy. Also, doing *Asu* just for two saris per day was not enough to fetch sufficient income. This was

<sup>6</sup> "Pochampally silk sarees for AI airhostesses". The Hindu Business Line. Hyderabad, India. 2004-02-9. Retrieved 2018-01-13.

<sup>7</sup> <http://whc.unesco.org/en/tentativelists/5890/>

not the case with his family alone. Women of his community, the *Padmashali* community,<sup>8</sup> looked after their family, performed usual household chores and also worked for 8-9 hours to supply *Asu* material to their spouses for two to three saris per day for eking out a living. Mallesham grew up witnessing his mother Laxmi go through unbearable pain while making saris but was helpless. Since it was the family's traditional business, she had no option but to keep weaving saris, even if it meant enduring a lot of pain. There were instances when his mother wept of pain. He then wondered why cannot there be a mechanical device to alleviate his mother's pain. At the age of 20 years, in 1992, Mallesham started began his dream project. The idea of 'Laxmi *Asu*' Machine was thus born.

### **Laxmi *Asu* invention – challenges faced**

India is proud of its handloom saris. Their elegance and simplicity is simply unmatched. Most handloom saris, including Pochampalli saris are manually woven even to this day; the process is often extremely time consuming and physically strenuous to the weavers.

Mallesham was born in Sharjipet, in Nalgonda district Telanagana State to Chintakindi Laxminarain and Chintakindi Laxmi, into a family of weavers who weaved Pochampally saris. . There were around 10,000 families weaving these saris for generations using the traditional *Asu*. He could not see his mother's pain in shoulders, elbows due to *Asu*, and the condition of other women of the community was no different. He dropped out of school during eighth class in 1986 and joined the family business of weaving<sup>9</sup>. He lacked fundamental education, added to it, he had no understanding of engineering, mechanics, or science. He just did not know anything about machines except the manual *Asu*.

His sole motivation was to devise a mechanical device to alleviate the physical trauma of his mother. His lack of education, lack of education in engineering or science did not deter his motivation to come up with a power loom to help his mother and many other mothers of the community. He left to Hyderabad to learn about machines and their functioning, thus, he took a part time job to sustain self as well learn about automation of *Asu*. Earning, saving, spending on his project, he tried his best to build his dream. His trials failed many times. Since 1997, he started to look out for loans as all his savings evaporated and unfortunately, nobody gave him a loan as it is believed that weavers cannot repay loans as making ends meet is next to impossible for them. His family was fed up with his desire and warned him to stay away from useless dreams.

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<sup>8</sup> Mallesham belonged to Padmashali caste which is a community of weavers. Padmashali community members are traditionally weavers and Padmashali is a social categorization.

<sup>9</sup> [http://nif.org.in/innovation/laxmi\\_asu/9](http://nif.org.in/innovation/laxmi_asu/9)

Fellow weavers mocked at him thinking he is using his dream as an excuse to escape work. But, his perseverance was stronger. He was able to gather some machine parts from his part time employment but he had no clue about what to do with it. In February, 1999, one day, he began watching all the machines working in the workshop (where he was employed) and he was so fascinated that he was lost in observing them. His supervisor yelled at him to get back to work. In the course of observation, he found one machine running the way he wanted; he quit wages for the day and ran to a workshop to make a similar component, went home, and fixed it to the existing half-done *Asu*. Incidentally, the machine worked, he was super excited; he disassembled all of them, and went to his native home, and reassembled them and make it work. Surprisingly, it functioned better than the traditional *Asu*.

Finally, at that historic moment, he was able to develop the first prototype and he named it after his mother Laxmi – the ‘Laxmi *Asu*’. The first mode was made in 1999, at the age of 37, and it was mounted on a wooden frame and the first observation of its functioning was made. It was found that it worked better than the traditional *Asu*. The ‘Laxmi *Asu*’ was 60 inches long, 40 inches wide and 50 inches tall and is powered by two motors. The capacity was 250 watt.

Soon, the ‘Laxmi *Asu*’ was made of steel and some more electronic components were added to enhance the functionality; the design was also changed to accommodate the added functionality. This was the first machine that was sold. He sold 60 machines in 2001 and between 2002 and 2004 he sold 100 pieces each year. It cost 16000 INR then.

In 2005, an improvised version of ‘Laxmi *Asu*’ was born with more electronic components easing many more tasks. These changes resulted in almost 90 per cent noise reduction. The revised design also helped drastic reduction of electricity consumption. After that, in the next 3 years, he sold more than 300 enhanced machines. By 2011 he sold 600 machines<sup>10</sup>. The cost did not change as affordability amongst weavers would become an issue. Finally, with tears of joy he said, that no mother, including his mother would undergo gruesome ordeal anymore while weaving<sup>11</sup>. The innovation was recognized by National Innovation Foundation – India<sup>12</sup>.

Over the years, many improvisations came into the design of the machine and for this he learnt computers programming in order to automate the machine further; he learnt English and he purchased dictionaries to understand difficult words. This news was covered by Telugu daily newspaper “EENADU” in 2001 and thereafter there were floods of offers inviting him to demonstrate and explain it at various platforms followed by felicitations and awards, including the *Padmashri*<sup>13</sup> in 2017.

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<sup>10</sup> <https://www.thebetterindia.com/2564/grassroots-innovation-laxmi-asu-machine/>

<sup>11</sup> <http://www.thehindu.com/life-and-style/Man-and-his-machine/article15448245.ece>

<sup>12</sup> [http://nif.org.in/innovation/laxmi\\_asu/9](http://nif.org.in/innovation/laxmi_asu/9); Retrieved in October 2017

<sup>13</sup> <http://www.thehindu.com/society/Material-benefit/article17192800.ece>

‘Laxmi Asu’ machine is a revolution to the weaving community; it is a ray of hope to those who left weaving because of the pain and drudgery; it helps weavers to weave one sari in just one and a half hours (90 minutes). He asserts that weavers do not know any other vocational activity except weaving and this invention can make enhance their livelihood and make lives painless. Now weavers can make 8 saris each day; earlier, they could weave 6-8 saris a month. Wide varieties of designs can be made with very low electricity cost for each sari. Rich weavers purchased more machines and gave it to less rich weavers for a livelihood. The machine that he has invented automates the process of pattern making for the sari (called the ASU process).

Now, Mallesham is 44 years old and he set up Shankar Engineering Works which makes Laxmi *Asu* machines. The NGO Palle Srujana<sup>14</sup> has been extensively promoting *Asu* machines in Telangana. This NGO helped Mallesham in crowd funding to subsidize the cost of machine. The present cost of the machine is 25000 INR. Palle Srujana believes that rural innovators harness knowledge from the livelihood they are into and thus they come up with simple, sustainable, user-friendly innovations and they are usually affordable. The government has recognised his efforts. In 2009, the Laxmi *Asu* machine was recognized as the best grassroots innovation by the National Innovation Foundation and he was presented an award by the President of India. Mallesham also featured in Forbes magazine's list of seven most powerful rural Indian entrepreneurs. Last year his efforts were recognized by the government again when he received the Amazing Indians Award 2016 by Prime Minister Narendra Modi<sup>15</sup>. Mallesham was conferred Padma Shri for his invention impacted 60 per cent of looms engaged in weaving Pochampalli saris.<sup>16</sup>

**Technical Configuration of the Laxmi Asu<sup>17</sup>:** The ‘Laxmi Asu’ consists of three main components - (a) micro controller, motor, (b) power transmission system, and (c) arrangement for switching over the yarn from one spoke to another. Mallesham produce two variants of ‘Laxmi Asu’ -1. Semi-automatic model with no micro controller but only mechanical control system 2. Automatic model having micro controller. Semi-automatic machine takes 6 hours while the automatic machine takes 1.5 hours for a sari. Electricity consumption per hour is just 1 unit and the manpower needed for operating the machine is just 1 person; 4 Limit Switches are used for the machine, which needs a replacement every 6 months.

<sup>14</sup><http://www.pallesrujana.org/aboutus.html>

<sup>15</sup>[http://www.huffingtonpost.in/2017/01/05/moved-by-his-mothers- plight-this-telangana-school-dropout-inven\\_a\\_21648173/](http://www.huffingtonpost.in/2017/01/05/moved-by-his-mothers- plight-this-telangana-school-dropout-inven_a_21648173/)

<sup>16</sup><https://www.outlookindia.com/newswire/story/president-pranab-mukherjee-confers-padma-awards/968104>

<sup>17</sup>[http://nif.org.in/innovation/laxmi\\_asu/9](http://nif.org.in/innovation/laxmi_asu/9)

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**Fig 2: The Laxmi Asu Machine**



Source: <http://www.thehindu.com/life-and-style/Man-and-his-machine/article15448245.ece>  
(Left: Mallesham demonstrating the working of 'Laxmi Asu' Machine)

### **Socio economic transformation**

Laxmi Asu came as a boon to the weavers and it was a revolution in Pochampally sari making for the machine consumed only 90 minutes to make one sari compared to 5 -6 hours of drudgery in the past; more so, it consumed very minimal electricity (1 -2 units) and it needed no attendant/supervision. The machine, called Laxmi Asu machine by Mallesham, has brought in a revolution in the weaver community with the women of the community. They were hitherto engaged in the manual *Asu* process, and now they are encroaching into the male bastion by learning to weave on looms like men<sup>18</sup>. 'Laxmi Asu' brought about lot of changes in the lives of women, men and girls of the weaving community. Women have time to carry on with the familial chores, girls and boys have time to go to school because the machine doesn't need supervision. The brutal ordeal is vanished and the machine is giving a new lease of life to the women weavers<sup>19</sup>. Some are undergoing computer aided textile designing after Laxmi Asu's arrival.

Single women began setting up 'Asu Machine Centers' to supply *Asu* to cotton sari weavers too. Lingamma, a resident of the Mallesham's village set up such a centre in 2001 in her house and earns Rs 300 per day and her condition has drastically improved. For instance, she purchased a new house, cleared loans, and got her

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<sup>18</sup> [http://www.business-standard.com/article/economy-policy/asu-machine-to-aid-weavers-of-tie-and-dye-sarees-108120201020\\_1.html](http://www.business-standard.com/article/economy-policy/asu-machine-to-aid-weavers-of-tie-and-dye-sarees-108120201020_1.html)

<sup>19</sup> <http://www.thehansindia.com/posts/index/Andhra-Pradesh/2017-03-08/Changing-the-lives-of-women-weavers/285409>

daughters educated in an Engineering College. The socio-economic revival of sari production took place with the arrival of the Laxmi *Asu* machine. With the sale of over 750 *Asu* machines, over 10,000 looms got work. Another example is by a woman, Akubathini Kavitha, from Warangal district who purchased Laxmi *Asu*. She said that she is relieved of hard work and also earning almost double than what it was earlier.

Mallesham has proved that being economically poor or educationally poor doesn't make anyone knowledge poor. The machine doesn't call for any human involvement, therefore 'Laxmi *Asu*' ensures that the weaver does not have any ill effects on health like shoulder pains or strained eye sight. The technology of 'Laxmi *Asu*' would augment the cause of elevating employment efforts and health of women living in the margins.<sup>20</sup>

Mallesham's goal is to make the machine available to every weaver of his community - rich and poor. But, he is not getting the capital to manufacture that many. The Telangana government initially promised to help but in the XI plan, but, it gave importance to medium sized power loom enterprises. Mallesham says, that "*I managed to liberate over 850 women in our Padmashali community, including my mother Laxmi, from shoulder pain and the drudgery of processing silk thread manually on the old ASU machines. Now I want others to benefit too and have taken to crowd-funding to help at least 20 weaver families*<sup>21</sup>".

However, despite the inventor being lauded for his contribution, Mallesham has not been able to get government help. Thus, Mallesham finally turned to crowd-funding through [www.fueladream.com](http://www.fueladream.com) but that wasn't helpful too. Finally, the push came in the form of a financial assistance package from the Telangana State government in December 2017. Mallesham got Rs. 1 crore from the government to set up a unit that manufactures such machines. The letter sanctioning the amount was presented by the Textiles Minister KT Rama Rao. Now with the government extending support, he hopes to meet the growing demand for the machines "The minister said that the government had extended the financial assistance to promote rural innovation.<sup>22</sup> The machines that shall be manufactured now shall be distributed to Pochampally weavers first and then as per demand the manufacturing shall take place for other weavers.

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<sup>20</sup> [http://www.business-standard.com/article/economy-policy/asu-machine-to-aid-weavers-of-tie-and-dye-sarees-108120201020\\_1.html](http://www.business-standard.com/article/economy-policy/asu-machine-to-aid-weavers-of-tie-and-dye-sarees-108120201020_1.html)

<sup>21</sup> <https://timesofindia.indiatimes.com/city/hyderabad/only-high-praise-no-financial-help-for-forbes-list-innovator/articleshow/56305921.cms>

<sup>22</sup> <http://www.newindianexpress.com/states/teelangana/2017/dec/06/teelangana-government-funds-padma-shri-winners-innovation-to-ease-weavers-burden-1719481.html>

**Conclusion:**

Chintakindi Mallesham, is a rural entrepreneur who being poor and uneducated and existed at the bottom of the economic pyramid proved that knowledge exists at the bottom. The 'Laxmi Asu' is a grassroots rural innovation. It carries the understanding of the problems of weaving community and has become an irreversible solution for the age old drudgery and pain of the weaving community. The innovation removed the major constraint of the Pochampally weaving industry where even unskilled workers could be employed to operate the machine. More time at hand, more time for women folk to handle household chores, 25% increase in sari production, enabling computer aided textile training, girls pursuing higher education because of enhanced livelihood are the major advantages of 'Laxmi Asu'. It is a status and pride symbol of Pochampally weavers. Necessity is always a mother of invention.

**Questions:**

1. What is the problem faced by the rural entrepreneur?
2. What are the traits of a rural entrepreneur?
3. What is the difference between rural entrepreneur and urban entrepreneur?
4. What is the context for rural entrepreneurship?