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Examine the relationship between independent and dependent variables of Niger production technology among Niger grower

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Abstract
The research was conducted in the Jashpur district of Chhattisgarh state during the years 2021- 2022. Within Jashpur district's eight blocks, two were purposefully chosen due to their significant Niger crop cultivation compared to others. A total of 140 farmers were selected for the study, and data were collected through personal interviews. These data were subsequently analyzed using statistical tools to provide meaningful information. The main findings are that knowledge is strongly linked to land holding, annual income, and productivity at a high level of significance (0.01%). Occupation and farming experience also have a positive but slightly less significant relationship with knowledge (0.05%). Similarly, adoption is highly significantly associated with land holding, annual income, productivity, and extension contact (0.01%), while education, occupation, and farming experience show positive but somewhat less significant connections with adoption (0.05%).

Keywords: Relationship, knowledge, adoption, production technology and niger grower

Introduction
Niger (*Guizotia abyssinica*) is of significance as it belongs to the Asteraceae family and is known for its essential oil with healing properties, originating in India and Ethiopia. Despite being a minor oilseed crop, Niger is noteworthy because its seeds contain 32 to 40% oil and 18 to 24% protein, as stated in the research by (Dastagiri and Jaimuddin 2017) [3]. Niger oil, a slow- drying oil, finds applications in food, paints, soaps, and lighting. It can be mixed with rapeseed, sesame, and linseed oils and serves as a substitute for olive oil in cooking. Additionally, the extracted oil is utilized for treating burns and scabies. The seeds are used as a condiment after frying, and the press cake leftover from oil extraction is used in animal feed. Niger oil has a lengthy shelf life and contains 70% unsaturated fatty acids free from contaminants, making it potentially beneficial for one's health. To increase crop yield, it is crucial to optimize land utilization and adopt improved crop management techniques. Furthermore, the adoption and dissemination of modern agricultural technology are vital for the Indian economy. Thanks to concerted efforts, oilseed production in India has grown significantly, from 108.3 lakh metric tons in 1985-86 to 361.009 lakh metric tons in 2020-21. This increase is attributed to both an expansion in cultivation area and enhanced productivity, which rose from 570 kg/ha in 1985- 86 to 1284 kg/ha, 1224 kg/ha, and 1254 kg/ha in 2017-18, 2019-20, and 2020-21, respectively. Favorable weather conditions and government support for oilseed production programs and policies contributed to India achieving its highest-ever oilseed production of 361.009 lakh metric tons in 2020-21, following 332.192 lakh metric tons in 2019-20, along with record productivity levels of 1284 kg/ha in 2017-18 and 1254 kg/ha in 2020-21. It's well- acknowledged that rural change agents with a high level of expertise and professionalism play a crucial role in modernizing agriculture. These agents are responsible for keeping the farming community informed about the latest advancements in agricultural technology and facilitating the adoption of new technologies. In the state of Chhattisgarh, Niger crops are cultivated in regions such as Sarguja, Jashpur, and Bastar. According to the ICAR (2011-14) report, the cultivation area for Niger is as follows: Sarguja - 22.00 thousand hectares, Jashpur - 21.33 thousand hectares, and Bastar - 11.00 thousand hectares, as reported by (Ranganatha *et al*. 2013) [11].

Among the oilseed crops sown in these tribal-dominated areas, Ramtil cultivation is predominant and locally known as "Jatangi." In Jashpur district, the total area under oilseed crops is 3639 hectares, with Niger being cultivated on 3534 hectares.

Additionally, there is significant production of Ramtil in Jashpur district. This crop holds importance not only for farmers but also for traders. The production of Ramtil in the Jashpur district, extending to the border areas of Jharkhand and Surguja division, exceeds 50 to 60 lakh dollars and is exported annually, as noted by (Chaudhary, N,S. 2020) [1].

Material and Methods

The study took place in the Jashpur district of Chhattisgarh state due to its extensive Niger crop cultivation, with a focus on 2 out of the district's 8 blocks that had the highest Niger crop acreage. From each of these selected blocks, 7 villages were chosen at random. Consequently, a total of 140 respondents were included in the study, with 10 farmers selected from each of the 14 villages.

Results and Discussion

Table 1: Correlation analysis of independent variables with the level of knowledge and extent of adoption of Niger production technology.

Sl. No.	Correlation	Knowledge (r' value)	Adoption (r' value)
1.	Age	0.102 NS	0.164 NS
2.	Education	0.106 NS	0.168*
3.	Family size	0.039NS	0.048NS
4.	Occupation	0.175*	0.181*
5.	Farming experience on Niger cultivation	0.195*	0.168*
6.	Land holding	0.572**	0.441**
7.	Annual income	0.223**	0.220**
8.	Area covered under Niger cultivation	0.102 NS	0.154 NS
9.	Productivity	0.250**	0.220**
10.	Extension contact	0.081 NS	0.081 NS
11.	Source of information	0.134 NS	0.138 NS
12.	Economic motivation	0.220**	0.222**
13.	Scientific orientation	0.067 NS	0.094 NS

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed). NS- No significant

As shown in Table 6, knowledge was positively and highly significantly related to land holding, annual income, and productivity at the 0.01 percent level of significance, while occupation and farming experience were positively and significantly related to knowledge at the 0.05 percent level of significance. The strong correlation indicates that when the degree of the factors mentioned, including land holding, annual income, productivity and economic motivation, improves, knowledge will also improve automatically. There is no significant relationship between age, education, family size, area covered under Niger cultivation, extension contact, source of information and scientific orientation with their knowledge level about Niger production technologies. A similar report was filled in for age by Devarani and Bandhyopadhyay (2014) [4] and family size by Rajan *et al*. (2021) [9]. And similar results were reported by Bhoi *et al*. (2014) [9] area covered by castor cultivation and economic motivation by Kumar Mahendra and Kumawat (2019) [6]. So, there will be no changes if these variables increase or decrease. In a similar way, adoption was positively and highly significantly related to land holding, annual income, productivity and extension contact at the 0.01 percent level of significance, while education, occupation, and farming experience were positively and significantly related to adoption at the 0.05 percent level of significance. In the case of land holding, similar results were revealed by Mazumder *et al*. (2011) [12] whereas in extension contact similar results were revealed by Jeelani *et al*. (2014) [5]. The significant correlation indicates that as the degree of the factors mentioned, including land holding, annual income, productivity, education, occupation, and farming experience, improves, the respondent's adoption will also improve. There is no correlation between age, family size, extension contact, source of information, scientific orientation and area covered under Niger cultivation to extent their adoption of Niger production technologies. Similar findings were reported in the case of age and family size by Pandya *et al*. (2014) [7] and Singh *et al*. (2022) [10]. And similar results were reported by Patel *et al*. (2014) [2].

Conclusion

The above study conclude that knowledge was positively and highly significantly related to land holding, annual income, and productivity at the 0.01 percent level of significance, while occupation and farming experience were positively and significantly related to knowledge at the 0.05 percent level of significance. In a similar way, adoption was positively and highly significantly related to land holding, annual income, productivity and extension contact at the 0.01 percent level of significance, while education, occupation, and farming experience were positively and significantly related to adoption at the 0.05 percent level of significance. The significant correlation indicates that as the degree of the factors mentioned, including land holding, annual income, productivity, education, occupation, and farming experience, improves, the respondent's adoption will also improve.

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