



Assessment Of Crop Diversification Index (CDI) - In Kadwanchi Village Of Jalana District- A Success Story Of Sustainable Development Principles

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	Abstract
CC License CC-BY-NC-SA 4.0	<p><i>Kadwanchi</i> watershed is situated between latitude 19°53' N and longitude 76°00' E. <i>Kadwanchi</i> watershed consists of three villages namely <i>Kadwanchi</i>, <i>Waghurul</i> and <i>Nandapur</i> with area 1607.64, 28.40 and 252.03 hectares respectively. <i>Krishi Vigyan Kendra, Jalna</i> sponsored by Indian Council of Agricultural Research (ICAR) New Delhi and established by <i>Marathwada Sheti Sahayya Mandal</i>, Non-Government Voluntary Organization initiated extension activities from 1993 in small village <i>Kadwanchi</i>. The changes in the socio economic conditions of farmers is associated with changes in cropping pattern. Under Indo –German Watershed Development Program (IGWDP), the watershed activities have been carried out. In this research paper Crop Diversification Index (CDI) has been calculated to study variation in cropping pattern in pre and post condition of watershed activities implementation.</p> <p>Keywords: <i>Watershed, Irrigation, Agriculture change, Crop Diversification.</i></p>

Introduction

The study village Kadwanchi became a model village of watershed development due to mass participation. To assess the success of watershed development work and its sustainability several indicators and technologies are available. Sustainable development owes the judicious use of developed natural resources and getting the maximum benefits for socio-economic upliftment of communities. In this research investigation, we used the Crop diversification Index (CDI) to study the changes in cropping pattern in Kadwanchi village.

Methodology

The indicators for assessment of impacts of watershed development programs published by the team of (V.N. Sharada, Pradeep Dogra and B.L. Dhyani, 2012, Indian Journal of Soil Conservation, Page.1) have been used to calculate the Crop Diversification Index (CDI). The following formula has been used for the mapping of CDI index of Kadwanchi village.

$$CDI = \sum_{i=1}^n P_i \log\left(\frac{1}{P_i}\right)$$

Where P_i is proportion of i^{th} crop in comparison with total cropped area and n is the total number of crops in the watershed. The value of index can attain the any value > 0 . For calculating the change in cropping pattern and CDI index, the benchmark of year 2001 taken, which further compared with CDI index for the year 2023. The observed changes in CDI have been reported in the results and discussion section.

Results

Kadwanchi village is fall in the rainfed region of Maharashtra, where the erratic rainfall has been reported. The reliance of framing is on subsurface water through borewell and dug wells. The geographical area of Kadwanchi village is 1888 hectare and total cropped area is 1511 hectare. The number of crops taken during the year 2001 is eight and diversification of crop leads to total 11 crops in the year 2023. The results of CDI index are given in Table No.1. The significance of CPI index studies crop improvement undertaken during a watershed management project is minimization of risk of crop production through crop diversification. CDI index generally used to used to study measure of better crop diversification.

Table No.1- Crop Productivity Index of Kadwanchi village in Pre and Post conditions of watershed development projects

Year	2001					2024				
	Crop	Area	Pi	(1/Pi)	log(1/pi)	Pi.log (1/Pi)	Area	Pi	(1/Pi)	Log (1/pi)
Bajara	303	0.20	4.99	0.70	0.14	3	0.00	503.67	2.70	0.01
Black Gram	42	0.03	35.98	1.56	0.04	12	0.01	125.92	2.10	0.02
Green Gram	161	0.11	9.39	0.97	0.10	61	0.04	24.77	1.39	0.06
Cotton	347	0.23	4.35	0.64	0.15	302	0.20	5.00	0.70	0.14
Winter Jowar	361	0.24	4.19	0.62	0.15	350	0.23	4.32	0.64	0.15
Wheat	99	0.07	15.26	1.18	0.08	10	0.01	151.10	2.18	0.01
Red Gram	35	0.02	43.17	1.64	0.04	40	0.03	37.78	1.58	0.04
Ginger	2	0.00	755.50	2.88	0.00		0.00	00	00	0.00
Grape	62	0.04	24.37	1.39	0.06	600	0.40	2.52	0.40	0.16
Pomegranate	98	0.06	15.42	1.19	0.08	20	0.01	75.55	1.88	0.02
Custard Apple/Orange	00	00	00	00	00	25	0.02	60.44	1.78	0.03
Vegetables	1	0.00	1511.00	3.18	0.00	88	0.06	17.17	1.23	0.07
Total cultivated area	1511				0.84	1511				0.71
CDI of 2001- 0.84						CDI of 2024- 0.71				

The values of CDI index for the 2001 is 0.84 (Pre-Conditions), which has been observed 0.71 (Post conditions) in the year 2024. The per capita income of farmers family is Rs.4500/- to Rs. 1.75 lakh in the year 2023. This change leads to socioeconomic upliftment of farmers conditions, while maintaining the developed natural resources.

Discussion

India's water sustainability is dependent on the community involvement and setting of standard norms form utilization perspective. (S. K. Gupta, R. D. Deshpande) *Krishi Vigyan Kendra, Jalna* sponsored by Indian Council of Agricultural Research (ICAR) New Delhi and established by *Marathwada Sheti Sahayya Mandal*, Non-Government Voluntary Organization initiated extension activities from 1993 in small village *Kadwanchi*, in Jalna district. The success indicators of the watershed are due to following reasons such as following ridge to valley approach, socio –technical intervention of activities, training and capacity building, judicious use of developed natural resources, strong institutional arrangements, functioning of the village level watershed committees (Wani SP. 2008). CDI index is one of the great tools to assess the positive impacts of watershed management.

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