

# KANTAR PUBLIC

## Impact assessment of integrated watershed management initiatives by JSW foundation

Study report

April, 2022



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# 1 Study background and methodology



# Background

**Project title:** Improving Rural Livelihoods through Integrated Watershed Management

**Background:** Watershed development is one of the popular approaches among development planners and agricultural scientists because it promises a win-win situation as far as natural resource conservation and agricultural productivity are concerned. In India, most watershed projects are implemented with the twin objectives of soil and water conservation and enhancing the livelihoods of the rural poor. JSW foundation has been implementing the integrated watershed management program in two of its plant locations in Vijaynagar (Karnataka) and Tarapur (Maharashtra) since 2014 and 2016 respectively.

**Goal:** The overall goal of this initiative is to sustainably increase agricultural productivity and improve the livelihoods of rural poor in vulnerable rainfed areas through integrated watershed management. The specific goal of this initiative is to increase agricultural productivity, improve rural livelihoods and achieve sustainable rural development in selected villages.

**Project Area:**

- Jawhar Block, Palghar District, Maharashtra
- Sandur Block, Bellari District, Karnataka

# Research objectives

The study aimed to understand the effectiveness of the integrated watershed management initiatives in improving the livelihoods of the community and enhancing their socio-economic well being.

Specific objectives of conducting the research were to-

1

Understand and measure the economic enhancement of the communities through implementation of the integrated watershed program.

2

Assess the impact of program in enhancing the conservation of soil and water resources.

3

Understand the impact of the program on improving the agricultural productivity.

4

Assess the self-sustenance of the initiatives by measuring the level of community ownership and engagement.

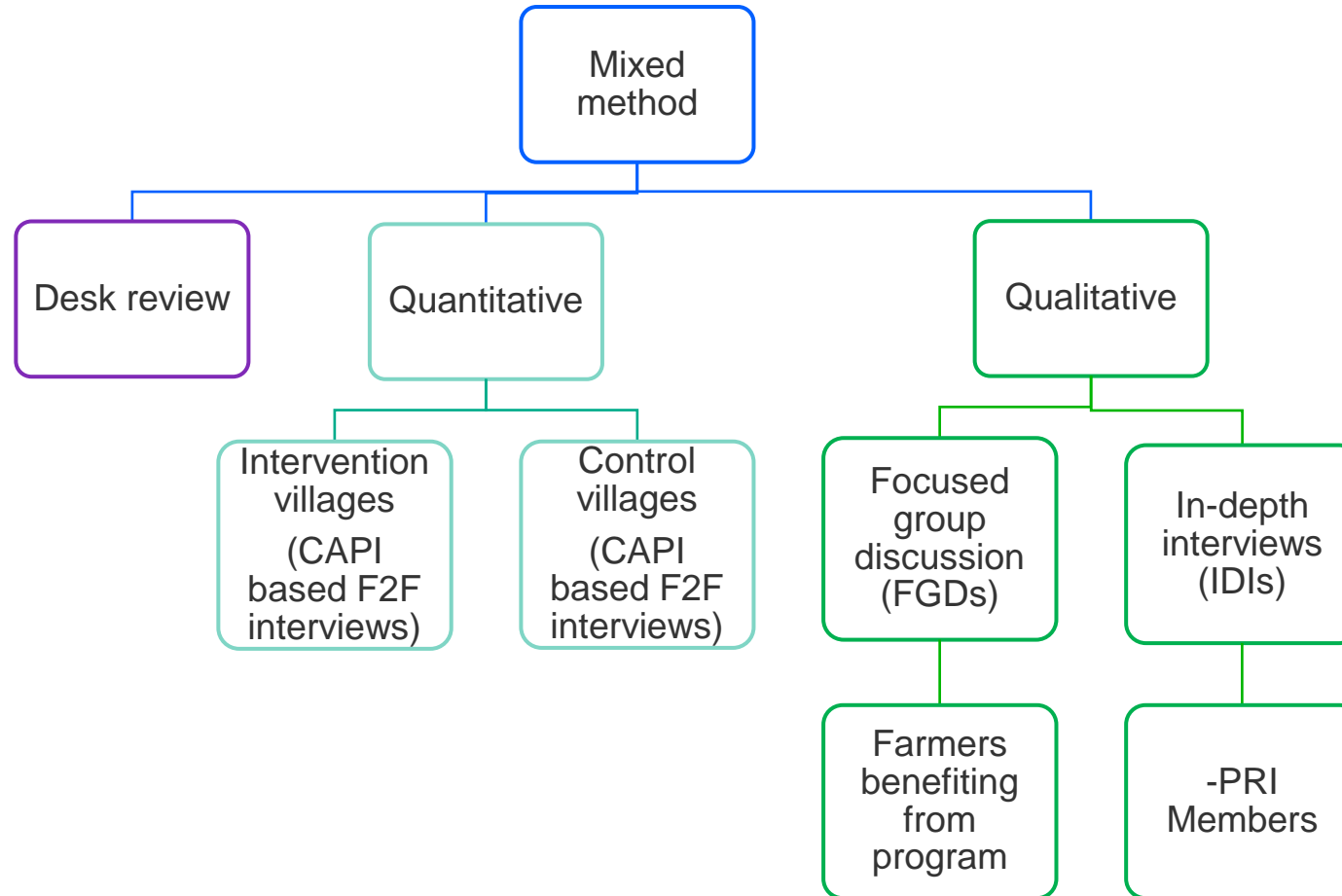
# Research framework

The following framework was used to guide the overall research and match the program inputs to intended impact.

Inputs		Outputs	Outcome	Impact
Integrated watershed management to improve livelihoods	Construction of soil and water conservation structures	<ul style="list-style-type: none"> <li>• Reduce soil erosion and improve water harvesting and water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Conservation of soil and water</li> <li>• Reduction in cultivable wasteland and increase in cultivable land</li> <li>• Increase in farm productivity and marketable crop yield</li> <li>• Increase in area brought under green cover</li> <li>• Reduction in crop failure</li> <li>• Increase in income through alternate livelihood</li> </ul>	<ul style="list-style-type: none"> <li>• Climate Resilience</li> <li>• Increased well-being</li> <li>• Reduced vulnerability</li> </ul>
	Farm productivity and livestock enhancement activities	<ul style="list-style-type: none"> <li>• Enhancement of land productivity</li> <li>• Promotion of alternate land use system and crop diversification</li> <li>• Facilitate off farm diversification of income</li> </ul>		
	Training and capacity building of SHGs and farmers	<ul style="list-style-type: none"> <li>• Capacitate the participating farmers on improved package of practices</li> <li>• Organize farmers to facilitate enhancement of value chain</li> </ul>		

# Research design

A mixed method quasi-experimental design was followed to evaluate the program impact, which included a desk review and primary research using both quantitative and qualitative data collection tools.



# Sample Distribution- Quantitative

## Quantitative sample size

For quantitative aspect of the study, sample size was calculated using the following formulae:

$$n = \frac{t^2 \times p(1-p)}{m^2} \times df$$

Where,

n = required sample size;

z = confidence level at 95% (standard value of 1.96)

p = estimated level of key indicators (assumed at 50% level)

Deff = design effect (considered at 1.3)

Based on the sample size formulae, the sample size for assessment considering non-response was arrived at:

Group	Maharashtra	Karnataka	Overall
Intervention	250	250	500
Control	250	250	500

### Target groups

**Intervention:** Households from villages benefitting from integrated watershed program.

**Control:** Households with similar socio-economic profiles to that of intervention villages

All respondents were the agriculture and livelihood related decision makers from the households.



## Sample Distribution- Qualitative

Target Group	Maharashtra		Karnataka	
	FGD	KII	FGD	KII
Farmers with land nearby to the project sites	3	-	2	-
SHG Members involved in the initiative	1	-	1	-
PRI Members	-	1	-	1
Activity-wise total	4	1	3	1
Total Activities			9	

**Selection of geography:** 3 intervention villages from Maharashtra and 2 intervention villages from Karnataka with highest water harvesting capacity and other initiatives were selected.

# Study geography and sample distribution

## Maharashtra



## Karnataka



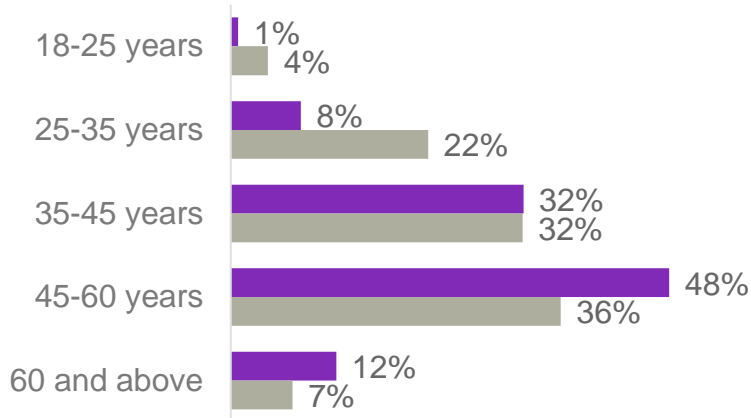
	Intervention villages	Quantitative sample covered	Qualitative activities covered	Control villages	Quantitative sample covered
Jawhar (District: Palghar)	Chambharshet	42	2	Pimpalshet	42
	Sakharshet	42	2	Vavar	42
	Dabheri	43	-	Sarsun	43
	Ghivanda	43	-	Dharampur	45
	Jamsar	48	-	Pimpalgaon	42
	Kogda	45	1	Poysket	44
Sandur (District: Bellary)	Chikanthapur	64	3	Thumthi	64
	Doddanthapur	60	-	Rajapur	63
	Joga	64	-	Shro Basapur	65
	Kodalu	61	1	Ubbalagundi	71
<b>Total</b>		<b>512</b>	<b>9</b>		<b>521</b>

# 2 Respondent profiles

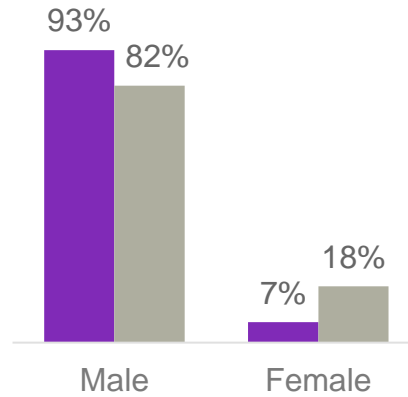


# Demographics of the respondents (1/2)

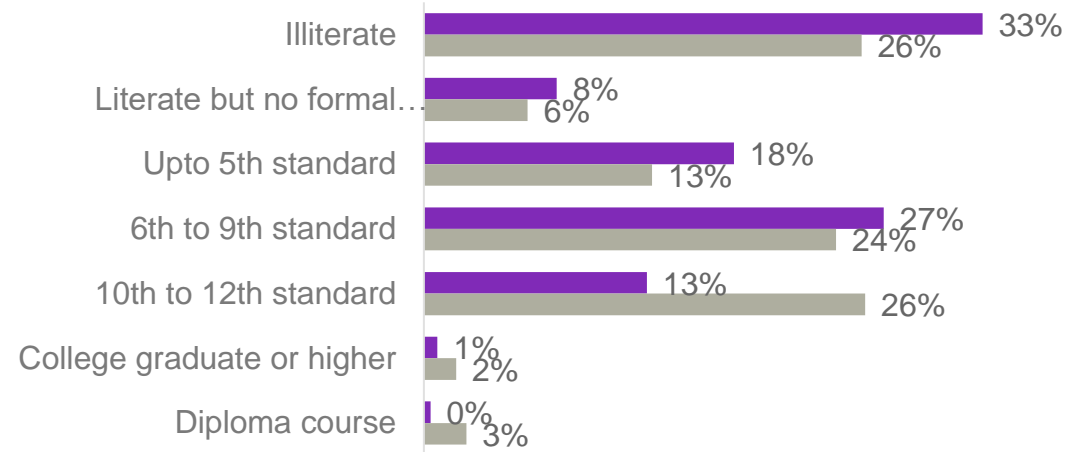
### Age of respondents



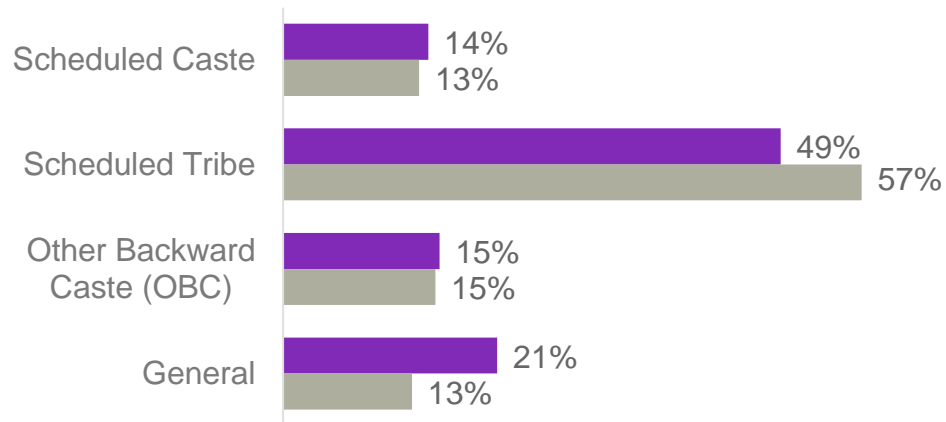
### Gender



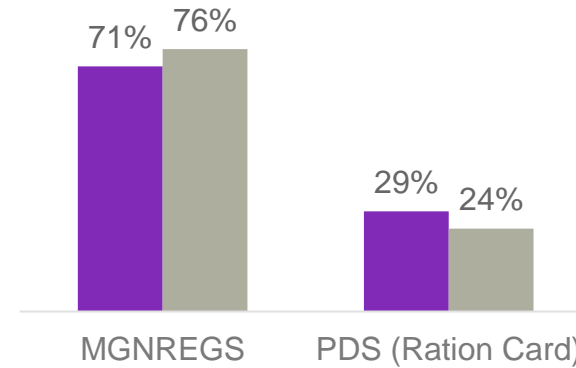
### Level of education



### Caste



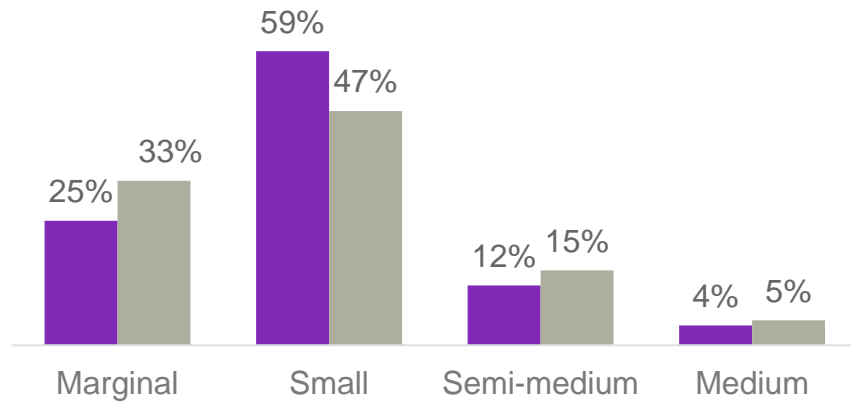
### Enrolment in social benefit programs



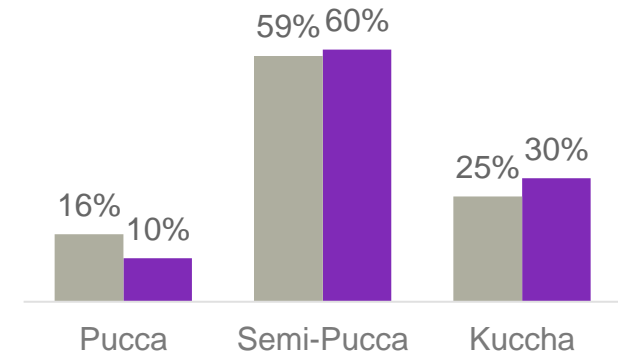
# Demographics of the respondents (2/2)

## Farmer categories

(classification based on Ministry of Agriculture and farmers welfare)



## Type of accommodation



Average land holding

1.65 Ha

In intervention villages

1.73 Ha

In Control villages

The average number of members per household were 5 in both intervention and control villages

3

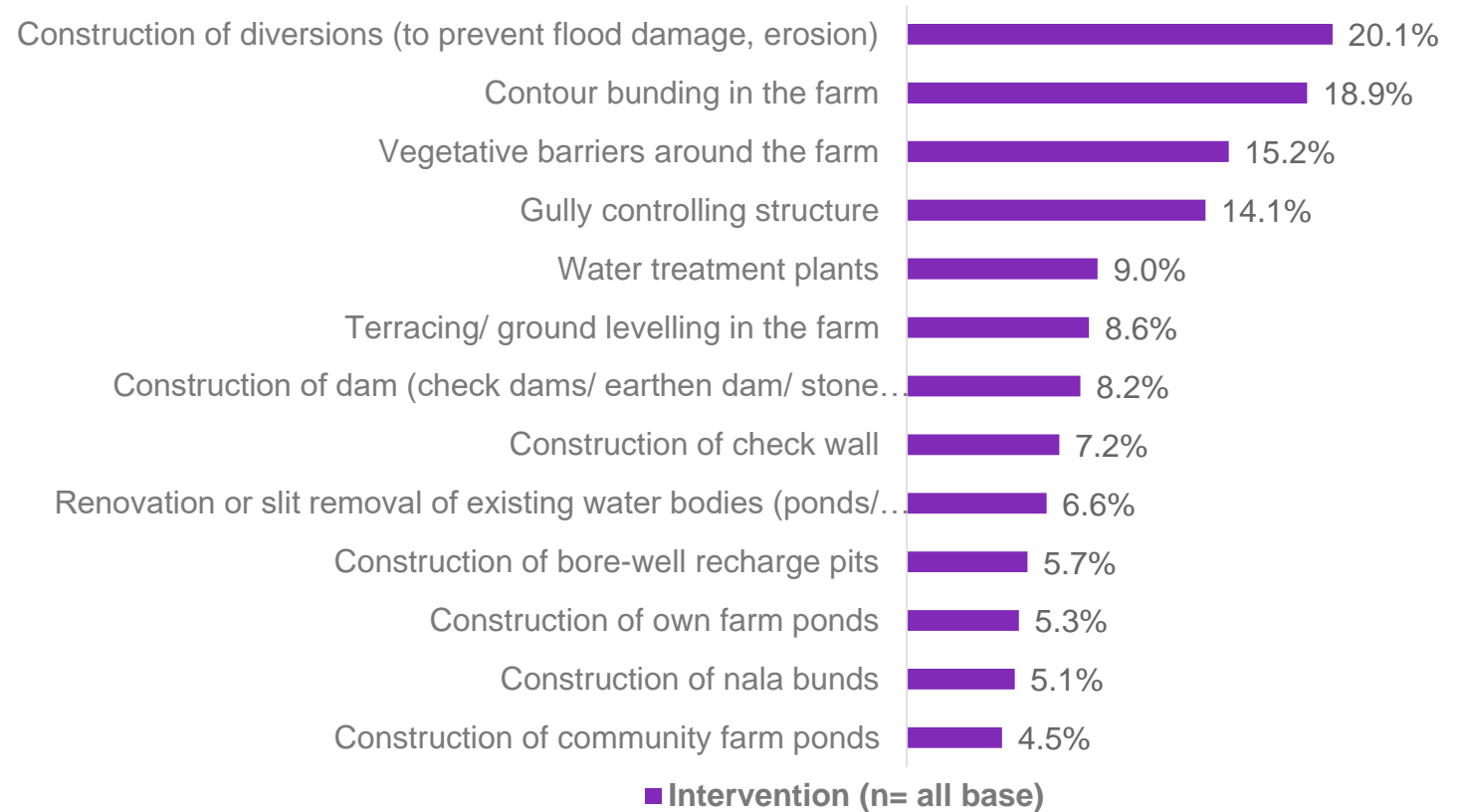
# Findings on program inputs



# Benefits of water structures/initiatives received by farmers under the integrated watershed development program

- Awareness and access around JSW initiatives was found to be high among the program beneficiaries in Bellary district, **84%** respondents reported to benefit from at least one watershed structure/initiative.
- In Palghar the awareness among beneficiaries was found to be very low, **90%** respondents could not recall to receive benefit from JSW's watershed structure/initiatives.
  - Reason for low recall in the region is the lack of direct association to the program among the beneficiaries.

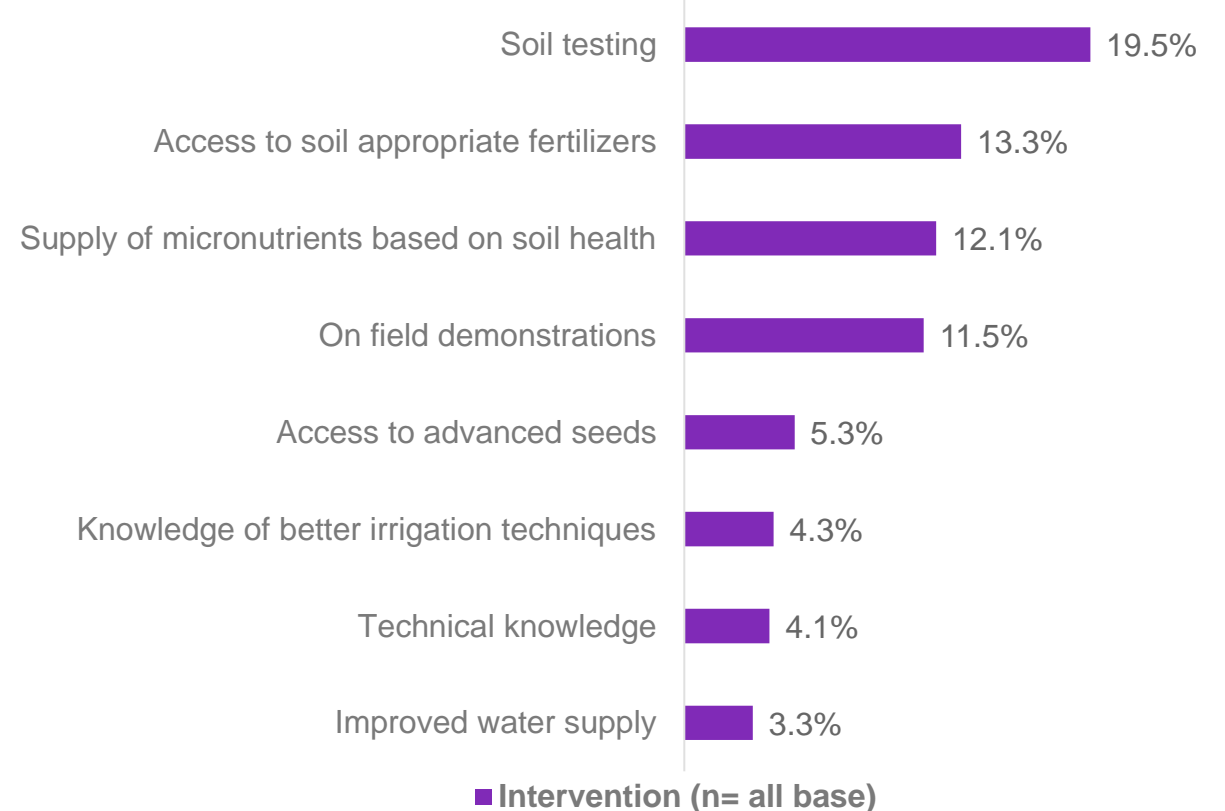
Respondents reporting to receive benefits of water structures/initiatives (multiple response)



# Benefits around improved agri-practices received by farmers to enhance their farm-productivity

- Exposure to initiatives aimed to enhance farm-productivity was also found to be higher among the program beneficiaries in Bellary district, **63%** respondents reported to avail at least one such benefit.
- In Palghar the exposure to these initiatives was reported quite low, **93%** respondents reported to not receive any of these benefits.
  - Though during qualitative discussions beneficiaries mentioned to avail benefits around seed subsidy, technical knowledge around fertilizer use etc.
  - Reason for low exposure/recall in the region is the lack of proper program orientation among the beneficiaries.

Respondents reporting to receive benefits to improve farm productivity (multiple response)





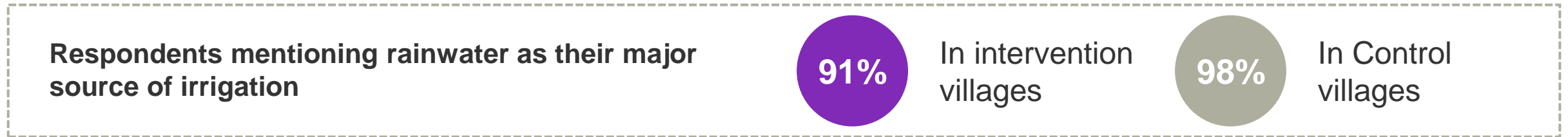
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# Findings on program outputs



# Availability of water for irrigation (1/2)

Majority of the study participants reported rainfall as their major source of irrigation for their farms, the dependency in control villages was found to be significantly higher than the intervention villages. A lower dependency on rainfall for irrigation indicates availability of water to cultivate multiple crops and reduced vulnerability to climate change.

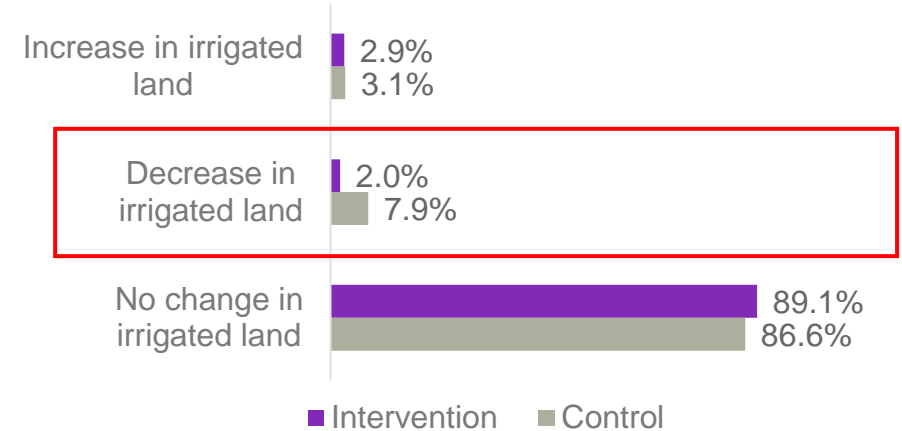


- In Bellari district farmers reported a lesser dependency on rain for irrigating their farms. Dependency in intervention villages was lower than the control villages.
  - **83%** farmers in intervention villages mentioned rain as the major source of irrigation, whereas in control villages **96%** mentioned the same.
  - In intervention villages other than rain, self-owned well, tube-well and farm pond were reported as other major sources of irrigation. Farmers also reported use of modern irrigation techniques- sprinkler (**16%**) and drip system (**16%**).
- In Palghar complete dependency on rain for irrigation was reported by the farmers in both intervention as well as control villages.
  - Owing to the hilly and rocky topography, surface run-off in the area is high, thus even after construction of water harvesting structures the beneficiaries reported that the benefits lasts only a few days or a month post monsoon.

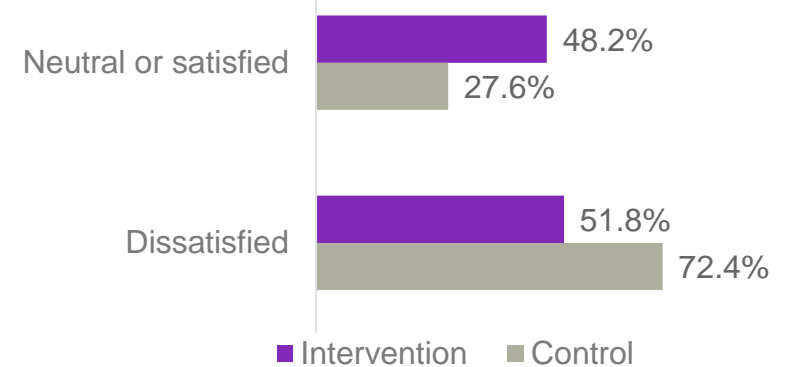
## Availability of water for irrigation (2/2)

- Majority of the respondents mentioned no change in area of irrigated land in last few years. However, a significant decline in irrigated land was reported in control villages when compared to intervention villages. Indicating the challenges faced by farmers due to lack of assured irrigation.
- Moreover, the dissatisfaction with the current irrigation arrangements was found to be significantly higher in the control villages.
  - Satisfaction levels in intervention villages in Bellari were reported quite high with a significant difference in opinions between the intervention and control villages. **87%** respondents in intervention villages mentioned to have a neutral or satisfied experience, whereas in control villages only **43%** respondents mentioned the same.
  - The satisfaction levels in Palghar were found to be lower with only **11%** respondents in intervention villages mentioning to have a neutral or satisfied experience. No significant differences in opinions were reported between the intervention and control villages.

### Change in irrigated land in last 3-4 years



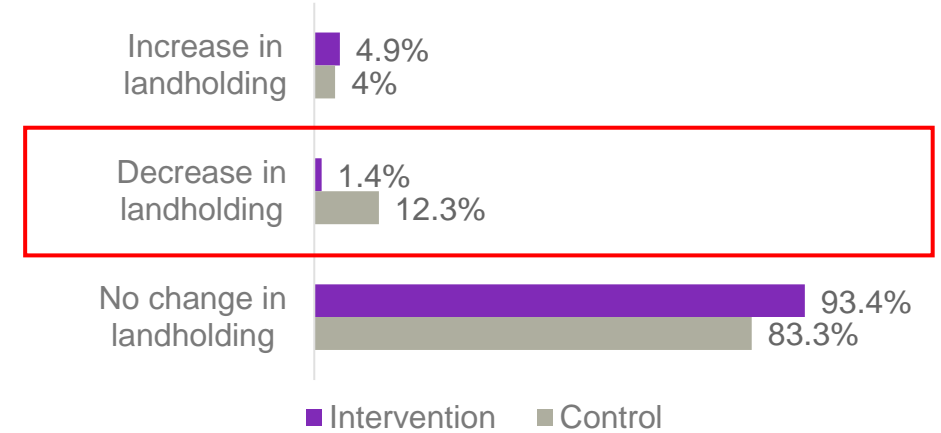
### Satisfaction with current irrigation arrangements



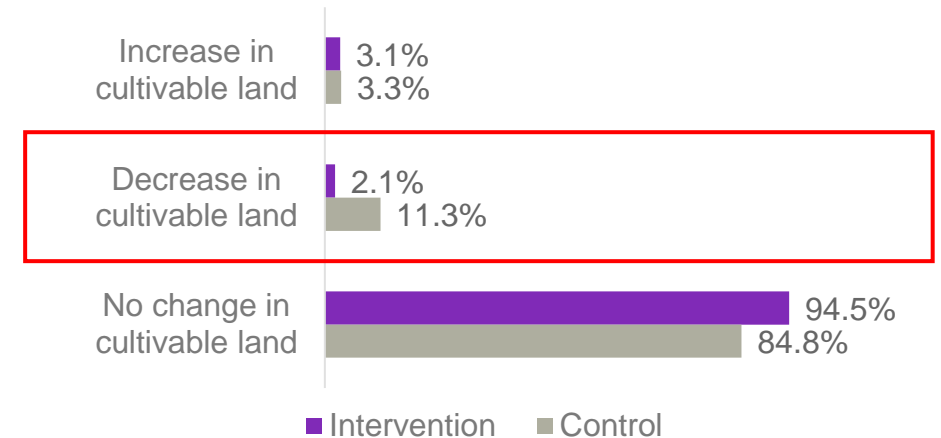
# Change in land use and agricultural productivity

- Owing to the challenges faced by farmers in the regions to carry out agriculture efficiently, a downward trend was observed in the size of landholding and agricultural practices among the respondents.
- Though no significant increase in landholding size was reported in intervention villages, a significantly higher decline in land holding size was reported in control villages. Similarly, no significant increase in cultivable land was reported in the intervention villages, but a significantly higher decline in cultivable land was reported in control villages.
- This indicates that the efforts of JSW foundation initiatives have helped to mitigate the agricultural challenges in the intervention villages to some extent and helped sustain agriculture as a viable option for the program beneficiaries.
- During qualitative interactions, a few beneficiaries in Bellary mentioned that the increase in water availability has resulted in an increase in agricultural practices and landholding among the program beneficiaries.

## Change in landholding in last 3-4 years



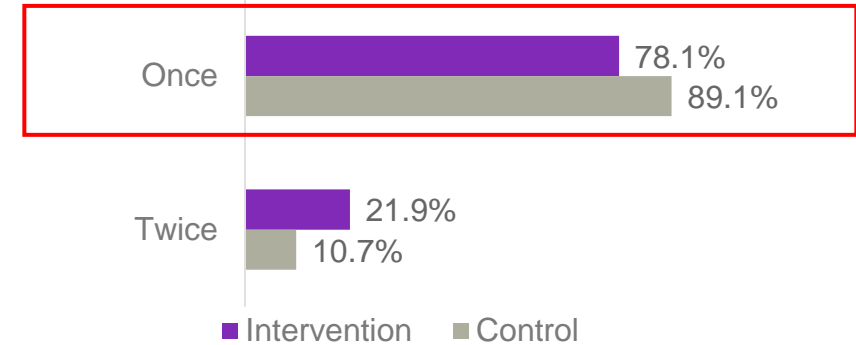
## Change in cultivable land in last 3-4 years



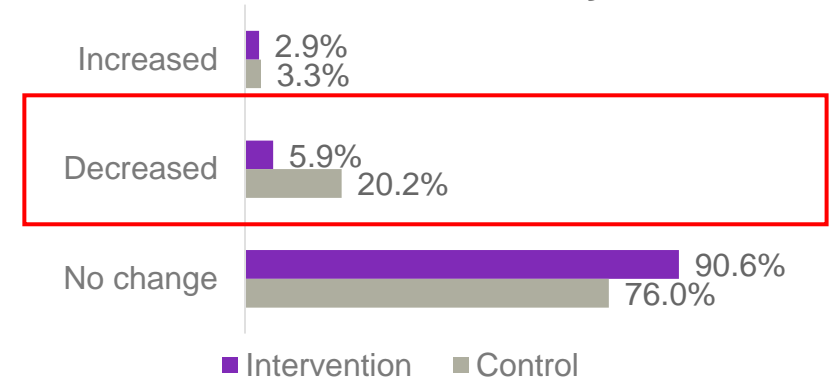
# Promotion of crop diversification (1/2)

- Majority of the respondents mentioned to take only one crop in a year. But the numbers of farmers taking a single crop was significantly higher in control villages when compared to the intervention villages.
- While assessing the change in the number of crops done by the respondents in last 3-4 years, majority of the respondents mentioned no change. But the numbers of farmers reporting a decline in the number of crops was significantly higher in control villages when compared to the intervention villages.
- This further underlines the decline in viability of agriculture in the region, but the negative impact of various challenges was mitigated in intervention villages to a certain extent through the initiatives of JSW foundation.

Number of times cropping done in the field in a year



Change in number of times cropping done in the field in last 3-4 years



## Promotion of crop diversification (2/2)

- In Bellari, there was a significant difference in number of crops cultivated between the intervention and control villages. **44%** respondents mentioned to take two crops in a year in intervention villages whereas only **21%** mentioned the same in control villages.
  - Farmers mentioned that the construction of water structures by the foundation and the training on modern irrigation techniques has helped increase the availability of water for irrigation, which in turn has enabled them to take multiple crops during the year.
- In Palghar, no change was observed between the intervention and control villages. In both the cases respondents had mentioned to take only a single crop in a year.
  - Owing to the extreme scarcity of water and high dependency on rainfall for irrigation, farmers in Palghar reported to undertake only subsistence farming.
  - Farmers who received training and support to cultivate other crops (like chilly, groundnut) mentioned to discontinue the practice post the exit of JSW program as they lacked market linkages to sell their produce.

“

*By agricultural pond and check dam Antarjal (ground water) will increase, before we had no water, but now after rainy season also we get water and agriculture has become better*

*- Farmer, FGD, Chikkaantapura*

”

“

*Before I was doing 5 acres of land but now, I have increased 10 more acres*

*- Farmer, FGD, Chikkaantapura*

”

“

*For any vegetable whether it is brinjal, chilly we don't have market here. The travel costs are un-affordable, it gets tough to sell any type of produce. This is kind of terrain region & roads are not good. That is why many people go out for work.*

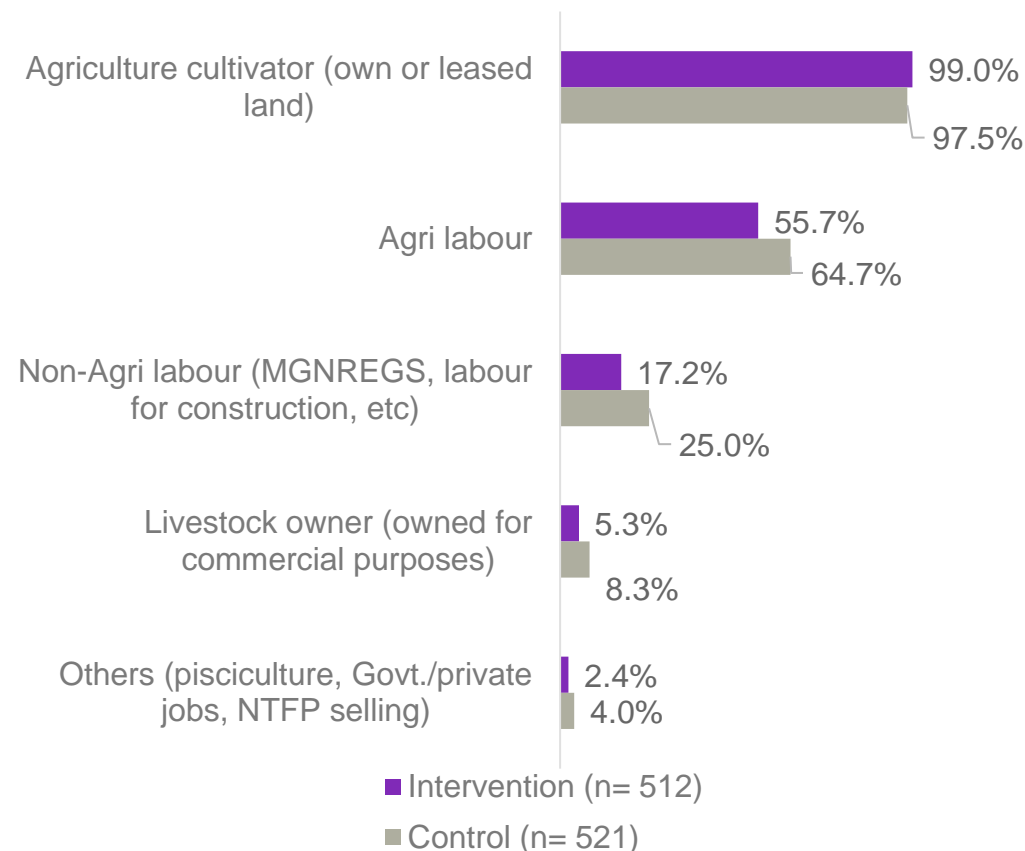
*- Farmer, FGD, Chambarshet*

”

## Diversification in income sources

- Recall/exposure to receiving trainings/support to enhance income through different livelihood activities was found to be extremely low among the program beneficiaries.
- 89%** respondents from the intervention villages mentioned that they or their family members did not receive any trainings or demonstrations on any income generating activities in the years after 2013.
- Engagement of beneficiaries in agri-allied activities such as animal rearing, pisciculture was also reported very low. Majority of the beneficiaries reported to have only draught animals.
  - Beneficiaries in Bellary mentioned increased engagement in factory work as the reason for decline in agri-allied activities.
  - In Palghar unavailability of water and fodder was quoted as the key reason for decline in these activities.

Livelihood activities respondents or their family members were engaged in  
(Multiple response)



# Trends in migration

Migration of family members in the household for livelihood purposes

37%

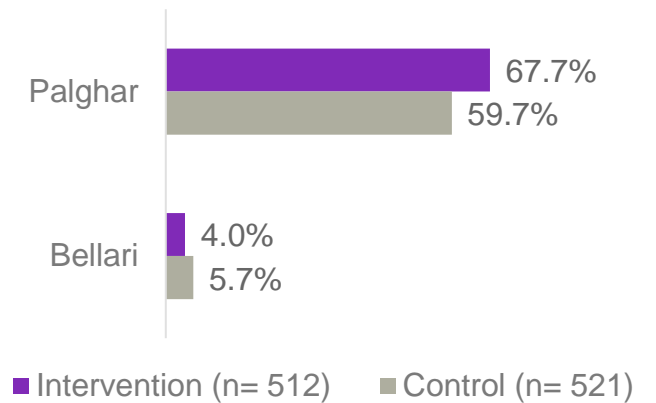
In intervention villages

32%

In Control villages

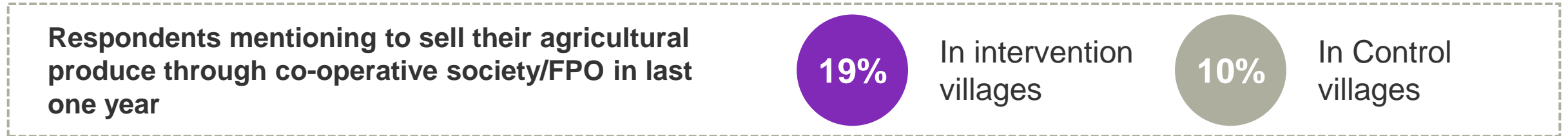
- Majority of the households in the region had members who were engaged in labour work in nearby factories or migrated to cities for work.
  - In Palghar instances of migration were reported to be very high, **68%** respondents from the intervention village mentioned migration of family members for livelihood purposes in a year.
  - In Bellary instances of migration to cities were reported to be low, only **4%** respondents from the intervention village mentioned migration of family members for livelihood purposes in a year. But the farmers expressed that at least one member in the family was engaged in work at the nearby factory, because dependency on agriculture as sole source of earning is risky.
- No significant differences in migration of people were observed between the intervention and control villages in both the districts.

Migration of family members in households

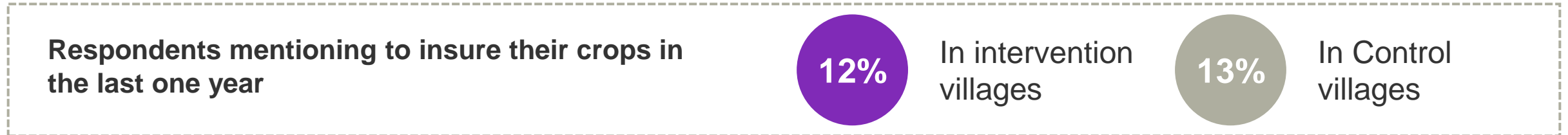




# Adoption of agri-value chain practices



Though at an overall levels the number of farmers selling their agricultural produces through co-operatives/FPO was found low in both intervention and control villages, the number of farmers availing the channel were found to be higher in intervention villages. Owing to the practice of subsistence farming, in Palghar none of the farmers reported to use any such channels.



At an overall level, the number of farmers availing crops insurance was found low in both intervention and control villages. With extreme climatic uncertainties in the region, crop insurance becomes a necessity but the knowledge around the same was found to be low among the respondents.

5

# Findings on program outcomes



# Change in income of households



Average annual household income reported by respondents

**INR 44,618**

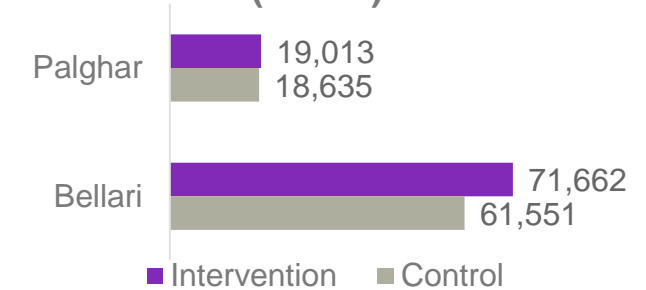
In intervention villages

**INR 40,299**

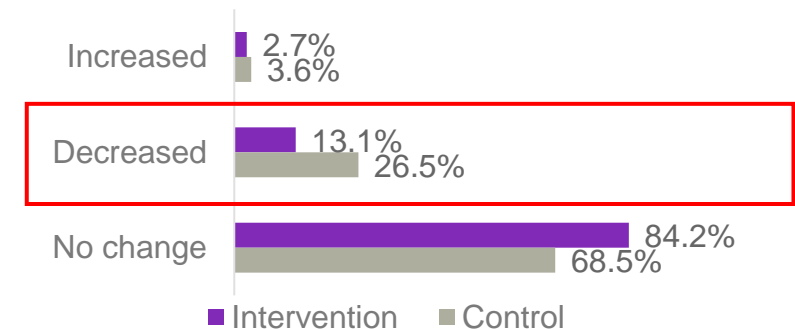
In Control villages

- The average annual income of the households in intervention villages was reported higher in intervention villages in comparison to the control villages. The difference was found to be statistically significant.
- Average annual agricultural income-
  - In Bellary, the average annual income among intervention households was reported 19% higher in comparison control villages. In intervention villages the average income reported was INR 34,346 while in control villages it was INR 28,796.
  - In Palghar, farmers mentioned to practice only subsistence farming hence no income from agriculture was reported.
- Though majority of the respondents did not mention any change in their savings in the last few years, respondents in intervention villages reported a significant decline in their savings when compared to the intervention villages. Decline in savings were mostly attributed to the increase in family sizes over years without substantial increase in incomes.

Average annual income of households (in INR)



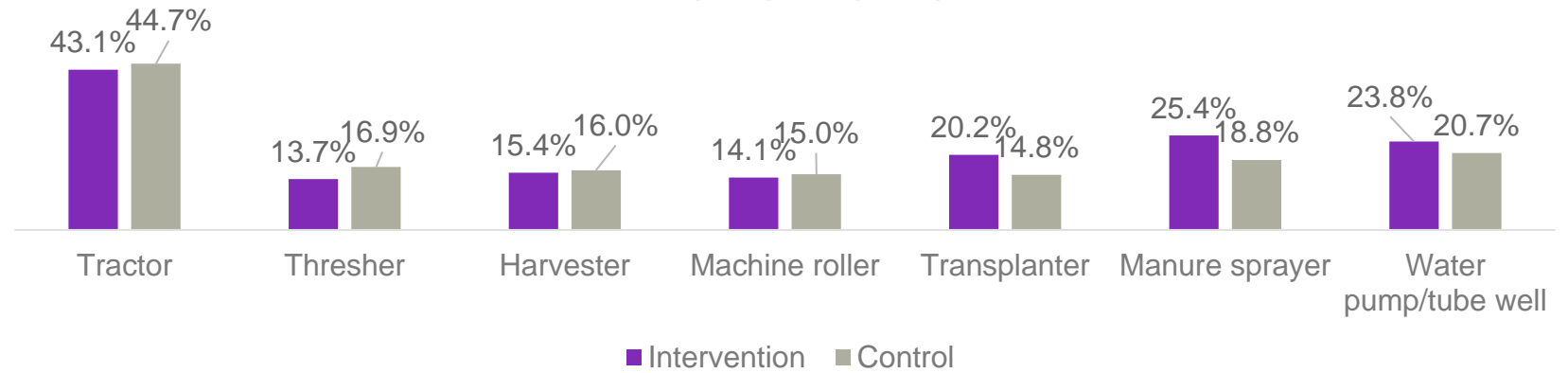
Change in savings in last 3-4 years



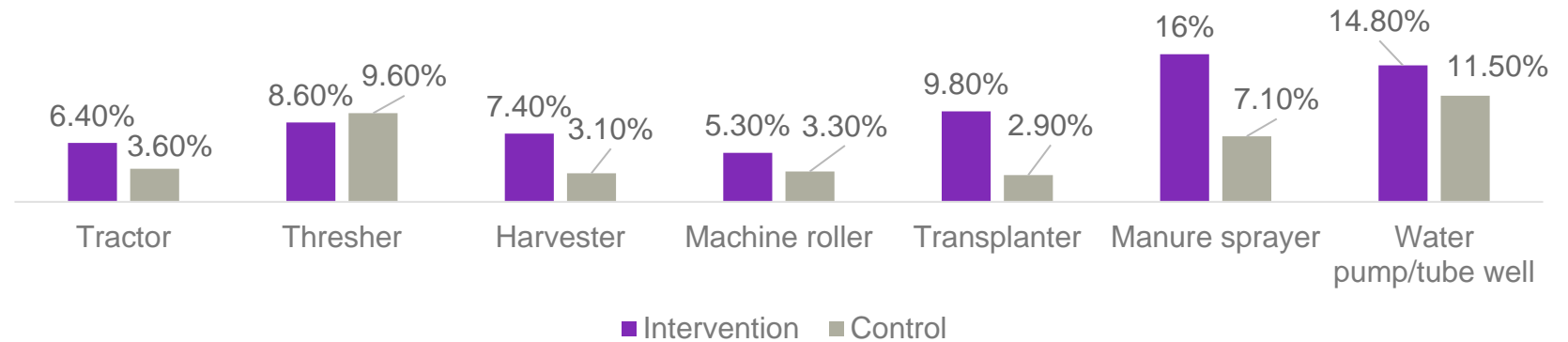
# Ownership and usage of farm machinery

- No significant differences were observed around the usage of farm equipment among the respondent in the intervention and control villages.
- Ownership of equipment was reported higher in intervention villages in comparison to control villages, indicating improved agricultural prospects.
- However, usage and ownership of these modern equipment was reported almost negligible by respondents in Palghar district, they mentioned to rely largely on traditional methods to practice agriculture.

Equipment usage among respondents (rented or self-owned)  
(Multiple response)



Equipment ownership among respondents  
(Multiple response)



6

# Key take-aways



# Overall understanding of study findings

1

## **Economic enhancement of the communities**

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Economic enhancement of beneficiaries was observed in the intervention villages, the average annual income of households was also found to be higher. Beneficiaries also expressed to bring improvement in their irrigation & agri-practices with the support of JSW foundation.

2

## **Enhancing the conservation of soil and water resources**

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Beneficiaries attributed that the construction of different water structures and training on water harvesting methods promoted towards the conservation of resources in the region. It also helped to reduce their dependency on rainfall to meet their irrigation needs.

3

## **Program impact on improving the agricultural productivity**

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Beneficiaries reported improvement in agricultural productivity with the support received from JSW foundation, the program outcomes were more pronounced in the Bellary district. In Palghar, the impact on agricultural productivity was reported low as beneficiaries mentioned to discontinue the improved agri-practices post the exit of intervention.

4

## **Self-sustenance of the initiatives and level of community ownership**

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Community ownership and engagement in the program was found to be low. Only 3% respondents mentioned to directly contribute for the maintenance of community-water related infrastructure in their area. Response towards self-sustenance of improved agri-practices was found to be moderate among farmers in Bellary, the same was found to be very low in Palghar.

# Beneficiary expectations and other considerations

## Need for better market linkages

Program beneficiaries expressed that the inaccessibility of markets to sell the produces discouraged them to take up new and diverse crops. Farmers and SHG members, especially in Palghar highlighted that a lot of their efforts get lost in the process of selling their produce as intervention of middlemen reduces their profit margins substantially.

## More practical demonstration over theoretical knowledge

Program beneficiaries expressed a preference for on-field demonstrations over theoretical training sessions. They also expressed need for financial support to execute the trainings around the improved practices (like input subsidies etc.).

## Continuous support and hand-holding

Beneficiaries mentioned that translation of trainings in to sustained practices requires continuous hand-holding and support as they face difficulties to carry out activities independently once the intervention is over.

## Points to consider...

Focus on community engagement should be increased and emphasis should be laid on addressing beneficiaries' resistance by bringing in behavior change exercises.

Training of the community on protocols for maintenance post program exit is essential.

Development of a protocol that would guide community members in long term upkeep and maintenance of structures and motivate them to stay invested will ensure sustainability of the programme.

# Thank you