Original Research Article

Factor affecting Purchase of Quality Wood: Understanding Perceptions of Wood Workers using Logistic Regression Model

ABSTRACT

Woodworkers purchase wood from farmlands as well as from the timber markets, transport them and later convert them into usable products keeping in mind their profitability and customer relationship. Wood with problems not only devoid woodworkers with profit, in turn, affect customers with low quality products. This research is, therefore, formulated to understand factor affecting wood workers 'choice of quality furniture in Multan timber market, Pakistan. A total of 60 respondents were interviewed by administering questionnaire using snow-ball sampling technique. The wealth of information obtained thus analyzed using logistic regression technique to draw meaningful inferences. The results revealed that wood problem to the likes of Insect's pests and diseases (B= .234, Wald 3.687, sig .055) shows wood defects (B=-.294, Wald 3.833, Sig -.050) and perception of safe transportation (B= 3.833, Wald= 5.479, sig =.019) positively affect wood workers' choice of quality wood purchase. The research concluded that woods available in timber markets should be free from insect pests and defects damage to save woodworkers and customers premiums.

KEYWORDS: Timber, perceptions, regression, Wood traders, consumers, wood problems

1. INTRODUCTION

Wood is an important and versatile material [1], being used for numerous products for almost segments of society, hence, it emphasizes to increase its production and utilization sustainability [2]. The sawn timber then converted to numerous products meeting the taste of consumers (Bumgardner et al., 2007) work workers and traders to render quality and

profitability. Hence, choice or wood and design is dependent upon several factors such as durability, availability, strength and cost in combination [3]

Woodworkers purchase wood from farmlands as well as from the timber markets, transport them and later convert them into usable products. Low-cost wood with less problems in conversion and free from wood problems, viz-a-viz., insect pests infestation and fungal diseases [4,5], physical wood problems such as knots, wane, stains, shakes and cracks [6,7,8] are instrumental in generating premiums for woodworker on one and and quality product to consumer on the other.

Besides, woodworkers looking for their benefits and choices regarding wood quality, emphasis should also be given to consumer choice and preferences at large. For instance, purchasing behaviors, properties and choices of customers could reflect from age, education, gender, supply, demand reflected from demographic features [9,10,11]. To most of the consumers visible, clear finish surface would create positive impression. Hence, in most countries, most of the consumers prefer Wood sorting, classification selection based on technical properties as well as free of any defects and diseases in order to obtain more solid wood [2] is a guideline for woodworkers and traders to go after

Keeping in view of the preference and parameters affecting wood choice, this research is aimed as how woodworkers perceive factors affecting the purchase quality woods.

2. METHODOLOGY

Location

Present study was conducted in Multan district timber market. Multan is one of the oldest cities in Pakistan. It is surrounded by river Chenab and is famous place for many saints to visit and stay and hence called as “city of saints”. The district is also famous to produce Pakistan’s best mangoes. Farmlands are filled in with cash crops like cotton, sugarcane, and rice along with trees namely *Vachellia nilotica, Mangifera indica, Sygygium cuminii, Dalbergia sissoo, Albizzia lebbek, Morus alba, Azadirachta indica, Melia azadirach Eucalyptus camadulensis* etc. Timber

market is also one the Pakistan's biggest market carrying both hard and softwoods, local as well as imported from other countries.

Research Design and Sampling

The research made use of survey methodology to administer questionnaire on study respondents. The interview schedule consists of structured and semi structured questions finding how woodworkers perceive factors affecting their wood preferences. Respondents' selection followed snow-ball sampling process wherein basic information was obtained from the timber dealers in Multan timber markets. Later, upon visiting a woodworker workshop, information for the next interview obtained, like wise respondents were approached and made up a total sample of 60 woodworkers.

Data Collection Instrument and Procedures

Respondents when approached, they were clearly informed about the purpose of the study and all contents of questionnaire were shared and clarify any ambiguity raised by the respondents. Attention was given to free time of woodworkers and by doing so, some of the respondents were paid several visits. Face to face interviews were carried out and questions were translated in local dialect for ease of understanding by the respondents. The wealth of information, thus collected, summarized, and later analyzed to draw meaningful inference

Statistical analysis

The data were analyzed using SPSS software. Logistic regression technique was employed to understand woodworkers' perceptions to purchased quality wood.

3. RESULTS

Logit Model

Logit regression model tells existence of relation among variables. Binary Logit Regression (BLR) model applied here to elaborate how independent or response variable is influenced and

correlates by dependent variables. Chi square with maximum likelihood evaluation function, applied here is a standard method that is commonly employed due to the fact that model results are accordant, asymptomatically efficient, and sufficiently distributed. Total number of seven variables were employed in the binary logit regression model; and out of these seven, four variables turned out depicting significant contribution in the model. Age, defects, insect pests and diseases and safe transport are the variables that proved to be significant. Results depicted wood workers had ample know-how regarding defects, insect pests and diseases along with the fact that younger aged ones had more information regarding this.

Formula: Logit Model (pi) = Log (pi/1-pi)

Where, pi denotes the probability of yes and (1-pi) is the probability of no. Where odds for dependent variable (that showed significant contribution) and independent variables are:
The empirical model that had been derived for the recent research is:

Log (pi/ 1 – pi) =0+ Insect pests and diseases+ defects+ safe transport to carry wood and products

Where age had levels (1= 10-30, 2=31-45, 3=46-60, 4= above 60), insect pest and diseases had 2 levels (1=termite attacks, other insects), defects had 5 levels (1= breakage, 2=shrinkage and occurrence of shakes, 3= twist and breakage, 4=swelling, 5=tweak sound and 6=No opinion) and safe transport to carry wooden furniture/doors/windows had following 6 levels (1= truck/mini truck, 2= train, 3= trailer, 4= container, 5= cart, 6= carry dala).
Whereas independent variable had 2 levels (1=yes, 2=no).

Table: 1 Logit regression model

Variables in the Equation						
	B	S.E.	Wald	Df	Sig.	Exp(B)
Age	-.921	.452	4.152	1	.042	.398
Education	.437	.426	1.051	1	.305	1.548
Profession	-.263	.314	.697	1	.404	.769
Insect pests and diseases	.234	.122	3.687	1	.055	1.263
Wood defects	-.294	.150	3.833	1	.050	.745
Factors effecting purchase	-.250	.207	1.449	1	.229	.779
safe transport to carry wooden items	.592	.253	5.479	1	.019	1.807
Constant	4.700	3.262	2.075	1	.150	109.913

B = Beta, S.E = Standard Error, Wald = Wald Chi Square, Df = Degrees of Freedom, Sig = Significant $p \leq 0.005$.

The odds for age (B = -.921, Wald 4.152, sig 0.042) is negatively correlated with independent variable (i.e. can wood workers judge quality of furniture), negative sign indicates youngers with more perceiving capability and judgement skills regarding inspecting quality of wooden furniture/ doors/ windows. The odds for Insect's pests and diseases (B= .234, Wald 3.687, sig .055) shows positive correlation with independent variable and positive sign with beta depicts that wood workers inhabit enormous information regarding insect attacks comparatively. Negative sign with beta regarding odds of defects (B=-.294, Wald 3.833, Sig -.050), vividly clarifies that breakage and shakes were more evident as compared to other defects such as swelling and twist. Regarding safe transport (B= 3.833, Wald= 5.479, sig =.019) illustrate that consumers preferred "trucks/mini trucks" as compared to other vehicles.

4. DISCUSSION

Regression logit model was applied using Chi square test for finding correlation between independent or response variable and dependent variables. Maximum likelihood application is a standard method that is often used to evaluate probability functions. Out of seven dependent variables, 4 variables turned out to be significant. Independent variable i.e. perception on judgement quality furniture while dependent variables age, education, income, insect pests and diseases, wood defects (breakage, crack etc.), factors effecting purchase, safe transport to carry wooden furniture/windows/doors were set. Among 7 independent variables, age, insect pests and diseases, wood defects (breakage crack etc.) and safe transport to carry wooden furniture/windows/doors proved to be significant. Test's results showed that younger aged wood workers were actively responding and had sufficient information regarding quality judgement. Similar research conducted in US turned out opposite and contrary outcomes as in US, it illustrated that senior citizens had more information and judgmental skills as compared to younger ones [12]. It is evident from results that huge percentage noticed diseases and insect pests in their wooden furniture. Odds depicts that wood workers perceived 'insect pests and diseases' in their wooden furniture greater than 'termite attacks'. [4] clarified deterioration caused by dry wood termites i.e. species of Kalotermes and Incisitermes. Formerly mentioned species can survive in even 3% moisture content and attacks wood. [5] inferred in same scenario deteriorating effects on furniture items of wood boring beetles such as powder post, deathwatch, and false powder post. Beetles invade wood and worsens its physical and mechanical properties badly. Results for defects vividly entitles it a severe issue wherein negative value for beta clarified that breakage and shakes were more dominant as compared to other defects. [13] narrated in the same line that in Tumulus, Turkey, coffins and other wooden furniture were damaged to a huge extent.

Since, woodworkers are often concerned with their profitability while purchasing different woods and converting them into products, wood defects are very carefully evaluated as it has direct effect on product quality and in turn effect woodworkers' premiums. For instance, important concern to purchase woods mainly dependent upon wood grains, color, weight etc. under shadow of skills and know-how. [14] discussed same scenario concluding mechanical

testing being very effective in determining quality of the timber. Assessment of furniture quality was elaborated by respondents owning to their experience and knowledge. Replies covered material or wood type, finishing, weight and color etc. [15] ascribed in the similar reference, branding as key indicator assisted in quality judgement of furniture. Another factor, durability and quality being directly proportional to each other, so observing wood type for assessing furniture quality is fundamental. Wood has been suffering from imperfections since long. These imperfections come forward in various forms such as shakes, cracks, insect pests, termite attacks, fungal attacks, twists, stains, decay etc. [16] declared growth stresses also known as self-stresses as the great cause of "heart shakes" and were caused in consequence of cutting methods. Saw cut results in transverse stress imbalance, consequently "transverse shakes" are formed. [17] conferred same approach while assorted relating problems into two categories; repairable blemishes included breakage, pinholes, discoloration and wooden heart whereas the wooden knots, cracks, black spot and decay being non-repairable. [18] reported fact referring woods feature to worsens itself in nearly13 years, this deterioration span could be extended by chemical treatments and finishing applications.

5. CONCLUSION

The research concluded that timber markets carry woods that might be free from wood defects, insect pests and fungal infestation and may be sawn size that could easily be transported. This shall not only increase productivity of the markets but also save precious premium of the woodworkers that in turn provide better furniture and other wood products to consumers at affordable costs.

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