Original Research Article

The predictive validity of Theory of Planned Behaviour to understand performance of Agroforestry in Punjab, Pakistan

ABSTRACT

Agroforestry remained instrumental in ensuring food security, ameliorate environment and support livelihood across the globe particularly the developing countries. Present research made use of Theory of Planned Behaviour (TPB) to understand performance of agroforestry in Southern Punjab. A total of 130 randomly selected respondents belonging to two groups (AF and NAF) were interviewed to explore their attitudes, Subjective Norms (SN) and Perceived behavioral Control (PBC) to form intention to grow trees along with agricultural crops on their farms. Results revealed that constructs of TPB explained AF showed positive attitudes underpinning beliefs, value opinions of salient referents and feel more ease in planting trees than those of NAF thereby forming positive intention to adopt agroforestry. It is concluded that application of this model would be helpful in the promotion of agroforestry in the region.

Keywords: TPB, Agroforestry**,** Perceptions, adoption**.**

1. INTRODUCTION

The prevalence of poverty coupled with environmental problems, food insecurity and limited available resources to support livelihood are denting heavily the socio-economic profile of developing countries. Nevertheless, Agroforestry, a land use system combining trees and agricultural crops (grains, cash crops and fodder) in a profitable spatial and or temporal order andis an important tool to resolute such issues to the satisfaction of ultimate beneficiaries [1,2,3].Numerous projects have been designed and executed in developing countries for the promotion of agroforestry, yet the uptake and scaling up interventions remained low and lacks stakeholders' participation [4]. Thus, before the onset of any agroforestry adoption practice and campaign, it is inevitable to

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weigh stakeholders' attitudes and perceptions and factors affecting the uptake of a particular intervention.

Intention to opt for Agroforestry is mainly influenced by the beliefs underlying constructs of TPB, whose relationship with intention may in turn be influenced by the frequency with which tree planting has been practiced in the past [4].[5] explained, "human beings are creatures of habit in that they tend to persist in doing what they have become accustomed to". The TPB by Ajzen is a reputable model that predicts that an individual's intentions to perform a behavior could be stemmed from his attitude, approval (disapproval) by the salient referents around the individual and factors affecting the performance (continuation/ discontinuation) of a behaviour (Perceived Behavioralcontrol)

TPB model has been widely applied to number of behaviours related to natural and social sciences, nonetheless, its application towardsagroforestry adoption is pivotal. For instance,[6] usefully predicted sustained adoption of agroforestry in sub-saharan Africa using TPB. Farmers' intentions to diversify agricultural production was predictcted by the constructs in TPB in Brazil [7]. Moreover, in Indonesia TPB predicted that trimming techniques could improve coffee production in a pine-coffee system [8].

Thus, importance of agroforestry and predictive validity of TPB, this research has been formulated to to comprehend people's views regarding planting trees, factors that affect their attitudes and difficulty and ease while planting trees on farmlands and salient referents whose approval and disapproval is important in the performance of agroforestry. This will certainly help to devise policies for the promotion of agroforestry in southern Punjab.

2. METHODOLOGY

2.1. Locale

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Present study was conducted in Multan. Multan is having arid climate with hot summers and cold winters; it is an agricultural city situated at bank of river Chenab and famous for its mango varieties and production besides numerous productive crops. Farmlands of Multan having trees in different combinations.

2.2. Study strategy and Sampling procedure:

The research is conducted using survey methodology wherein questionnaire instrument has been prepared administered. Respondents were selected and subjected to face to face interviews for filling in questionnaire. The interview schedule mainly contains structured contents, scale questionees and few open-ended questions.

A two-stage sampling procedure has been adopted for the selection of respondents. In the 1st stage out of 4 tehsils of Multan, 02 (Shujabad and Mulan Saddar) administrative units were selected. In the second stage, out of these tehsils, 13 villages (shujabad=7, Multan saddar=6) were selected. Finally, respondents were selected out of randomly selected villages and 10 respondents comprising make and female were finally selected to make up of 130 randomly selected respondents which were belonging to 02 groups (Agroforestry=AF and Non-Agroforestry=NAF).

2.3. Data Collection Procedure and statistical analysis

Theory of Planned Behavior (TPB)

The study made use of TPB to understand agroforestry adoption behavior. According to the Theory of Planned Behavior, Asking someone if they intend to act a certain manner is the simplest method to predict their conduct. the 2005 model for the theory of planned conduct that was derived from Ajzen. The three factors that determine intents, which in turn influence behaviors, are attitudes, subjective norms, and perceived behavioral control, claims the theory of planned behavior. According to Azjen, three components explain behavioral intention: The perception of behavioral control (self-efficacy with relation to behavior), perceived behavioral norm (other people's perceptions of a behavior), and attitude (opinions of oneself towards the activity. TPB has been used as a framework in current research so that we can focus on more relevant elements of tree planting behavior. These factors include respondents' perceptions of their own degree

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of control over their tree-planting behavior, salient referents' influence, and the effects they predict from planting trees at the farm level. The model provided the arrangement of its elements, which are recognized to have an impact on behavioral intentions.

The model can be expressed mathematically as follows:

$B\alpha\ I = f\ \{Att + SN + PBC\}$

where B is the tree-planting behavior at the farm level

I = Willingness to plant trees on farmland

Att = Perception of planting trees on agricultural land

SN = Subjective norm in favor of farming land tree planting

PBC = Perceptions of control over the planting of trees on farmland.

The TPB's interaction between the constructs can be influenced by the selection of an appropriate scaling approach. Likert Scales are made up of several connected "Likert-type items"—statements about a particular referent, or the topic of the attitude to be assessed. To lessen response-set bias, a balance of both positive and negative items is typically advised. On a bipolar scale, subjects express how they feel about each topic, choosing from the options "strongly agree, agree, undecided, disagree, and strongly disagree." Each subject's responses are graded from one (1) to five (5), with negative responses being reverse-coded. The results are then added up to determine the respondent's Summated Rating Score or Likert Scale value(Hooker, 2016)

At the outset, respondents were accessed while working/available at field. The respondents were explained with the aim of the study and provided with the questionnaire. After willingness, questionnaire was filed up. The wealth of information was subjected to summary sheet in excel spreadsheet and later transferred to statistical package.SPSS 20 was employed to generate meaningful information using descriptive and comparison analysis.

3.RESULTS

Farmers (AF and NAF) were compared for their perceptions regarding constructs of Theory of Planned Behaviour (TPB) viz-a-viz, Attitudes [(Belief strength bi x outcome evaluation ei)] regarding advantages/ disadvantages of growing trees on their farms, Salient referents [Subjective Norms (Normative beliefs nb x Motivation to comply mc)]

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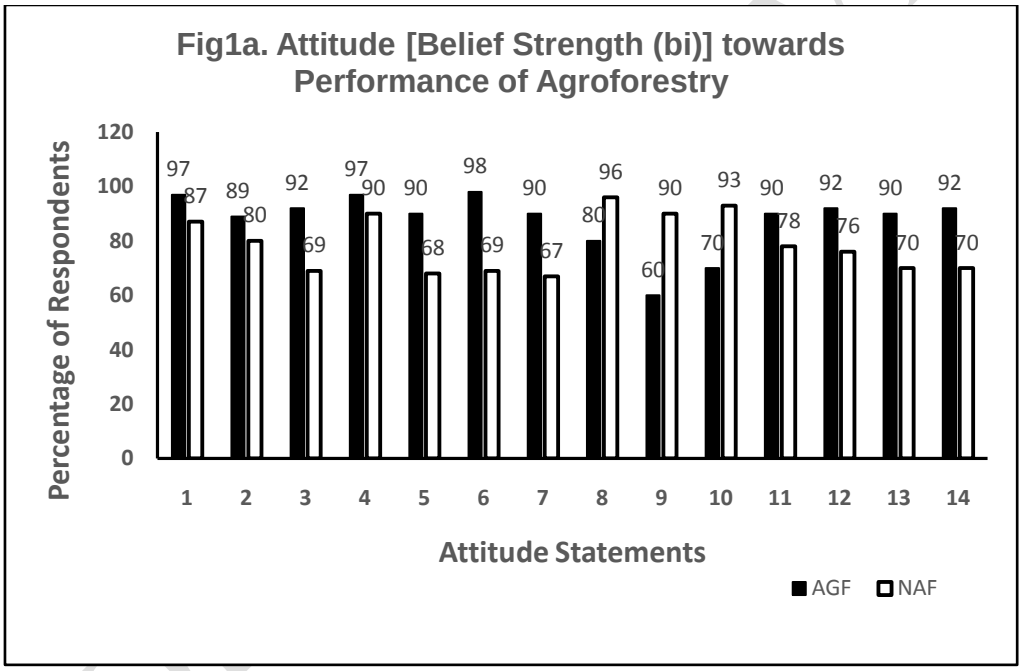
whose approval/disapproval matters and Perceived Behavioural Control [Control beliefs cb x Power of control beliefs pb)] how easy or difficult farmers perceive to practice agroforestry.

3.1. Attitudes

Fig-1a-b shows how AF and NAF perceive growing of trees with respect to 13 attitude statements. When it comes to advantages/ disadvantages of trees, AF significantly perceive agroforestry can provide more income, provide shade for animals/humans, provide a control to soil erosion, increased supply of timber, fuel wood and fruits, having



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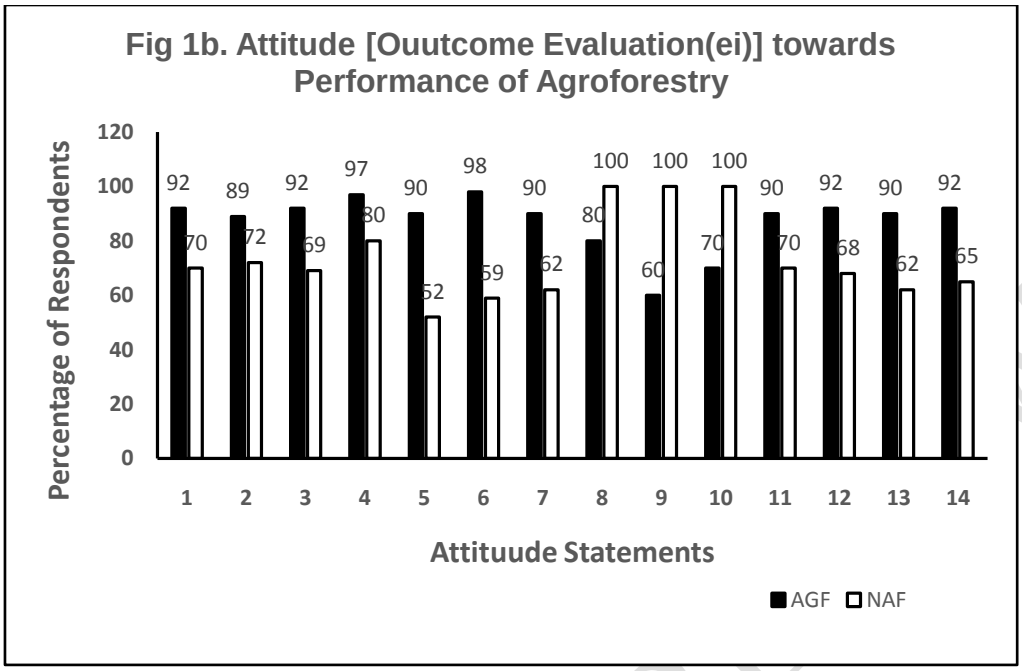

Fig 1a-b: Showing Attitude statements [Belief Strength (bi)] and [Outcome Evaluation(ei)] regarding 14 statements [1-Income increase; 2-Provision of shade; 3-Control of erosion; 4-Provision of timber and fuelwood; 5- Provision of fruits and fodder; 6-Provide control to pollution; 7-Making soil healthy for crop production; 8- Causing hindrance to agricultural operation; 9-More costly enterprise; 10-Cause shade decreasing crop yield; 11-Harbour pests damaging crops; 12-Conserve biodiversity; 13-Resolve issues of deforestation and 14-Provide more jobs].

good control over pollution, making soil health and fit for growing crops, conserve biodiversity and resolves deforestation issues along with creating more jobs than NAF whereas, NAF perceived disadvantages of tree growing is a costly venture, harboring pests causing damage to their agricultural crops, provide unhealthy shade to restrict crop growth as well as obstruct machinery movement for agricultural operation more than AF.

3.2. Subjective Norms (SN)

Fig-2a-b shows how AF and NAF weigh approval or disapproval of their salient referents. Growing trees on their farms, AF value opinion of head of village, fellow farmer, and Forest more than NAF who believed more on Agriculture Department and tenant regarding decision to grow trees on farmlands, whereas regarding family both

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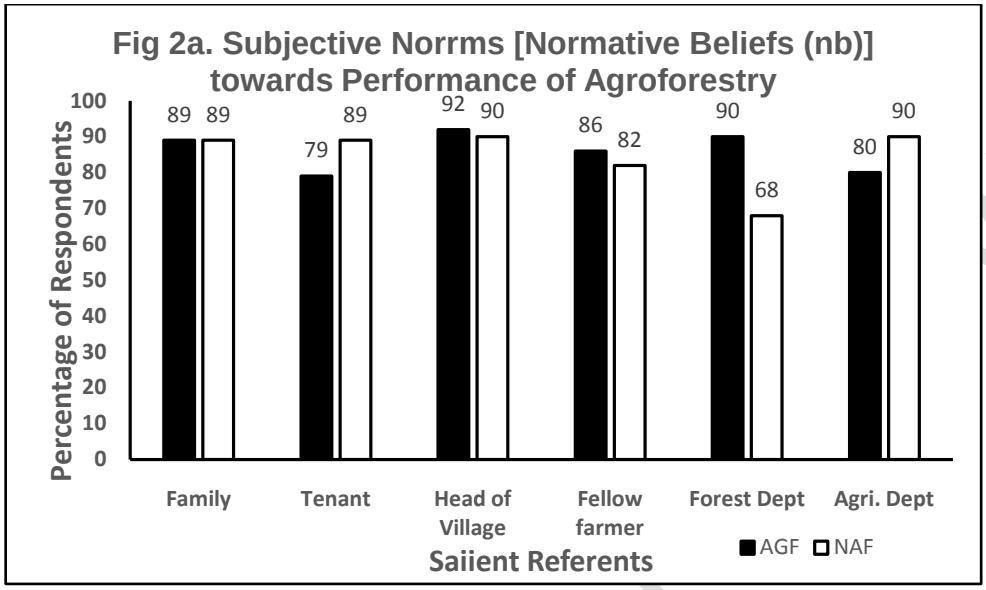
groups are at par. When it comes to comply to the opinion of salient referents AF comply more to all salient referents than NAF while practicing agroforestry.



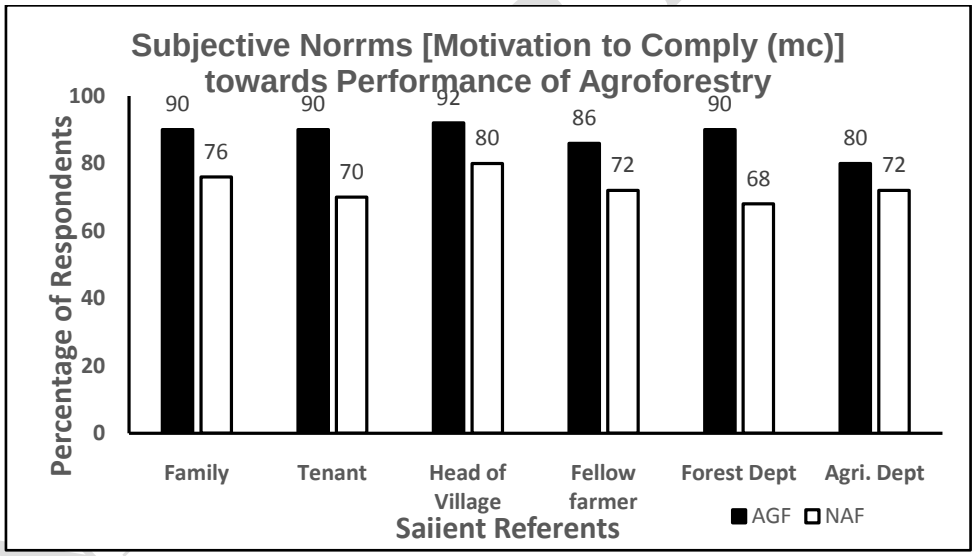
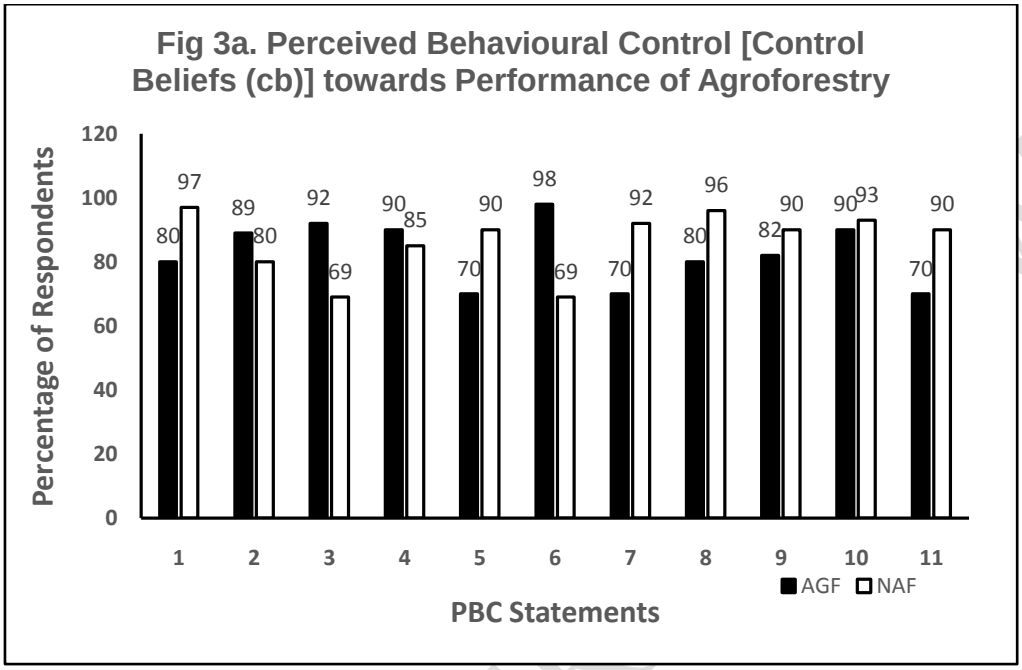


Fig 2a-b: Showing Subjective Norms [Normative Beliefs (nb)] and [Motivation to Comply (mc)] regarding 06 Salient Referents.

3.3. Perceived Behavioral Control (PBC)

Fig-3 a-b showing Perceived Behavioral Component of TPB showing How easy and difficult AF and NAF feels while growing trees on their farms. Regarding PBC, NAF

perceived more difficulty in 07 out of 11 statements than AF while practicing agroforestry.



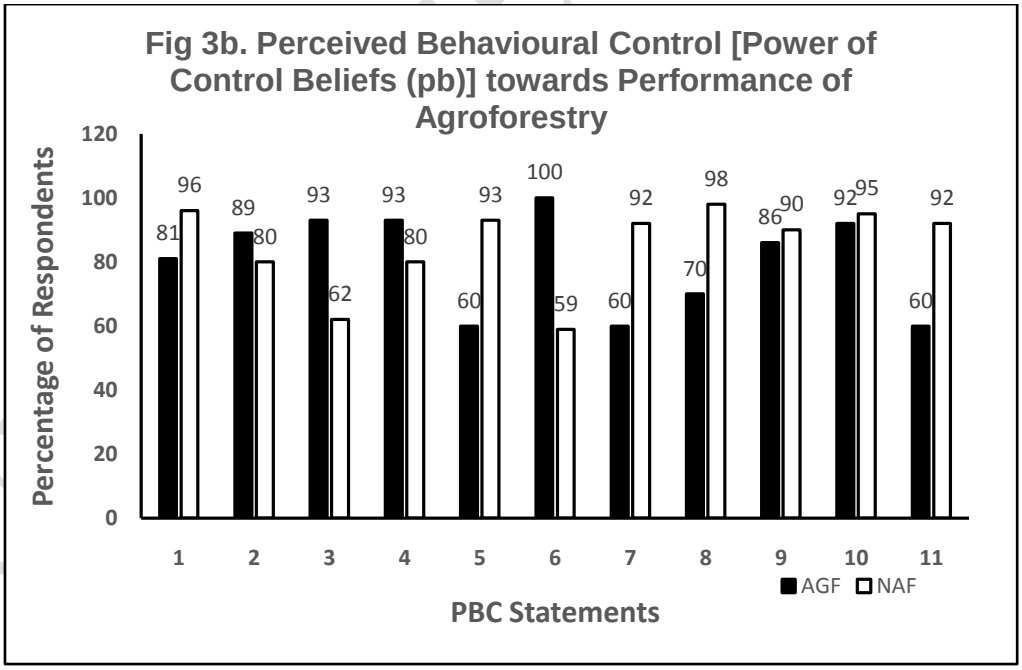


Fig 3a-b: Showing PBC statements [Control Beliefs (cb)] and [Power of Control Beliefs (pb)] regarding 11 statements [1-Allelopathic effect of trees on crops; 2-limited availability of agroforestry extension services; 3-limited market opportunities; 4-lack of required resources for

agroforestry; 5- More labour requirements to grow trees; 6-Long growing period for trees; 7-Costly enterprise; 8- Limited tree nurseries; 9-Lack of legal framework and support; 10-Aridity of the climate and 11-Trees require more water].

3.4. Intentions to Adopt Agroforestry

Fig-4 showing how TPB various constructs contributed towards formulation of positive intention to adopt agroforestry. AF showed positive attitude perceiving advantages of practicing agroforestry more than disadvantages, value opinion of salient referents and showed more compliance towards growing trees and feel more ease than difficulty than NAF to adopt agroforestry on their farmlands.

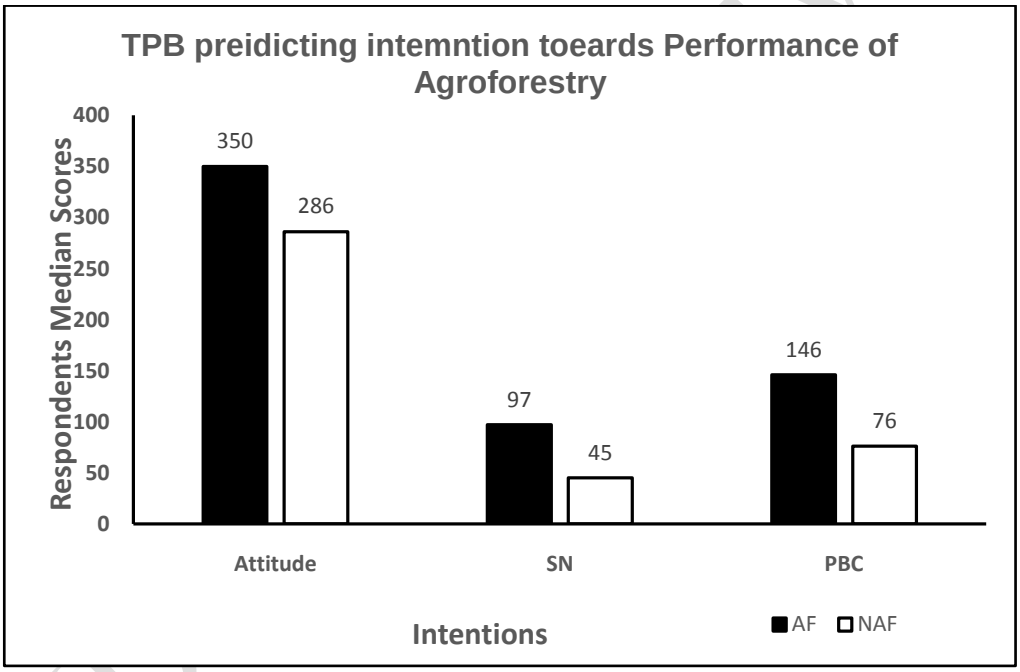


Fig-4: Intention to perform agroforestry as explained by constructs of TPB

4. DISCUSSION

TPB is important and effective model having predictive validity to a behavior, as in present research wherein successfully predicted how adoption of agroforestry can successfully bepredicted from its constructs like attitudes, subjective norms, and Perceived Behavioral control underpinning their beliefs. Farmers (AF) have more positive attitudes than NAF in perceiving the advantages of growing trees more than

their disadvantages as explained by their belief strength and outcome evaluation. Similar results were presented by [4,9]explained that farm level tree planting in Pakistan. successfully explained by the variables of the TPBwherein farmers advantages of growing trees overcome their perception of disadvantages and feel more social pressure to grow trees. Besides TPB effectively explained behaviors predicted from the constructs of the theory. For instance [7] explained how TPB remained useful in understand small farmers behavior to diversify their agricultural production. Farmers intentions to accept water policy were better explained by the TPB and SEM in Lake Urmia Iran [10]. Similarly, [11] explained predictive validity of extended TPB towards forest conservation behavior.

5.CONCLUSION

Since TPB is useful in identifying beliefs underpinning attitudes, SN and PBC constructs of TPB, valuing and weighing such perceptions will be helpful in designing and promotion of tree planting campaigns and adoption of agroforestry in the region. Moreover, identified disadvantages shall also be helpful in resolution for effective adoption.

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