

# Paving New Pathways in Paddy Plantation

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## 1. About MAVIM

MAVIM stands for Mahila Arthik Vikas Mahamandal - the State Women's Development Corporation of the Government of Maharashtra. The name MAVIM is closely associated with the SHG movement in the state. Being a state nodal agency for the implementation of SHG centered programs, MAVIM, at present, works with women in 13000 villages in 278 blocks in all 34 rural districts of Maharashtra.

MAVIM has district level offices across the state that primarily functions as support units to strengthen community level structures developed by MAVIM with SHG members.

The three-tiered community structure has Self Help Group (SHG) as the base tier, Village Level Committee (VLC), a collective forum of all SHGs in a village, as the middle tier and Community Managed Resource Centers (CMRC), the federation forms the top tier.

In MAVIM's view, SHG is a vehicle for the social, economic and political empowerment of women. SHG is a group of 15-20 women living in vicinity, who regularly meet to save money and access loans from these savings. They are fundamental and autonomous units that enable its members to realize and nurture their strengths. Individual SHGs come together at village level as VLC, to expand the scope of their activities and also for mutual learning and effective negotiations with elected local governing bodies.

CMRC is a federation of around 150-200 SHGs in a cluster of twenty villages situated close to each other. CMRC is a registered formal body and functions under a governing body formed by drawing representatives from all VLCs in the CMRC area. CMRC extend support to SHGs by accessing external resources and opportunities. These responsibilities are executed by CMRC staff - CMRC manager, animator in-charge for livelihood and grassroots institution building and SHG motivators, *Sahayogini* among others.

Programs or business proposals are first considered at the CMRC level. If the CMRC decides to go ahead, it takes responsibility for execution of the program in its area. In the case of entrepreneurial activities, SHG members are free to decide whether to participate in an enterprise or not. CMRC

extends further training and support to the SHG members interested and willing to participate in coordination with MAVIM district office.

## 2. MAVIM's Approach

Rural women are usually hesitant to accept entrepreneurial activities that are new to them. However, they are willing to invest their resources in activities that they are familiar with. Therefore MAVIM seeks to explore business opportunities in areas they are already engaged in. Initiatives are taken in order to improve productivity and sustainability of such enterprises and available resources, either through technical support or by introducing changes in practices. MAVIM promotes enterprises that are not only economically beneficial but are also useful socially and environmentally.



MAVIM believes in community participation. It involves local community as a whole, even men while promoting women's initiatives. This helps to mitigate family or community resistance if any arises.

MAVIM also work in convergence with various government departments, which helps to access their schemes for the community. These government programs also include training, hand holding support incentives which help the women, with limited access to these Departments on their own.

MAVIM's approach for entrepreneurship development and its three-tier approach at grassroots level enables it to design programs around community needs and execute them with local participation. Introduction of SRI Technique to paddy cultivators in Chandrapur was one such initiative.

## 3. Chandrapur Context

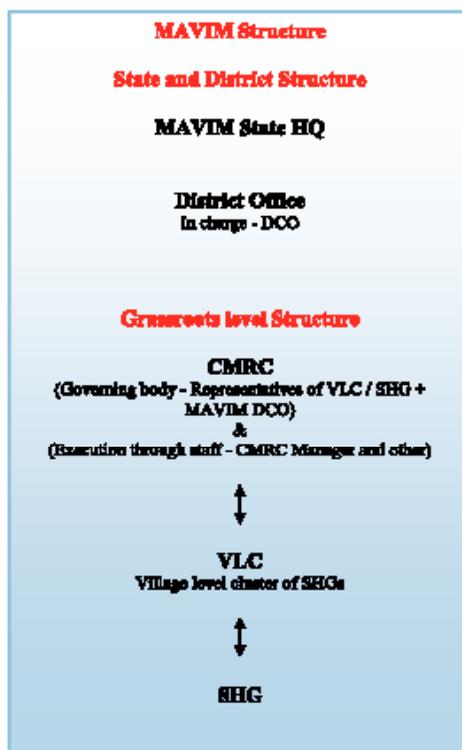
Chandrapur is located on the eastern edge of Maharashtra's Vidarbha region. For the last decade the region has been in national headlines due

to the agricultural crisis, leading to growing numbers of farmer's suicides. Unlike the other worst-hit districts in the region, which are mostly cotton growing, Chandrapur is a rice producing district. The district predominantly has tribal population. Over 30% of its area is under forest cover and 40% area under agriculture. The district is one of the highest rice producing districts in the state.

Although Chandrapur is not a crisis hit district, it has its own share of agricultural problems. The average land holdings are small; ranging from 3-6 acres per family. Also, the land quality differs from place to place. In villages nearer to forest areas, the quality of land is poor. The agriculture of the region is highly dependent on rice. To ensure a good yield, the farmer makes high investments in costly seeds, chemical fertilizers, and pesticides. The excess use of chemicals and hybrid seeds not only makes farming expensive but also results in degradation of the land. Input cost of cultivation goes up every year, but the output is uncertain. This dwindling agricultural economics is also reflected in the women's SHG accounts. Large portion of the loan, taken by the women SHG members, would be spent on paddy cultivation, but the returns on their investment were minimal and uncertain.

A study conducted by MAVIM, revealed a high rate of loan defaults among farmers. Women identified agriculture as their primary source of expenditure. It was also found that SHG-bank linkages were usually for crop loans. However, there were defaulters due to the uncertainty in climatic conditions and poor yields. Even though farmers took crop and kisan loans, not many availed crop insurance, despite a high dependence on nature.

MAVIM also observed that women were less involved in making agriculture-related decisions, even when they toil in the farms. Women performed labour intensive activities, such as planting and weeding, which required them to bend and work for long hours in the field. This caused considerable amount of drudgery for women who had the added responsibilities of household work.



### **MAVIM's approach to women's entrepreneur activities –**

- Improve what they do already
- Look for social and environmental benefits
- Facilitate women's initiative, also ensure community participation
- Convergence with Government Departments

The harsh conditions of women cultivators in agriculture in particular and paddy plantations in general prompted MAVIM to explore alternatives to address multiple problems identified in Chandrapur in consultation with Department of Agriculture.

Search for a method that will help reduce input costs of cultivation, minimize women's drudgery and help revive land productivity, led MAVIM to SRI – System of Rice Intensification.

**SRI is known as an agro-ecological method for increasing productivity of rice by changing management of plants, soil, water and nutrients. This technique is proven most suitable to rain fed rice cultivation and is known to reduce the input costs drastically, apart from increased yields and ecological benefits.**

## **4. SRI Initiative**

The initiative was started in 2010-11 by MAVIM in partnership with Department of Agriculture. While MAVIM wanted to replace conventional cultivation practices for the benefit of farmers, the Department of Agriculture wanted to promote the technique through training and on-site support to develop demonstration plots.

After a series of meetings with women and an awareness drive, the CMRCs were able to convince a group of women to participate in developing demo plots by allocating a portion of their land. Community level meetings were also organized to inform them about the initiative. SHG level meetings helped women to convince their family members.

In the first round in October 2010, after meeting with 30 villages in 3 blocks, around 715 women received training and capacity building inputs on SRI on their respective plots.

SRI is a type of precision farming, which requires doing the right things, in the right place, in the right way, at the right time. If the steps are followed, results are assured. Hence training played a major role in preparing women mentally and otherwise.

Training began with classroom sessions, which were followed up by practical demonstrations. Theoretical classes prepared women participants mentally, while practical sessions equipped them with skills needed for each stage of cultivation. Practical helped them to internalize the necessary skills.

Practical sessions started with land and soil testing, to give the appropriate treatment to land before plantation and then covered each stage in the SRI cultivation process starting from formation of mat soil bed nursery, to land improvement through addition of organic matter, to spaced out plantation, preparing organic fertilizers and pesticides, mechanical de-weeding with cono-weeder and so on.

Table 1: New Practices Promoted on Demo Plots

<b>Land preparation</b>	<ul style="list-style-type: none"> <li>• Demo field was leveled</li> <li>• Land prepared by adding organic matter prior to cultivation</li> </ul>
<b>Nursery Management</b>	<ul style="list-style-type: none"> <li>• Through seed beds</li> </ul>
<b>Transplanting</b>	<ul style="list-style-type: none"> <li>• Seedlings planted when 10-12 days old, as planting of young seedlings prolongs the vegetative growth period and facilitates the production of maximum number of tillers</li> <li>• Plantation properly spaced out (25x25cm), by using rope for marking</li> </ul>
<b>Fertilizers</b>	<ul style="list-style-type: none"> <li>• Organic fertilizer and vermin compost used</li> <li>• Urea briquette was hand placed under the soil</li> </ul>
<b>Pesticides</b>	<ul style="list-style-type: none"> <li>• <i>Dashparni Ark</i>, organically made extract from local leaves of ten varieties was made and used for spraying</li> </ul>
<b>Weed management</b>	<ul style="list-style-type: none"> <li>• Cono-weeder used as it adds biomass to the soil.</li> </ul>

Women diligently developed their demo plots by following the process systematically.

The new method required the use of merely 3-5 kg seeds per one-acre plot, whereas 30-50 kg seeds were used in the traditional method. This created doubts in women's minds, but they were convinced once they saw the results.

After two months growth, when they compared the plants in demo plot with the traditionally cultivated crop, they saw much advanced and good growth, with more than 100 tillers per seedling in the field.

At this stage, the beneficiaries were taught to use the cono-weeder. With the cono-weeder, weeding could be carried out by only two people. In traditional method this is a tedious and back breaking work the women. The weeder works well if land is watered the previous day and the plant spacing is maintained.

The women were then trained in disease and pest management on the plot. Women were taught the technique of preparing organic pesticides with commonly available leaves. Some SHGs prepared this pesticide *dushparnee* collectively and still continue to do so.

Finally, after the harvest women were convinced after seeing the output. “The plants were so full of panicles that I could not chop them in one stroke,” shared one cultivator.

The technique was a game-changer in improving the productivity in the district. The results were impressive. The demo plots gave higher output with lesser input as compared to plots under traditional cultivation practice.

*Women in various stages of SRI cultivation - Nursery making, precise plantation, manure making and cono-weeder*



1: Preparing organic manure to develop land quality 2: At the ready mat seed bed, before plantation



3: Women cultivators with cono-weeder, sprayer and other agricultural tools



4: Precise plantation with rope measurements



5: Growing plants

#### 4.1 Cost-effectiveness of SRI

After the first harvest of demo plots, a comparative chart was prepared to assess cost benefit ratio in SRI and traditional method. Table 2 below compares the input costs in traditional vs. SRI method of cultivation.

Table 2: Comparison of input costs – Traditional vis-à-vis SRI

	Traditional method		SRI	
	Quantity	Cost (Rs.)	Quantity	Cost (Rs.)
<b>Seed</b>	30-50 kgs / acre @ Rs. 50 / kg	1500 - 2500	2.5-3 kgs/ acre @ Rs. 50 / kg	125-150
<b>Fertilizers</b>	4 bag DAP& Urea	2500 - 3000	Use of organic fertilizers (Zink Sulfate / rock phosphate)	1000
<b>Pesticides</b>	Chemical spray	2000	Organic spray	200
<b>Labor</b>	Paddy cultivation- 10 labor for 7 days	1500/- within 3 days.	5 labor for two days	500-700
<b>De-weeding</b>	10 labor expenses 5 to 7 days	2500	2 labor expenses within 3 days	300
<b>Tillers</b>	Up to 20 to 30	—	Up to 50 to 110	—
<b>Produce</b>	9 to 10 quintal	—	11 to 13 quintal	—
<b>Av. input cost</b>		10,000-12,000		4000-5000

As the table shows SRI technique resulted in more than fifty percent decrease in input costs as compared to traditional method of cultivation. It required less seeds and also minimized expense on chemical fertilizers and pesticides by replacing them with organic manures and bio-sprays. This shift from chemical fertilizers and pesticides to organic methods will help in achieving long term environmental benefits and revive the land productivity.

On an average, the productivity increased 2 quintals per acre. The rice cultivators usually sell the surplus rice, after they have stocked enough for household consumption and some portion is used as seeds for the next year. With higher productivity they had higher surplus for markets leading to higher incomes

## 4.2 Sustaining SRI cultivation

In its first year in 2010-11, SRI was piloted in three blocks - Pombhurna, Bhis and Chimur. Although it was well received by the women cultivators and they were convinced about the benefits of SRI, it was important that they continue to adopt SRI practices in the subsequent years. In the pilot phase,

the cultivators received incentives apart from training and on-site support by provision of quality seed UB, sprayers and organic fertilizers by Department of Agriculture, while MAVIM provided cono-weeders to cultivators. There were no such incentives for the second year.

With an aim to encourage women cultivators to take up SRI, CMRCs with support from MAVIM's district office organized awareness campaign like in the first year, starting three to four months prior to the plantation to build a positive environment amongst the cultivators. Department of Agriculture extended help whenever needed. Also, since the women were convinced about the benefits, they continued to cultivate their demo plot with SRI method. MAVIM also expanded the area to include new CMRCs from four other blocks - Talodhi, Mul, Chandrapur and Gondpipri.

Women cultivators continued to adopt SRI in the in the subsequent years. The following table shows increase in the number of participants. The number of blocks has increased from 3 to 7, with a corresponding increase in the number of villages from 15 to 35, in the last five years, during 2010-11 to 2015-16.

The total land under SRI technique increased from 485 acres in the first year to 1271 acres in the fifth year. Average land size under SRI cultivation has gone up from half an acre in the initial demonstration stage to an average of one acre now.

*Table 3: Year-wise Progress in Total Coverage under SRI Cultivation in Chandrapur*

<b>Year</b>	<b>No of Talukas</b>	<b>No. of Villages</b>	<b>No. of Women Cultivators</b>	<b>Land Cultivated</b>	<b>Total Paddy Production (Quintals)</b>
<b>2010-2011</b>	3	15	535	485	4887
<b>2011-2012</b>	7	29	941	914	10630
<b>2012-2013</b>	7	31	1034	1012	11863
<b>2013-2014</b>	7	33	1107	1110	12537
<b>2014-2015</b>	7	35	1166	1188	13316
<b>2015-2016</b>	7	35	1183	1271	15120

## **5. Economic and Social Impact**

### **5.1 Less Production Cost and More Produce for Sale**

As can be seen in Table 2, there is a reduction in the input and production cost which is the direct economic benefit to women. On an average there is an increase in income by Rs. 6000 to 7000. Besides, the women also earned more from the sale of increased produce which was 2 quintals per acre. With an average rate of Rs. 20/kg in the local market, one woman farmer earned approx. Rs. 4000 more because of increase in yield.

Thus, a family cultivating 2 acres of paddy under SRI on an average during Kharif season earns Rs. 20000 approx. more as result of reduced input cost and enhanced production.

The SRI yield was produced organically and its quality was better than that of other rice sold in the market. Yet the traders were not ready to pay the premium for organic rice. While there were no takers for hand pounded and organic rice locally, MAVIM helped the SHGs to sell their organic produce in outside markets, such as in agro-exhibitions organized in Nagpur and Chandrapur.

The exhibitions, organized every year, provide a platform to SHG products. Women get reasonable rates for their organic rice; Rs. 60 / kg on an average, which is three times the rate in local markets.

### **5.2 Drudgery Reduction**

Overall SRI technique has contributed to drudgery reduction for women. The SRI method advocates ensuring spacing between plants and plantation of less seedlings. The requirement of less seedlings reduces movement from nursery to the field. The introduction of cono-weeder has helped in reducing in the labour required for weeding of the entire field. This has helped in reducing the drudgery of women in paddy fields.

### **5.3 Environmental Benefits**

SRI ensures a shift from chemical-intensive farming to organic farming, which is environmentally beneficial and a sustainable approach to farming. It will revive the land productivity in the long run.

Uses of organic manure and bio-fertilizers are lowering the toxic content in the crops and the cultivators are getting better quality grain for consumption.

## 5.4 Social Impact

The social impact of SRI initiative cannot be undermined. Although the project is implemented with the initiative of women; men in the family were also involved in the process. Women's engagement in the initiative has led to their active participation in agricultural decision making thereby empowering them. Now they ensure proper usage of agricultural loans, crop insurance, as they feel more involved in the production process.

The SRI initiative has enhanced cluster level activities also strengthening the grassroots institutions. From pre-cultivation awareness campaign to marketing through exhibitions, CMRCs are active with the women and try to expand the cultivation area by motivating more women every year.

## 6. Problems and Challenges

Although the benefits of SRI cultivation are evident, there are problems and challenges in its expansion.

Women cultivators adopting the SRI feel convinced about the method and therefore the number has steadily increased since the launch of the initiative in 2010-11. However, they cultivate only a portion of their land - half to one acre - with this method and do not use the technique for their entire plot of land.

Why are they still balancing the new method with the old? Is it to mitigate the risk by following the conventional and corresponding resistance to shift to new practices? Or are there any external impediments? The challenges are both internal and external – pertaining to unpredictable climatic conditions and limited reach to market.

There is still a hesitation to completely shift to the new method of cultivation. Some women said the family members do not agree for a total change. When the women insist they are allowed to continue it on the demo plot area.

Another problem shared by women cultivators relates with the technique of SRI cultivation. There is a timetable to follow; the plantation is done when saplings are small, about 15-20 days old. Since the saplings are small, while planting them, land should be just wet and not too watery as in the case of traditional plants. This means rain should be timely, or the land should have an appropriate slope to drain the excess water. If the saplings are a little older, then they cannot be planted using SRI method. Therefore, when the climatic conditions are not suitable, women have to shift to traditional method.

Some women shared that plantation time is a busy time and it becomes hard to find labor for planting, which needs to be done in time, otherwise the seedlings outgrow. In this season labor is in demand. They are used to doing plantation using the traditional method and are reluctant to do spaced-out planting with rope measurements. Besides, women on their own, can plant only a small plot, since it is time-consuming to do it with rope measurements. More labor is needed, as two persons need to be engaged for holding the rope. It is challenging to mobilize skilled labour for SRI plantation.

Getting assured market for organic and hand pounded rice is also a challenge. As there are no takers locally, women have to sell it at a subsidized rate. A proper marketing system would help them get appropriate rates for their produce.

## **7. Way Ahead**

Considering the problems faced by women cultivators MAVIM has chalked out a plan of action.

MAVIM will develop a Micro Livelihood Plan around SRI cultivation, which will take care of post harvesting needs. Support systems and market avenues will be strengthened. Establishing storages, rice mills in the local area will provide employment opportunities and needed support services for rice producers.

MAVIM will also team up the cultivators at village and CMRC level so that they are able to plan some of the activities collectively. For instance, some groups can prepare the bio- fertilizer collectively saving time and developing a sense of support from group members. This can also be extended to other areas, like the plantation, which is a skilled and time-consuming work in SRI method. When there is a collective process, more market avenues also can be tapped, beyond the exhibitions and other platforms used at present.

The SRI initiative in Chandrapur shows the willingness of rural women to learn and adopt new agricultural techniques that will benefit them. However, it also brings forth the need for other support required in order to sustain and expand the practice. Training and learning inputs should be followed up with hand-holding. There should be encouragement and motivation till the technique is fully adopted. Also the market linkages need to be strengthened, so that cultivators are able to get the real value for their produce. As MAVIM's plan suggests, it is taking steps in the right direction.