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Agricultural Management Practices of Farmers in the Production of Abaca (Musa Textilis Née) Fiber in Biliran Island, Philippines

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Abstract-The study was conducted to elucidate on the agricultural management of the abaca plant. Data were collected through personal interviews with randomly selected survey respondents using the Field Practices Information Sheet or FPIS (187 respondents). Results revealed that 37 percent of the respondents simply categorized abaca into "*Ihayop*" (to refer to a cultivated abaca plant) or "*Ihalas*" (to represent wild abaca). While fiber quality emerged as the main criterion of selecting varieties to be cultivated, soil type was given the greatest consideration in the selection of farm site. Suckers and corms/seedpieces were chosen for planting materials based on the physical assessment of the sucker and the mother plant, and were planted at different times of the year in various distances. Farmers' lack of technical "know-how" on the proper method of disease control contributed to the spread of the disease. Meanwhile, flower blossom development and leaf inflorescence formation served as indices of full maturity. The hired abaca strippers were either paid based on the agreed sharing arrangement or on a daily wage rate. Majority of the respondents (84%) made use of bamboo poles to facilitate drying and sold their produced dried fibers to the town traders - an average of 166 kilograms.

Keywords- *Abaca Fiber, Agricultural Management Practices*

I. INTRODUCTION

The abaca plant is the source of a fiber having several industrial uses including being a raw material for specialty papers, composites of car parts, cordage and rope, beauty products, clothing and footwear, among others [16]. With 85 percent share of global fiber production, the Philippines is recognized as the abaca capital of the world [15], [11]. Philippine exports of abaca fiber average 13,434 metric tons per annum, with Eastern Visayas, composed of Leyte, Biliran, Samar and Pana-on islands, supplying 39 percent of total production [2].

Despite high demand, abaca production has been relatively stagnant [17]. This is mostly attributed to poor quality of abaca fibers, disease infestation, logistical issues in the supply chain, farmer's non-adoption of recommended technologies, and limited value-adding options at the farm level. In order to assess the constraints and develop new strategies for the attainment of sustainable production and supply of high quality fibers, an in-depth analysis of the various aspects of abaca cultivation and management is being attempted. Specifically, this study aimed to elucidate on the agricultural management of the abaca plant for increased yield and economic upliftment of farmers.

II. RESULTS AND DISCUSSION

A. Selection and Treatment of Planting Materials

Most respondents were able to give the names of the abaca varieties (Table 1). These included *Balunan* (identified by 28% of the respondents), *Inosa* (21%), *Ormocanon* (20%), and *Libutanay* (11%). Thirty seven percent, however, simply categorized abaca into "*Ihayop*" (to refer to a cultivated abaca plant) or "*Ihalas*" (to represent wild abaca). They also revealed that fibers from wild abaca were of poor quality, while those from cultivated plants had higher economic value. For planting materials, 71 percent of the respondents used suckers, while 16 percent used corms or seedpieces. Use of suckers for planting, despite their bulkiness to transport, was based on their higher survival rate, faster growth, and shorter maturity period. Besides, abaca farmers also had an opportunity to assess the quality of the mother plant. Most of these planting materials were acquired from other farmers (67%), from their own farm (22%), or from members of their immediate family (6%). Other famers received planting materials from non-governmental organizations (NGOs) and local government units (LGUs).

TABLE I. CHOICE OF VARIETY AND SELECTION OF PLANTING MATERIALS FOR ABACA AMONG SURVEY RESPONDENTS

Variable	Response Category	% (n=187)
Name of Variety	*Ormocanon* *Inosa* *Balunan* *Libutanay/Niluy-a*	20.32 20.95 28.04 10.70
Type of Planting Material	Sucker Corm/seedpiece	71.15 15.09
Source of Planting Material	Co-farmer Own	66.82 21.93

Selection of cultivars was based on fiber quality, particularly color and tensile strength (83% of the respondents) and height and size of the pseudostems (47%) based on the belief that taller and larger stems, and wider leafsheaths could

produce more fibers, and manual stripping would be easier and more efficient (Table 2).Twenty-five percent of the respondents chose varieties that produced several suckers which provided them with cost-free materials for transplanting. Only 10 percent of the respondents selected varieties based on the fiber yield, and only two percent considered resistance to pests and diseases as basis for selection.

TABLE II. BASES FOR THE SELECTION OF VARIETIES AND TREATMENT OF PLANTING MATERIALS

Variable	Response Category	% (n-187)
Bases for Varietal Selection	Fiber quality Fiber yield Capacity to produce suckers Length and diameter of psuedostems	82.90 9.60 24.60 46.50
Bases for Selection of Sucker	Healthy suckers Sucker that have emerged above ground	50.80 41.18
Maximum Number of Suckers Allowed per hill	3-4 suckers 5-6 suckers Not specified	39.57 41.18 18.18

Chemical treatment of planting materials was not practiced by the respondents because they did not know about such practice, were financially constrained, feared being poisoned, or had no access to these chemicals. In the selection of suckers, 51 percent of the respondents based their decision on apparent health and on the physical appearance of the mother plant. Suckers with large pseudostems, numerous roots, and newly developed leaf shoots were usually considered healthy. Forty-one percent of the respondents selected "*ungki*" or suckers that have already emerged above ground—based on the belief that these were of the right age for transplanting. Respondents reportedly only allowed three to four (40%) or five to six (41%) suckers to grow in each hill. Others did not specify the number of suckers per hill (18%). This practice meant that they thinned each hill regularly to leave the desired number of suckers to mature and be harvested each year.

B. Land Preparation and Field Planting

Preparing the land for the planting of abaca involved either underbrushing or slash- and burn (a practice that is prohibited in areas classified as timberlands).

The top criterion in determining site suitability for abaca cultivation was type of soil (70% of the respondents) [Table 3]. Farmers observed that darker soils were more fertile and of better quality. Other criteria were the type of terrain (22.99%), and the presence of rocks and boulders (6.42%). These preferences could mean that soils of forest farm parcels contained less clay and more sand, with total carbon indicating a slower rate of biomass decomposition at higher altitudes [7]. Availability was another determinant of farm site selection (15% of respondents) considering that abaca farmers cultivated small farm parcels, or had no landholdings at all. Eleven percent of the respondents considered the amount of shade in the area or the presence of canopy cover and exposure to solar radiation, as decision factors in site selection. Research results, however, showed varying effects of shade. For instance, it was reported showed that abaca planted under 50 percent shade had significantly higher fiber yield due to longer, bigger and heavier pseudostems compared to those planted under other light treatments [3].

TABLE III. BASES FOR THE SELECTION OF FARM SITE FOR ABACA CULTIVATION AND PRODUCTION

Variable	% (n= 187)
Availability of Site	14.97
Type of Soil	60.96
Type of Terrain	22.99
Amount of Shade	10.70

TABLE IV. MONTH OF PLANTING AND AMOUNT OF MONTHLY RAINFALL

Month	% (n-187)	Amount of Rainfall
No Specific Month	43.00	
December	12.83	132
January	9.63	180

C. Pest Control

No respondent applied pesticides on their abaca due to financial difficulties, lack of knowledge about the practice, difficulty in accessing pesticides, and non-occurrence of pests. Although more than half of the respondents (55%) reported cases of the abaca bunchy top disease in their farms, they were still able to harvest albeit with decreasing yield (Table 5). Reportedly, the infection started in early 2006. When the infection impacted on their livelihood, ten farmers decided to abandon the crop; and seven farmers completely eliminated the abaca plants and replaced them with rootcrops. To contain and control the disease, a group of farmers rogued and burned the infected plants; others cut the infected plants, chopped them into small portions, and piled the chopped materials in a place outside the plantation. As early as 1984, Fiber Development Authority already advised farmers that infected plants should be chopped, rouged, and burned completely but many farmers lacked information regarding the proper method of disease control. Some 25 percent of the respondents practiced smudging using the adipose tissues of pigs and water buffaloes to drive away pests and vectors of viral diseases.

TABLE V. RESPONDENTS' PRACTICE OF BELIEF SYSTEMS AND PREVALENCE OF DISEASE

Variable	Response Category	% (n=187)
Occurrence of Disease	With disease None	55.08 35.83
Practice of Smudging		24.60

D. Harvest and Post-harvest

With respect to the indicators for harvesting, 67 percent of the respondents looked out for the emergence of blossoms, 51

percent waited for the formation of the leaf inflorescence, and 35 percent for fruit development (Table 6). The first two maturity indicators produced high quality fibers with high recovery rate [13], [10]. Harvesting began with the tumbling of the harvestable pseudostems using a sharp "bolo" or machete, and then topping the leaves (98%). Two percent topped the leaves before tumbling the mature stalks. When the stalks have been cut, the pseudostems were gathered and the leafsheaths tuxied using a tuxying knife. The tuxies were classified according to the position in the pseudostems and then manually stripped in the "*hagotan*". Since an ordinary abaca farmer could not afford the cost of a stripping machine, 42 percent hired abaca strippers to do the harvesting and stripping. Most of the abaca strippers in Biliran preferred to use a stripping knife with 18 serrations even if it produced coarser fiber bundles with lower quality. Reportedly, hand-stripping using a 24-serration knife was more laborious. In one village, the farmers even converted the 24-serration knives distributed by the FIDA into knives with 18 serrations.

TABLE VI. RESPONDENTS' INDICES OF PLANT MATURITY, HARVEST, AND DRYING ACTIVITIES

Variable	Response Category	% (n=187)
Indices of Maturity	Flowering stage Fruiting stage Few leaves forming inflorescence	67.86 35.29 50.80
Topping	After	97.86
Abaca Stripper	Abaca farmer Hired abaca stripper	50.36 42.25
Storing of Fiber After Drying	Practiced Not practiced	55.14 44.86
Place of Storage	At home In a hut	37.97 13.37
Material/s Used in Drying	Bamboo Synthetic rope	83.96 11.76
Type of Trader	Town trader Village trader	85.03 18.72

III. CONCLUSION

Many of the respondents lacked information about many things related to abaca production. Abaca cultivators not only were unable to afford the cost of a stripping machine, but also did not have the "know-how" to do stripping themselves. When the abaca bunchy top disease led to decreased fiber production and resulted to economic losses, farmers' lack of knowledge and information regarding the proper methods of disease control and disposal of infected plants allowed the disease to spread to unaffected areas. The consideration given to soil fertility and quality together with the practice of planting abaca on areas with steep slopes and rolling terrains contributed to the current location of plantations. Maintaining the fertility of soils that had been subjected to intensive cultivation remained a challenge to abaca farmers who had no funds to purchase chemical fertilizers, and who merely relied on the practice of mulching using plant trimmings and discarded tuxied leafsheaths. Harvesting and drying practices of abaca were mainly traditional with stripping still manually done and drying of fibers made by utilizing whatever materials were available in the field, and not by a facility that could help meet quality standards. The lack of proper storage also lowered the quality of fibers. The alteration of the 24-teeth stripping knives distributed by FIDA by the abaca farmers and strippers, would indicate the lack of field consultations, and of communication between program planners and implementers, and abaca farmers and strippers. With only one field person assigned for the whole province, the FIDA Provincial Office could hardly cope with the need to conduct regular monitoring and provide technical assistance to the farmers. If the county's dominance in the world market were to be maintained and strengthened, involvement of the LGUs should be made more significant.

IV. RECOMMENDATIONS

To curtail the spread of infection, information should be disseminated thru trainings and seminars, which could serve as venues for sharing and transferring technical "know-how" in the control of the disease, for raising farmers' awareness to the disease, and for increasing their level of vigilance. Infected abaca farms should be subjected to eradication and disinfection. Distribution of disease-free plantlets should be done and regular visits and close monitoring of the conditions of abaca farms could definitely help cultivators recover from the income losses and regain their interest in abaca cultivation. The lack of proper processing facilities resulted in abaca fibers that did not conform to standard quality requirements. Proper harvest, post-harvest, and drying facilities could produce high quality fibers. However, the adoption of technology by abaca cultivators should be analyzed in order to determine their openness and responsiveness to innovations.

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