

# EFFECTS OF COLOR OF FACILITIES ON EVALUATION OF FARM LANDSCAPE

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## ABSTRACT

The objective of this study was to make clear the color of farm facilities, being harmonious with the landscape. For the color design of farm facility, the questionnaire was given to 429 subjects by the 8-ordered choices from each figure painted 8 colors, i.e., red, yellow-red, yellow, green, blue, purple, white, and black, in each landscape element of the roof of barn, the board of fence, the steel tower and the plastic-pack of silos by using the image processor. The harmonious color chosen were red in the roof of barn and mostly white in both fence, steel tower silo, and plastic-pack silo in spite of the existence of background. Furthermore, the color-difference between the element and the point near the element was compared with the harmonious color.

## KEYWORDS

Color, Evaluation, Farm facility, Landscape, Questionnaire.

## INTRODUCTION

The farm with green pasture has recently been watched having the function with a better amenity to visitors, while having the animal production through the grassland. The farm is actually surrounded by green pasture and many facilities like a barn, fence, steel and plastic-packed silos with various colors. In the rural environment, we often find the beautiful farm-landscape, and the farmers themselves keep its beautification in Japan, as Hosokawa (1994a) reported. When we actually look at the farm facility, it is evaluated whether that the color of the facility is harmonious with the farm landscape or not. For example, Hosokawa et al. (1994 and 1995) reported that the white-board fence was selected as the harmonious fence with grassland rather than the other color. Using this result, Hosokawa (1994b) developed a new fence used the white-colored dropper with a preferable impression. Thus, it is important to select the harmonious color with the farm landscape in the design of farm facilities. In this design, it is necessary to reflect the ideas of regional inhabitants and visitors from other places.

## MATERIALS AND METHODS

The original figures with the landscape element of barn, fence, and silo were selected from photos by an ordinary camera, and then the element parts of the roof of barn, the fence board, the steel tower and the plastic-pack of silos were painted 8 colors of red, yellow-red, yellow, green, blue, purple, white, and black by using the image processor (ADS, CANVAS CIP-3000). The questionnaire was given to 429 subjects by the 8-ordered choices in each figure with and without the background. Each color was evaluated by a point system from the best harmonious one (point 7) to the most inharmonious one (point 0), and then was classified into 4 types, i.e., I( $M \geq 3.5$ ,  $S < 4.0$ ), II( $M \geq 3.5$ ,  $S \geq 4.0$ ), III( $M < 3.5$ ,  $S < 4.0$ ), IV( $M < 3.5$ ,  $S \geq 4.0$ ), based on weighted mean( $M$ ) and variance( $S$ ) calculated from the pointed color-grade. The color-difference between the landscape element and the point near the element in the background in the original figure was measured by a color-difference instrument (Minolta, CR-200) to grasp the reason why the evaluated color was harmonious.

## RESULTS AND DISCUSSION

As shown in Table 1, the best harmonious colors were selected red in the roof of barn and mostly white in both fence, steel tower silo and plastic-pack silo in spite of the existence of background. Then, the next colors chosen as  $M \geq 3.5$  were black, green, and yellow-red

in the roof of barn with background, and yellow-red, yellow, and green in the fence, blue, yellow-red, and yellow in the steel tower silo, and yellow, yellow-red, and blue in the plastic-pack silo. Although the area of roof, a distance view in the figure, was only 7% of total figure area, it was estimated that red of the roof was harmonious with blue sky near the roof as a landscape element. Since the background nearby fence was in a little darkened green woods and that of plastic-pack silo was grassland, the fence and plastic-pack silo as the landscape element harmonized with white-color. In the case of the steel tower silo, the element of a close-range view was also just dark, and then bright colors were preferable.

The color-difference between the landscape element and the point near the element in the background was shown in Table 2 in the case of the roof of barn and fence. In the case of blue blue sky near the roof, red being the middle color-difference (38.2) against blue was preferable, but white being too small color-difference (15.9) was inharmonious. In the case of woods near the fence, white being the middle color-difference (44.1) was very preferable, but purple, blue and black being smaller color-difference (42.5, 31.5, and 14.0, respectively) were inharmonious. The color-difference of white against grassland near the element indicated a middle value of 45.5. Therefore, the color of facilities in the landscape is evaluated the harmony with the surrounding element color indicating neither larger nor smaller color-difference.

## REFERENCES

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**Table 1**  
Color evaluation in farm facilities with background

Element	Value	Red	Yellow-red	Yellow	Green	Blue	Purple	White	Black
Roof of barn	M	4.66	3.92	2.73	3.94	3.31	2.76	2.72	3.97
	S	3.63	3.71	3.50	5.27	5.01	5.78	4.70	6.70
	Type	I	I	III	II	IV	IV	IV	II
Fence board	M	3.15	4.49	4.48	3.50	2.38	1.79	5.73	2.47
	S	2.86	2.94	2.92	4.02	3.11	4.00	3.59	6.28
	Type	III	I	I	II	III	IV	I	IV
Steel tower of silo	M	2.84	4.10	3.84	3.40	4.31	1.74	5.60	2.18
	S	3.04	3.14	3.16	4.67	4.25	3.77	3.97	5.16
	Type	III	I	I	IV	II	III	I	IV
Plastic-pack of silo	M	2.80	4.13	4.23	4.08	3.67	1.99	5.56	1.55
	S	2.51	3.51	3.13	4.12	4.05	4.10	3.74	4.73
	Type	III	I	I	II	II	IV	I	IV

**Table 2**  
Color-difference between element and point near the element

Element	Point	Red	Yellow-red	Yellow	Green	Blue	Purple	White	Black
Roof of barn	Sky(blue)	38.2 <sup>1</sup>	31.8 <sup>4</sup>	33.9 <sup>7</sup>	29.7 <sup>5</sup>	25.7 <sup>5</sup>	39.2 <sup>6</sup>	15.9 <sup>8</sup>	41.1 <sup>2</sup>
	Grassland	42.4	31.7	27.4	19.6	45.2	56.7	37.9	32.1
Fence board	Woods	35.4 <sup>5</sup>	37.8 <sup>2</sup>	46.1 <sup>3</sup>	40.9 <sup>4</sup>	31.5 <sup>7</sup>	42.5 <sup>8</sup>	44.1 <sup>1</sup>	14.0 <sup>6</sup>
	Grassland	34.1	31.1	35.5	38.6	46.0	48.8	45.5	32.8

1 - 8 : Order by weighted mean (M)