

**Climate Smart  
Agriculture (CSA)  
Technology  
Farmer's Guide**



# **Direct Seeded Rice (DSR)**





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This training material was produced as a part of the project ‘Consortium for Scaling-up Climate Smart Agriculture in South Asia (C-SUCSeS)’, which is a joint initiative between the South Asian Association for Regional Cooperation (SAARC) Agriculture Centre (SAC), the International Food Policy Research Institute (IFPRI), the International Fund for Agricultural Development (IFAD) and SAARC Development Fund (SDF). The modules were reviewed and validated at the three-day [‘Training and Validation Workshop on Modules of Climate Smart Agriculture \(CSA\) Technologies in South Asia’](#) from April 22 to 24, 2024.

### **About the project**

<https://cop.sac.org.bd/about-c-suces/>

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### **Cover Image Source**

Title: Happy woman farmer in rice field  
Source/credit: Flickr/IRRI

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## What?

Direct Seeded Rice (DSR) is a modern way of growing rice where instead of transplanting seedlings, rice seeds are directly sown into the field. Rice production/establishment in the main field directly from seed instead of seedling. It involves planting seeds directly in the ground instead of starting with seedlings in a nursery leading to significant savings in cost, labor and water. DSR systems are also classified into dry-direct seeded rice, wet-direct seeded rice, and water seeded rice. **This module focuses on wet-direct seeded rice.**

## Why?

Farmers can switch to Direct Seeded Rice (DSR) because it saves water, reduces the need for hard labor, and cuts down on farming costs. It also helps protect the environment by lowering greenhouse gas emissions and conserving energy. With DSR, farmers can potentially increase their crop yields, adapt better to changing weather patterns, and harvest earlier, allowing for more timely planting of other crops. Also, DSR can work in different soil types and conditions, making it a practical choice for farmers dealing with various challenges.

### Saves Water, Time and Money

- DSR saves water by eliminating continuous field flooding, promoting sustainable farming in water-scarce regions.
- It reduces labor needs by removing the transplanting step, allowing farmers to use their time and resources more efficiently.
- It reduces farming costs, boosting profitability for farmers.
- . Properly managed DSR can enhance crop yields through better plant establishment, leading to higher productivity.



**Title:** Expert demonstrating machine in “Direct seeded rice field”

**Source/credit:** Flickr/IRRI

**Location:** India

## Where can you apply?

DSR can be implemented in various regions and conditions, including:

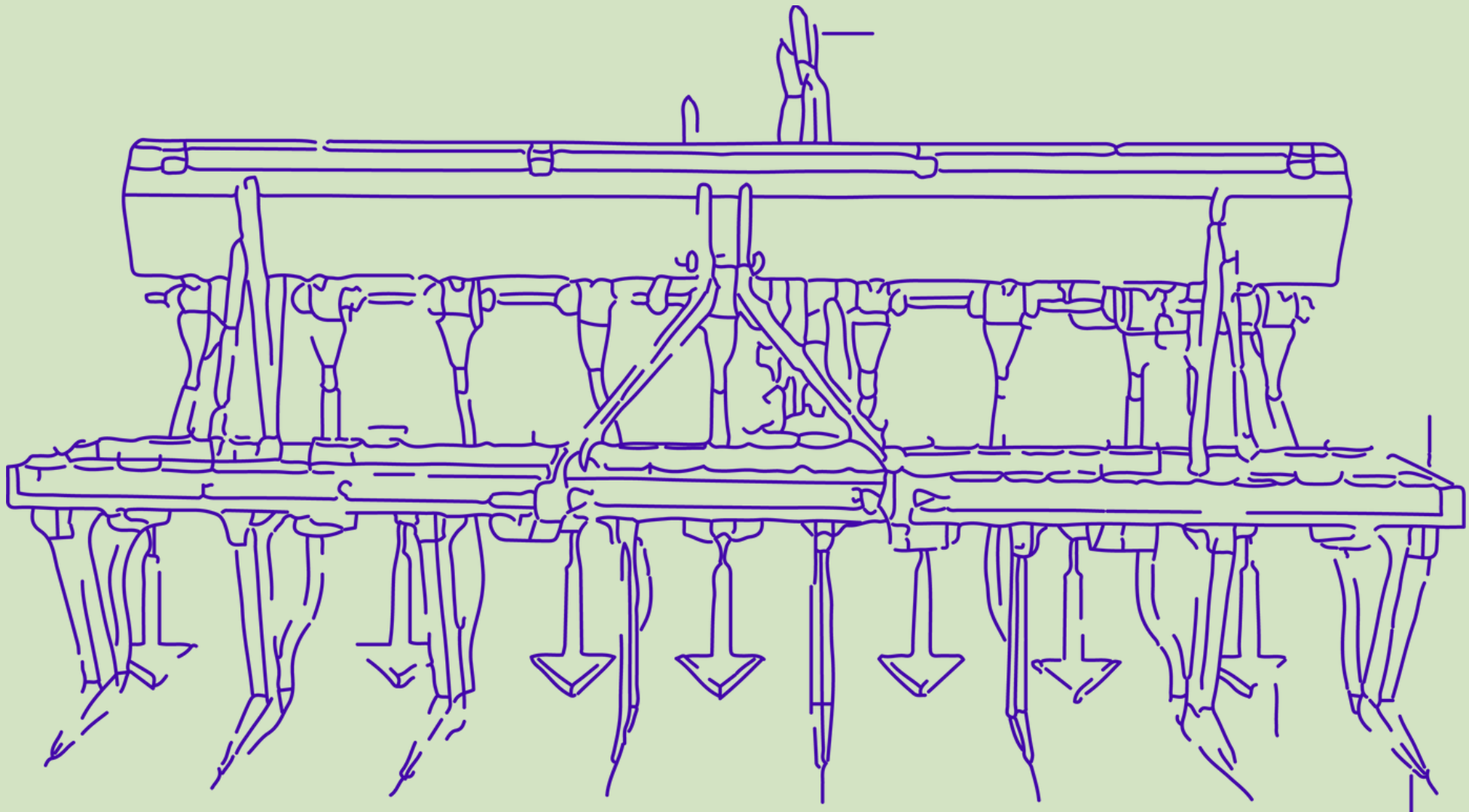
- **Areas with water scarcity:** DSR reduces water usage compared to traditional rice cultivation methods, making it suitable for regions facing water shortages or limited irrigation resources.
- **Regions with labor shortages:** Since DSR eliminates the labor-intensive process of transplanting seedlings, it is beneficial for areas experiencing labor shortages or high labor costs.
- **Diverse soil types:** DSR can be adapted to different soil types, including sandy, loamy, and clay soils, making it suitable for a wide range of agricultural landscapes.
- **Hilly or sloped terrain:** While flat land is ideal for DSR, it can also be implemented on sloped terrain with proper water management techniques to prevent soil erosion.
- **Areas with variable weather conditions:** DSR offers flexibility in planting timing and can adapt to unpredictable weather patterns, making it suitable for regions with variable climate conditions.



**Title:** Happy woman farmer in rice field

**Source/credit:** Flickr/IRRI

**Location:** India



## **DSR drill Machine**

DSR seed drill machine is used in dry direct seeded rice and a drum seeder is used in wet-direct seeded rice.

## Steps to implement DSR

- **Field Preparation:** Prepare the field by leveling and smoothing the surface to create an even seedbed. Remove any debris or obstacles that may interfere with planting operations.
- **Seed Selection and Treatment:** Choose high-quality rice seeds that are suitable for DSR. Treat the seeds with recommended fungicides to protect against soil-borne diseases and improve germination.
- **Seed Sowing:** Use seed drills or planters to sow rice seeds directly into the prepared field at the recommended seeding rate and depth. Ensure uniform seed placement and spacing to promote even crop establishment.
- **Weed Management:** Apply pre-emergence herbicides or implement other weed control measures to manage weed competition and maintain crop health. Regular monitoring and timely weed control are essential throughout the growing season.
- **Irrigation Management:** Provide adequate and timely irrigation to support seed germination and early crop growth. Monitor soil moisture levels and adjust irrigation practices as needed to optimize water use efficiency.
- **Fertilization:** Apply fertilizers according to soil nutrient requirements and crop growth stages. Split the fertilizer application into multiple doses to ensure proper nutrient availability throughout the growing season.
- **Pest Monitoring and Control:** Monitor the crop regularly for signs of pest infestation and implement appropriate pest control measures as needed. Integrated pest management strategies that combine cultural, biological, and chemical control methods are recommended.
- **Crop Monitoring and Management:** Regularly monitor the crop for signs of stress, nutrient deficiencies, or pest damage. Implement timely interventions to address any issues and ensure optimal crop growth and development.

## Suitable Crop

DSR works best for rice farming, as the name suggests. However, other crops like wheat, barley, maize, and millets can also be grown using this technique.

## Suitable Slopes

DSR is best suited for flat and/or slightly sloping terrain. Steep slopes might not be ideal as they can lead to soil erosion and water drainage issues.

## Suitable Soil

DSR can thrive in different soil types, but it performs exceptionally well in medium-textured soils. These soils offer good drainage and moisture retention, which are essential for successful DSR cultivation. However, DSR can also be adapted to other soil types with proper management practices.

## Suitable Irrigation Type

Adequate water availability is crucial for DSR, especially during the early stages of crop establishment. While DSR is known for its water-saving benefits compared to traditional rice cultivation methods, it still requires sufficient irrigation or rainfall. Rainfed areas with consistent and well-distributed rainfall can also support DSR cultivation effectively.



**Title:** Direct seeded rice field  
**Source/credit:** Anisha Mohan/IFPRI  
**Location:** Nepal



## Remember !

- Weeds and Pests: DSR means less digging, which allows more letweeds to grow. Also, pests might be more attracted to the crops when they are at a seedling-stage . Practicing integrated pest management methods will help protect the crop.
- Soil care: Planting rice in the same spot can exhaust nutrients in the soil. Planting alternating and cover crops will help preserve the soil quality and add more nutrients to it.
- Tools and training: DSR requires special tools like seed drills and initial training or advice on how to use it .

**Title:** Direct seeded rice field  
**Source/credit:** Anisha Mohan/IFPRI  
**Location:** Nepal

# Activity Time

## Activity 01 : Picture your farm

- Try drawing your farm (Need not be perfect) using simple lines, Curves or shapes.
- Try giving a name to your farm as you recognise it based on its size, location or may be based on directions it is facing.
- Write or draw crop names as plan.
- Try pasting a picture/photo if you are not willing to draw at all.

## Activity 03 : Evaluate CSA methods

- Try evaluating adopted CSA methods and keep a track over the year.
- Try keeping as per your real experience.
- Ask Facilitator to guide if you are not able to see significant impact on your farming practice.

**All activities would be performed with the help of facilitators.**

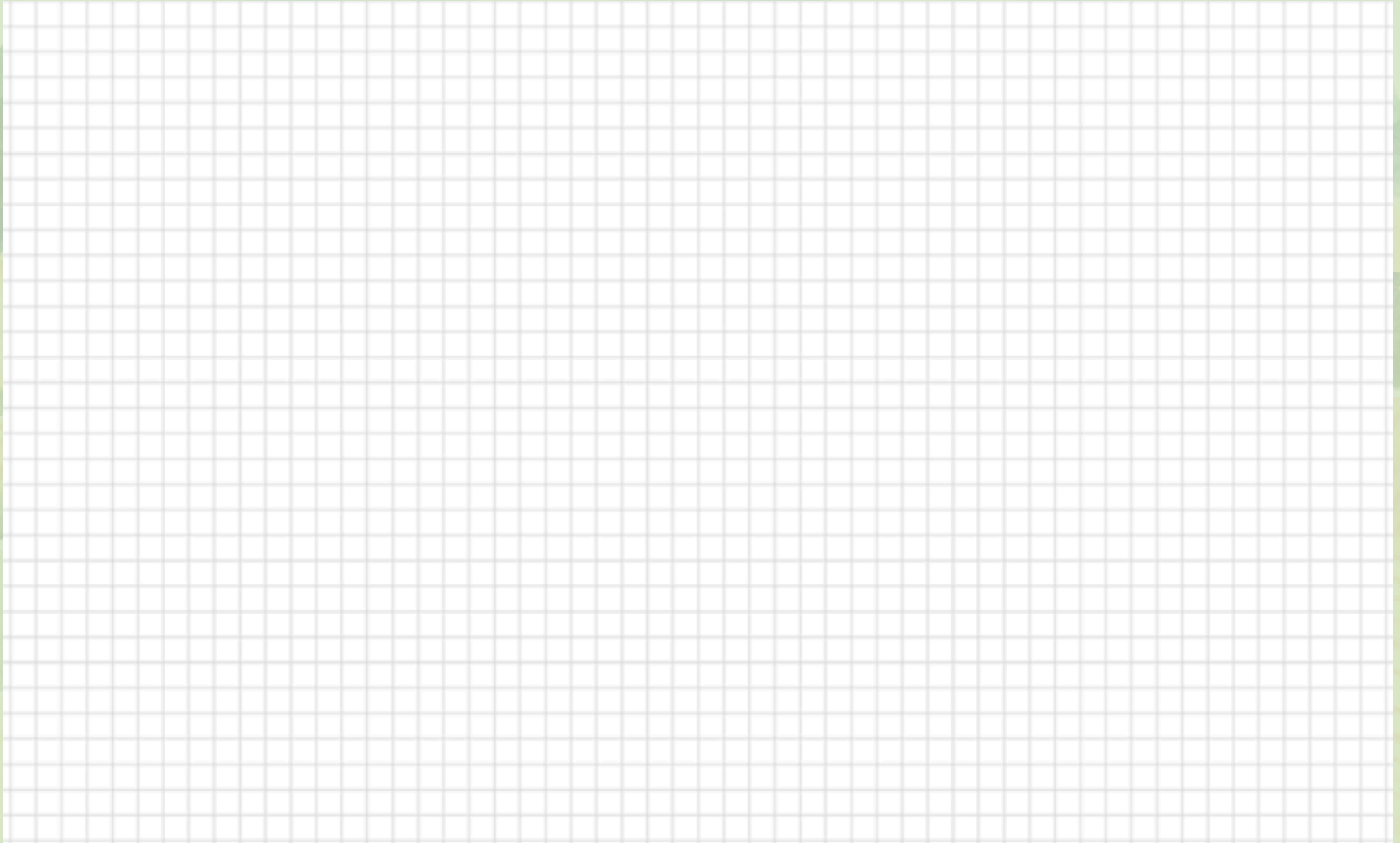
## Activity 02 : Create your farm profile

- Try Filling information of your farm.
- Take help of your facilitator if you can not fill it on your own.
- Try discussing it with other farmers in farmer group.
- Try to learn more about farm profile.

## Activity 04: Feedback form

- Give feedback as it will help your facilitator to help and improve your learning.
- Discuss it with other farmers and learn about their experience as well.
- Ask questions and take help of your facilitator, when you need.

## Activity 01 : Picture your farm (Current conditions)



## Activity 02: Create your farm profile

• Farm type	
• Terrain	
• Area	
• Aspect (Farm facing direction)	
• Physical features	
• Soil Type	
• Inputs needed <ul style="list-style-type: none"><li>◦ Labor</li><li>◦ Machinery</li><li>◦ Water</li><li>◦ electricity</li><li>◦ fertilizer</li><li>◦ pumps</li></ul>	
• Temperature Range (By month)	
• Precipitation Range (By month)	
• Commonly grown crops	
• Natural challenges (climate, pests, invasive species-weeds)	
• Any CSA methods in use	

## Activity 03 : Evaluate CSA methods

(Post-implementation)



Decreased



No impact



Partially Increased



Significantly Increased

### Resources and indicators

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• EASE OF TECHNOLOGY USAGE



• CROP PRODUCTION



• CROP QUALITY



• OCCURRENCE OF PEST



• OCCURRENCE OF WEEDS



• WATER REQUIRED



• FERTILIZER REQUIRED



• LABOR REQUIRED



• INCOME



• WORKLOAD



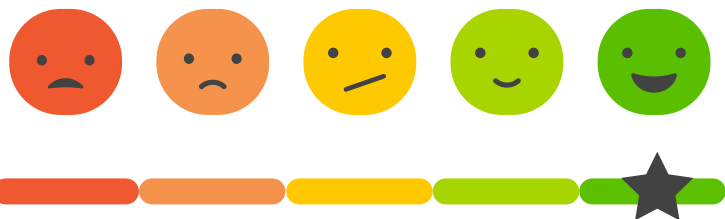
• FREE TIME AVAILABLE



• USAGE OF CSA METHODS IN FUTURE



## Activity 04 : Feedback form



Experience scale

Do you have any question/Suggestion?

Fill the feedback form below at end of your training by marking it like this. 😊👍 that is closer to your experience.

1. What do you like the most about this guide?

2. Is there anything that you want to suggest for improvement?

3. Do you have any suggestions for facilitator?

4. How useful are these sessions for you for your farm?



5. How engaging are these sessions?



6. How likely are you to recommend CSA methods to other farmers?



This image shows a single page from a notebook or binder. At the top, there is a light purple rectangular header with rounded corners. Inside this header, the word "Notes" is written in a bold, black, sans-serif font, centered horizontally. Below the header, the rest of the page is white and filled with horizontal grey lines, providing space for writing. The lines are evenly spaced and extend across the width of the page.

[illegible]





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