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# IMPACT OF AGROFORESTRY EDUCATIONAL PROGRAM: A CASE OF SMALL-SCALE HOLDERS

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**ABSTRACT:** *Agroforestry is a sustainable land-use system that offers multiple benefits compared to sole operation of its components. Tuskegee University Cooperative Extension in collaboration with the 1890 Agroforestry Consortium developed a training handbook and educated 50 farmers, forestland owners, community educators, and professionals to implement and expand agroforestry practices in the Southeast. An impact assessment was carried out to measure the changes in people's knowledge, attitude, behavior, and condition. An online SurveyMonkey, field visits, and follow-up communications were introduced to collect data. A descriptive and correlation analysis were carried out to assess impact of the program. Results showed that 100% of respondents greatly strengthened their knowledge concerning agroforestry practices, 60% of the respondents applied the acquired knowledge, 50% adopted agroforestry practices, 70% diversified the sources of income, and 537 people were benefitted through spillover effect. Agroforestry operation enhances land use efficiency, diversifies income sources, and increases socio-economic and environmental benefits.*

**KEYWORDS**: Socio-Economic Impacts, Training-of-Trainers, Knowledge and Skills, Income Diversification, Financial Risk Reduction

## INTRODUCTION

Agroforestry systems have unique characteristics that consist of silvopasture, forest farming, alley cropping, windbreak, and riparian buffer. Any of these systems has multiple advantages over the sole system of 'forest/timber' production. According to Godsey (2010), agroforestry as a whole has a long planning horizon, irregular cash flows, and a fixed tree component with variable crop or livestock components. However, a seasonal or annual cash flow is very important to get a system going and to compare the revenues of different agroforestry systems (crops and livestock) between the successive years until the final harvest of the tree component.

Farmers and forest landowners can obtain increased economic benefits by adopting agroforestry practices relative to their existing monoculture operations (forestry, crop, or animal production). The input costs of the farm operation go down as agroforestry diversifies farm enterprises. The returns to agroforestry practices are sometime highly sensitive to the timing and quality of certain practices, such as pruning, introduction of medicinal plants, and other enterprises depending on local environments. Measells et al. (2005) explain that forest resources are important economic assets to the southern United States; however, many landowners do not realize the full benefit of their forestland. Likewise, Karki et al. (2016) stated that "Agroforestry is a sustainable land-use system that involves an intentional integration and



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management of trees, crops, and/or livestock in a single management unit." Well-managed agroforestry systems offer more economical, environmental, and social benefits compared to monocultures of their components. Continuous research, education, and extension efforts are necessary to promote agroforestry practices."

## LITERATURE REVIEW

As stated, agroforestry consists of silvopasture, forest farming, alley cropping, windbreak, and riparian buffer. The literature review reflects one or more of these systems. Trozzo, et al. (2014) shows that future agro foresters may in large part consist of owners that have recently acquired land and manage their property more extensively with higher discretionary income and multiple objectives in mind. The authors further explain that silvopastoral systems are designed to produce a high-value timber component, while providing short-term cash flow from a livestock component. Well-managed silvopasture offers a diversified marketing opportunity that can stimulate rural economic development, while sustaining ecosystem services. Similarly, Stainback et al. (2004) states that silvopasture can reduce phosphorus runoff from cattle ranching –a major environmental concern. It can also sequester carbon, thereby offsetting global climate change. According to them, phosphorus taxes alone would not induce landowners to adopt silvopasture. However, payments to landowners to sequester carbon, alone or in conjunction with phosphorus runoff taxes, can make silvopasture financially competitive with traditional ranching.

The profitability of silvopastoral systems is comparable to other land use systems. Silvopasture further provides opportunities for incorporating wildlife-related activities through hunting leases and possesses both quality and quantity of wildlife habitat not available in other systems. On average, the inclusion of hunting increases land expectation value from 3.1% - 30.6% per acre over a range of lease and interest rates. Thus, silvopasture is an environmentally and economically feasible alternative to traditional land uses (Husak and Grado, 2002). Similarly, Zinkhan and Mercer (1996) reveal that the survey indicates that silvopastoral systems are the most common form of agroforestry in the region. Increased economic returns, diversification, and enhancement of the timing of cash flows were the most frequently mentioned benefits associated with the establishment of silvopastoral systems.

Measells et al. (2005) found that 75% of forest landowners were deemed underserved. According to the authors, landowners stated the main reason they had not taken advantage of these programs or services was because they were unaware of the agroforestry programs. This indicated a need for more comprehensive outreach efforts targeting landowners. Dwivedi et al. (2016) states a policy change coupled with a more targeted and personal outreach approach focusing on capacity building of African American family forest landowners is needed to increase their participation in federal landowner assistance programs.

As Nyakatawa et al. (2012) describes, agroforestry presents an opportunity to increase land productivity and improve cash flow by combining income from crop or animal production and forestry on the same land, along with numerous environmental benefits such as increased diversity of plants and animals, nutrient recycling, erosion control, and carbon sequestration. On the same grounds, Schoeneberger (2009) also illustrates that agroforestry is an appealing option for sequestering carbon on agricultural lands because it can sequester significant amounts of carbon while leaving the bulk of the land in agricultural production. Montagnini



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and Nair (2004) mentions that agroforestry has importance as a carbon sequestration strategy because of carbon storage potential in its multiple plant species and soil as well as its applicability in agricultural lands and in reforestation. In order to exploit this vastly unrealized potential of carbon sequestration through agroforestry in both subsistence and commercial enterprises in the tropics and the temperate region, innovative policies, based on rigorous research results, have to be put in place."

Husak (2000) explains that agroforestry systems yield comparable monetary returns to monocultural systems throughout the United States as they provide both wildlife-related activities and wildlife benefits for landowners and society. The advantages of agroforestry are also explained by Cubbage et al. (2012), that "there might be more loss in crop and silvopasture production with loblolly, however, and production of pine straw for longleaf or game mast for cherry bark oak may offer other benefits. The results support the merits of agroforestry systems in the upper South to diversify income and reduce financial risks."

Workman et al. (2003) indicates that the extent of alley cropping, forest farming and silvopasture practiced by landowners was less than anticipated, and that the prominence of windbreaks was overlooked by professionals. Managed riparian forest buffers or streamside management zones and windbreak technologies were the most widely used forms of agroforestry in the study area, although landowners did not recognize the influence of agroforestry practices on quality or quantity of water among benefits of highest importance to them. According to Alavalapati et al. (2004), "Agroforestry systems (AFS) provide a mix of market goods and nonmarket goods and services. We postulate that if nonmarket goods and services can be internalized to the benefit of landowners, the adoption of AFS will increase. It has been found that the profitability of silvopasture would increase, relative to conventional ranching, if environmental services are included."

## Conceptual Framework

The study followed a five-stage model of the adoption process developed by Rogers (2003) that consist of i) Knowledge transfer, ii) Persuasion, iii) Making application decision, iv) Implementation of the acquired knowledge and skills, and v) Confirmation of the application by the participants. According to the model, an individual, when exposed to an innovation, gains an understanding of how it functions followed by forming a favorable/unfavorable attitude towards the innovative activity, making a decision of adoption or rejection, implementing the new activity into practice, leading to seeking reinforcement of an innovation-decision already made.

## Analytical Approach

*Before versus After Approach* uses base-line information of the farmers who were involved in the Agroforestry Educational Program (AEP) before it was introduced, and compares their knowledge, skills, perception, attitude, income and activities implemented on the field with the current conditions of the same farmers. Figure 1 depicts a vector of a change of the trainees before the Agroforestry Educational Program was implemented (denoted by A) and the level of changes of the same farmers/personnel/trainees at the present condition due to the Agroforestry Educational Program (denoted by B). Thus, the difference between these two points (B-A) reflected a desired situation through this intervention.



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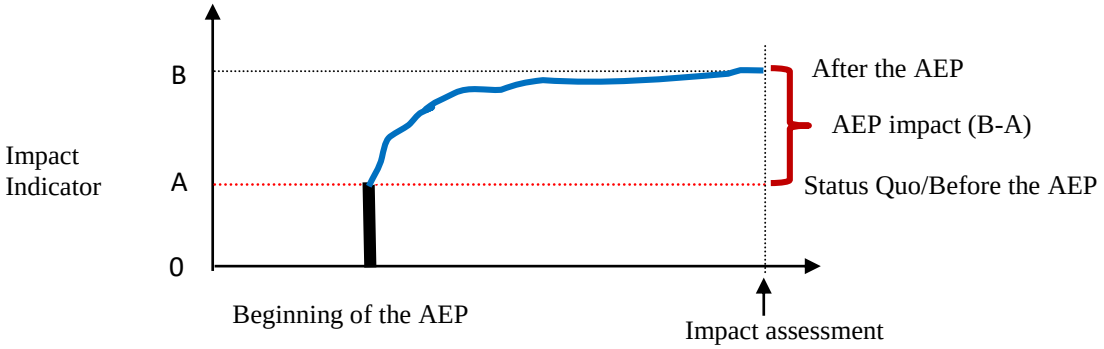


**Figure 1. An Illustration of the Before vs. After Impact Assessment Approach**

*Source: Modified from Bauer (2001)*

## METHODOLOGY

Many farmers, producers, and forestland owners in the southern region could not increase the income from the forestland/timber alone mainly because they do not have required knowledge and skills about agroforestry systems. To reduce the knowledge gap of these clienteles, Tuskegee University Cooperative Extension (TUCE), along with its consortium partner institutions (Alabama A&M, Alcorn State, Federation of Southern Cooperatives, Florida A&M, North Carolina A&T), organized the Agroforestry Educational Program (AEP) in Alabama (Figure 2).

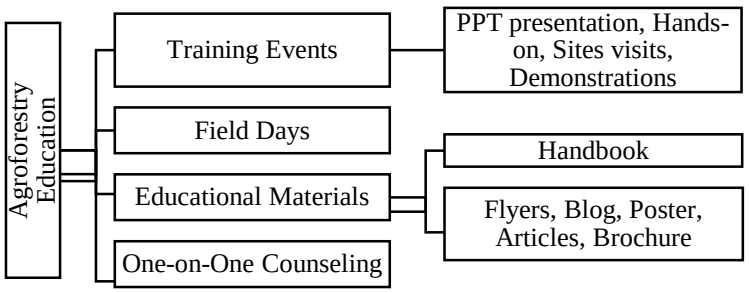


**Figure 2. Agroforestry Educational Program**

Figure 2 depicts a summary of project activities implemented in a package. Besides the training activities, the trainees were also provided with a series of consultations through email, letter, blog, public media, personal contact, random farm visit, and telephonic communications to enable them to introduce at least one of the agroforestry approaches. The study was conducted to assess the impact of such 'agroforestry educational activities (Figure 2) that applied the following procedure:



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### Follow-up and monitoring

We compiled the list of all trainees (farmers, forestland owners, professionals, and students) and constantly monitored and communicated the objectives of the study, nature of responses, implication of the findings, and procedure of the impact assessment with them. Additionally, the project team maintained a close contact with all the trainees; informed them to regularly check updates in the blog, email, and communicate if they had any questions. Similarly, we also provided required technical information with them through emails, texts, in person contact and over the phones. The study team also visited a few of trainees randomly to observe the application of their knowledge and skills on the agroforestry field.

### Survey questionnaire

We designed a structured survey questionnaire referring to the Agroforestry Educational Program that was implemented to the targeted clientele groups. The questionnaire consisted of yes and no, multiple choice, numerical, opened and closed types of questions.

### Data collection and analysis

We introduced online SurveyMonkey to design the questionnaire and collection of data. We emailed the survey to all the trainees, kept on reminding through emails and phone calls (as possible) consistently to have a good representation of all respondents in the survey. Additionally, we visited a few fields (locations) to observe, verify, and collect data. We processed and analyzed the collected data using SurveyMonkey wherever possible. In addition, we applied Excel and SPSS for further analyses.

## RESULTS AND DISCUSSION

Of the total 50 identified trainees of the program, we received 67% responses i.e., 30 respondents. A few professionals, farmers, and students could not respond because of their relocation and inability to apply the acquired knowledge in the practice.

### Participation in agroforestry training

Figure 3 reveals the frequency of training events (five slots) conducted. All training events focused on reducing the wide knowledge gap of the clientele by strengthening the technical and managerial knowledge and skills of the trainees on agroforestry operation in Alabama. Data showed that 43% of the total respondents participated in only one training whereas 3% of the respondents repeatedly participated in all five training events. The trend of participation by the same trainees seemed inversely related to the frequency of the training events. This implies that as the knowledge and skill of the trainees increases the participation in the training program decreases. According to 3% recurring trainees, they benefitted from participating in all training events because each time there were some new concepts/tools/techniques introduced.



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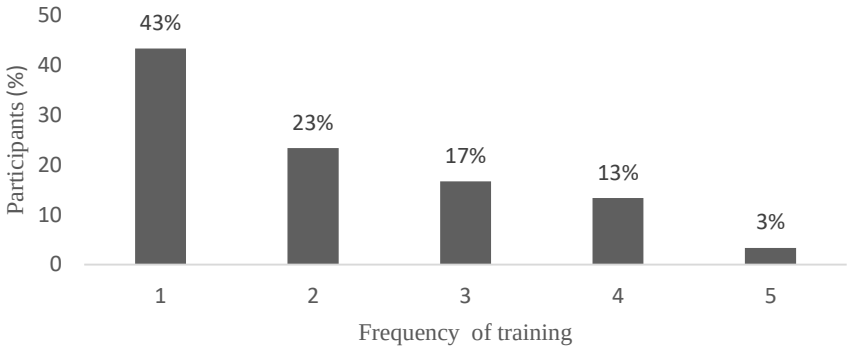


**Figure 3: Frequency of agroforestry training and level of participation**

## Knowledge and Skills Transferred

The results in Table 1 reveals respondents' increased level of knowledge and skills on agroforestry in general immensely. The contents of the training events were grouped mainly in six major areas of knowledge base (Table 1). Almost all respondents reported a huge amount of knowledge and skills gained after participating in the training programs. The changes in knowledge and skills after participating in the training seem to be very substantial in agroforestry operation and practices as the percentage of respondents was very high (88% and above). Of the six major areas included in the training programs, 94% of the respondents gained an extensive amount of knowledge and skills in the areas of plantation and management, forage selection and establishment, and farm enterprise diversification. Likewise, 88% of the respondents enhanced the level of knowledge and skill in the areas of silvopasture systems, sustainable grazing management, and economic benefits/income diversification from the agroforestry operation.

**Table 1: Knowledge and skills gained from agroforestry training sessions**

| Knowledge and Skills type | Respondent (%) |
|---|---|
| ▪ Silvopasture systems | 87.6 |
| ▪ Plantation and management of trees | 93.8 |
| ▪ Forage selection and establishment | 93.8 |
| ▪ Sustainable grazing management | 87.6 |
| ▪ Economic benefits and income diversification of agroforestry systems | 87.6 |
| ▪ Integration and diversification of various fam enterprises | 93.9 |

## Adoption and improvement in agroforestry systems

As a direct impact of the educational program, 50% of the total respondents adopted and/or improved agroforestry systems (Figure 4). The rate of adoption varied according to agroforestry types i.e., silvopasture, forest farming, alley cropping, and riparian buffer. No one reported about the application of windbreak at the time of the study. A majority of the



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respondents (50%) adopted and/or improved silvopasture systems. Similarly, the minority of the respondents (3%) adopted and/or improved riparian buffer.

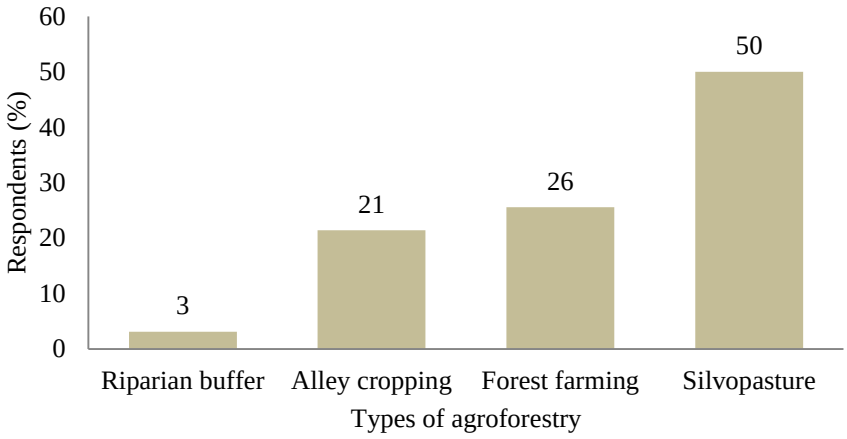


**Figure 4: Types of adoption/improvement in agroforestry systems**

Silvopasture systems seemed to have been practiced by the majority of the respondents followed by the forest farming and alley cropping. According to the respondents, these forestland owners would like to introduce medicinal plants such as ginseng (*Panax quinquefolius)*, black walnut (*Juglans nigra L.)*, goldenseal (*Hydrastis Canadensis L.)*, black cohosh (*Actaea racemosa L.*), vanilla leaf (*Achlys triphylla*), fringe tree (*Chionanthus virginicus* L.), round leaf sundew (*Drosera rotundifolia)*, queen's delight (*Stillingia texana* I.M. Johnst), yellow root (*Xanthorhiza simplicissima*), Canadian licorice-root (*Ligusticum canadense* (L.) Britton), true unicorn root (*Aletris farinosa*), Hercules' club (*Zanthoxylum clava-herculis* L.) are some of the well-known, and with much potential for commercial production in Alabama.

## Application of agroforestry practices

The results reveal that a majority of the respondents (60%) applied acquired knowledge and skills to establish and/or improve agroforestry practices on the field. As a direct impact of the educational program, 23% respondents brought an additional 147 acres of land under agroforestry practices. After attending the training programs, they planted three major types of tree species: adoption of longleaf and loblolly pine was found 82%, followed by pine and oak (13.69%), and pecan (4.10%). Similarly, as understory crops, they planted cool season (arrow leaf & crimson clover, white & red clover, alfalfa, hairy vetch) and warm season forages (sericea lespedeza, crabgrass, bahiagrass, bermudagrass, dallis & Johnson grasses) to promote the silvopasture system. The plants were introduced, single or in a combination with another crop (ginseng), forages (clover, rye, sun hemp), and trees (fruits, pine, pecan), to improve farming practice. In terms of the introduced animals in the agroforestry systems, 50% of the respondents introduced and/or expanded goats followed by sheep (10%), and cattle (10%). Correspondingly, 30% of the respondents have planned to introduce agroforestry onto their forestland, most preferably forest farming with a few medicinal plants as stated above.



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**Benefits of Agroforestry Practices**

The general feeling of the respondents seemed to be very positive and forward looking in terms of adopting/improving agroforestry practices. All respondents (100%) expressed a positive perception regarding the program. They also highlighted that they were exposed to a new technology and innovation; furthermore, they were acquainted with funding opportunities helping institutions, a peer group and educators. Simultaneously they enhanced knowledge and changed their attitude positively towards existing and emerging agroforestry practices. More specifically, the respondents explained the benefits of the Agroforestry Educational Program in the following areas.

i) Grazing facilities improved/increased

Almost 37% of the respondents said that the condition and management of grazing land were improved. Introduction of goats/sheep/cattle consumed two-thirds of unwanted plants/weeds. Animal feed costs were reduced largely due to increased grazing area and improvement of the quality of existing pasture because of introduction of leguminous forages.

ii) Soil condition (including soil nutrients) improved

Thirteen percent of the respondents mentioned that the condition of soil of the lands converted to agroforestry (silvopasture) practice improved with better soil $p^H$, nutrients availability, organic matter, and moisture content. Additionally, they also reported that the value of land started going up; introduction of browse species is improving the condition, use, utility, and quality of grazing lands.

iii) Farm diversification

Seventy percent of the respondents reported that they benefited and are benefitting from the multiple products offered by the agroforestry systems. While waiting many years to harvest timber, agroforestry operation brought or is bringing annual and/or seasonal products in between such as vegetables through alley cropping, medicinal plants through forest farming, and goats/sheep/cattle through silvopasture that increased and maintained regular cash flows to run the operation. According to the respondents, silvopasture, alley cropping, and forest farming seem to be very useful to introduce onto the forestland. The respondents further explained that they reduced and are on the way of reducing financial risk because of diversification of farm commodities that brought additional incomes. Thirty percent of the participants introduced multiple cropping such as forages, goats, sheep, cattle, and even poultry on the same forestland to minimize the financial risk largely. Specifically, 45% of the trainees were found determined to introduce beekeeping and medicinal plants into their forestland.

iv) Sources of farm income diversified

Farm income of the agroforestry practitioners has increased as reported by 50% of the respondents. Similarly, 70% of the respondents believed that agroforestry practices diversified income sources of the farm. Apart from monetary benefits, 67% reported that agroforestry is the major approach to preserve and conserve the local environment.

v) Capacity building

Most importantly, 100% respondents reported that their knowledge, attitude, skill, and aspiration (KASA) regarding agroforestry practices increased enormously after the training.



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According to 75% of the respondents, the level of KASA regarding selection and plantation of forages, soil testing and liming, integration of plants and animals in the system, and economic and environmental benefits of agroforestry practices strengthened positively. The attitude of 65% of the respondents seems to have been positively influenced by the Agroforestry Educational Program. They explained that knowing details about agroforestry system enabled them to integrate different enterprises such as livestock, trees, pasture, vegetables, fruits, and medicinal plants as per the suitability. In addition, the enhanced technical knowledge about trees and plants identification helped them save animals dying from poisonous weeds, increased biomass production by uprooting non-edible plants, and estimate the carrying capacity of the silvopasture. They also illustrated that the agroforestry training helped them protect young pine trees from goats eating the entire bark to the inner core of the trees.

vi) Working network expanded

The training opportunities opened and widened the door specifically for the participants to establish working relationships with a peer group, educators, and practitioners as reported by all respondents (100%). Accordingly, possibilities of farm diversification, sources of income and a resources utilization pattern have extended due to the established working network.

vii) Spillover effect

In addition to applying the acquired knowledge and skill on establishing and/or improving agroforestry practices on their own operations, the respondents also transferred the acquired knowledge to the people in the community: friends, families, and interested individuals. Respondents created a spillover/percolation impact of agroforestry in the community by sharing knowledge and educational materials, hosting field visits, and providing information regarding the agroforestry training opportunity at TUCE. As illustrated by 57% of the respondents, they transferred acquired knowledge and skills to 115 people. Similarly, educational materials and information (flyers, brochures, website, blog, email, and communication through social media) collectively reached to 202 individuals and dissemination in person to 156 individuals through in-person contact, meeting people in various events (workshops, social gatherings, and community meetings). Correspondingly, respondents directly/indirectly and formally/informally hosted 64 visits (individuals and institutions) on their agroforestry sites.

**Improving Agroforestry Systems**

Respondents suggested that there should be a continuous education in order to make the impact of agroforestry training programs sustainable. They believed that applying acquired skills and knowledge of the training programs improved the production system. Almost 93% of the respondents showed willingness to apply the potential practices explained during the training sessions. All respondents shared their views that all types of agroforestry systems may have equal importance depending upon the local geo-physical setting, family preference, and market demand. All respondents (100%) prioritized the concept of farm diversification on the top, believing in its role in sustaining the farm operations sustainably. Additionally, respondents proposed potential activities to improve the existing agroforestry operations (Table 2).



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**Table 2: Ways of improving existing agroforestry operation**

| |
|---|
| - Add more hands-on activities at the training program. |
| - Reach out to more people and help them improve their operations. |
| - Continue the current practice of organizing training events. |
| - More tours/trips to peer farms and/or selected demonstration sites. |
| - Introduce sharing successful stories and challenges regarding agroforestry. |
| - Explore avenues to diversify farm commodities emphasizing existing agroforestry practice. |
| - Share economic impact of rotational and other grazing systems. |
| - Continuous promotion of agroforestry, displaying its economic importance. |
| - Expand grasses and legumes instead of the pines. |
| - Make educators more knowledgeable and producers more aware of agroforestry practices. |
| - Outreach and facilitate massive introduction of medicinal plants into agroforestry system. |
| - Economic analysis of all types of agroforestry practices. |
| - Keep engaging small farmers to take part in agroforestry. |
| - Help all producers prepare their agroforestry development plan. |

## Perceptions Regarding Agroforestry Practices

We measured respondents' perception on the Agroforestry Educational Program using four vector of variables (Table 3). More than 90% respondents stated either a very good or good perception. Respondents' perception on overall training considering five major thematic areas of agroforestry training events (silvopasture, forest farming, alley cropping, windbreak, and riparian buffer) was highly positive as 94% of them either stated a very good or good response. Similarly, a positive response about knowledge and skills strengthened well was expressed by 93% followed by attitude and behavior (94%), and willingness to apply agroforestry practices (93%).

**Table 3: Participants' perception on the overall Agroforestry Educational Program**

| Activity | Very good | Good | No opinion |
|---|---|---|---|
| ▪ Agroforestry training | 67% | 27% | 6% |
| ▪ Increased knowledge and skills | 73% | 20% | 6% |
| ▪ Positive change in attitude and behavior | 67% | 27% | 6% |
| ▪ Application of agroforestry practices | 73% | 20% | 6% |



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**Major Obstacles**

Despite the intense willingness to apply the preferred agroforestry practice by the trainees, they expressed a few difficulties to implement them (Table 4).

**Table 4. Major obstacles while implementing agroforestry practices**

| Activities/Constraints |
|---|
| ▪ Not easy access to training opportunities. |
| ▪ Requires long-term investment. |
| ▪ Not easy access to working capital/finances |
| ▪ Unaffordable labor and machinery necessary for the agroforestry activities. |
| ▪ Limited land holding for large - scale agroforestry operation. |
| ▪ Per unit value of the matured trees/lumber is very low as compared to the time horizon. |
| ▪ Agroforestry is not in the top priority. |
| ▪ Not much experience about multi-faced agroforestry systems. |

Above all, access to a loan is a cumbersome process due to so much paper work to apply, and personal savings were not enough to invest in this operation. Almost all respondents (98%) reported that they never made agroforestry a priority to introduce and expand because of not enough knowledge and skill about economic benefits of this practice.

**Training Needs for the Participants**

Despite their acquired knowledge and skills from the agroforestry training, respondents stated further needs for training programs. The major topics for which they were willing to participate in further training activities are listed in Table 5.

**Table 5. Types of further needs for training**

| | |
|---|---|
| i. | Soil management (nutrients management) |
| ii. | Land management practices (best use of timberland, forage/pasture production). |
| iii. | Forage/pasture production and management (forage selection, manure and fertilizer application, year-round forage production, biomass calculation, grazing management, carrying capacity of the pasture and agroforestry land, factors determining stocking rate). |
| iv. | Farm financial risks management. |
| v. | Economic analysis of farm enterprises (plants and animals, agroforestry practices), comparative advantages of agroforestry, economic benefits of intercropping (vegetables/herbs) in the silvopasture/forest. |
| vi. | Introduction of edible/medicinal plants in the agroforestry practice. |

**Correlation effects of the Agroforestry Educational Program**

Nonparametric correlation was carried out to investigate the degree of relationships between the Agroforestry Educational Program (AEP) (Figure 2) and desired output variables (Table



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6). The results revealed a positive correlation of the AEP with the application of the acquired knowledge and skills to establish/improve agroforestry operation ($p<0.05$). Similarly, there seems to be a great capacity of the AEP to transfer acquired knowledge and skills for forestland owners, agroforestry practitioners, farmers, and other interested individuals in the community and beyond. Furthermore, a very positive association between AEP trained individuals and spillover impact while could share the educational materials, acquired knowledge and skills, and demonstration of own agroforestry practice with interested individuals in community and their networking to establish and improve agroforestry operation.

**Table 6: Correlation coefficient of agroforestry educational program with desired output variables**

| | | | | | |
|---|---|---|---|---|---|
| Agroforestry educational program | Correlation Coefficient | 1 | | | |
| | N | 29 | | | |
| Application of agroforestry practices | Correlation Coefficient | .670** | 1 | | |
| | N | 29 | 30 | | |
| Knowledge transfer | Correlation Coefficient | .901** | .556** | 1 | |
| | N | 29 | 30 | 29 | |
| Spillover impact of agroforestry educational program | Correlation Coefficient | .993** | .651** | .901** | 1 |
| | N | 28 | 29 | 29 | |

**Correlation is significant at the 0.01 level (2-tailed).

## CONCLUSION AND POLICY RECOMMENDATIONS

The positive impact of agroforestry training on people's knowledge, attitude, skills, aspiration (KASA), and farm income was the desired result of the educational program. Offering need - based training activities, regular follow-up and monitoring of the trained personnel as a continued educational program would help sustain agroforestry by adding the value to the land, minimizing financial risks of the small - scale forest landowners, and increasing farm incomes in the rural Southeast. An extensive outreach to livestock farmers, forest landowners, beginning farmers, and interested entrepreneurs in alley cropping and silvopasture would enhance awareness, knowledge, and skills of agroforestry practices, and contribute to promoting the sustainability of the overall production system.

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