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KNOWLEDGE AND PRACTICE OF BANANA GROWERS ON GOOD AGRICULTURAL PRACTICES INPUT FOR STRATEGIC INTERVENTION

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Abstract

This study explored the knowledge and practices of banana growers in Flora, Apayao, regarding Good Agricultural Practices (GAP). It examined the profile, practices, problems, and solutions of 264 banana farmers using descriptive statistics. Results indicate that farmers are typically older, married, secondary-educated, and primarily engaged in farming, with substantial experience and average farm sizes of 2.02 hectares. Despite knowing about GAP, most have not attended relevant training. Farmers are organized into various local associations and engage in practices like selecting planting materials, land preparation, planting, watering, leaf trimming, harvesting, processing, and marketing. The study highlights the need for strategic interventions to enhance GAP adherence.

Keywords: *Banana growers, Good Agricultural Practices (GAP), Strategic intervention, Flora Apayao, GAP adherence*

INTRODUCTION

Banana is one of the most crop fruit grown in the Philippines in terms of volume, value and area of production. It is one of the top agricultural exporters of the country. The fruit is available in all year around and rich in vitamins and mineral, especially in potassium which helps regulate the blood pressure. According to Philippine Statistics Authority (PSA, 2024), banana production was estimated at 2.269 million metric tons. It accounts 0.1 percent from the 2.267 million metric tons output of annual increase in the same period of 2022. Cavendish variety had the highest production of 1.17 million metric tons, which accounted for 51.5 percent of the total banana production and area planted with banana was

recorded at 443.64 thousand hectares. Davao Region ranks first as the top producers with 868.19 thousand metric tons or 38.3 percent share to the total production. Followed by Northern Mindanao 431.86 thousand metric tons (19.0%) and SOCCSKSARGEN with 279.20 thousand metric tons (12.3%). (PSA, 2024).

Flora is basically an agricultural community devoting 72% of the municipality's land area to lowland and sloping agriculture. The topography of the land is ideal for farming. More than quarter of the municipality sitting on lowland plains and rolling/undulating areas of 0-3% and 3-18% slopes respectively, are suitable to

intensive agriculture. Agriculture remains to be the primary occupation of the municipality. The production of banana is one among the agricultural thrusts needing attention today, especially in the province of Apayao where bananas are widely grown. In fact, the Department of Agriculture of CAR recorded in 2021 shows that in the region, Apayao is the top producer of bananas yielding 30,523 tons worth PHP38.6 million from 1,123 hectares of plantation. However, this record refers to the fruits only and other by-products were not explored. Despite the production problems faced by the banana growers, majority of the farmers in selected Barangays are still engaged in this livelihood because of its demand and promising market. Based on field observations and interviews from the farmers, banana is planted in combination of upland rice and corn. Rice is produced as staple food for family consumption, while corn and banana are produced as cash crops or another sources of income.

Just recently, the Department of Trade and Industry (DTI) rolled out skills and techniques training course expressly designed for banana cultivators in the Apayao region of the Philippines. Commencing on the first day of July 2023, the two-day banana cultivation session was facilitated by the Apayao division of the DTI and offered instruction in costing and pricing techniques among other skills to 16 registered members of the Anninipan Planters Development Association situated within Flora's municipal boundaries. The objective of the said training was to bolster the processing abilities of the local farmers and foster economic development among them. The contents of the banana cultivation training centered around converting harvested bananas into a variety of palatable, and market-ready wines. They were taught with the fermentation process, the blending of flavors, and mastering the craft of producing a balanced and fragrant end-product. Likewise, they were taught with the selection of appropriate bananas, fruit handling during processing phases, and the implementation of stringent hygiene and quality control measures in processing.

Good Agricultural Practices (GAP) is a set of standards for the safe and sustainable production of crops and livestock. It plays a crucial role in enhancing food safety by implementing measures to reduce contamination risks in agricultural production. These practices involve maintaining healthy animals, ensuring contamination-free feed and water, and creating optimal living conditions for livestock. It focuses on proactive food safety control measures to prevent crop contamination, including aspects like health and hygiene, water quality, soil supplements, and environmental hazards. Training programs on GAPs have evolved to address increasing buyer and regulatory demands, although the costs of implementing additional food safety practices can be barrier for smaller-scale producers. By adhering to GAP guidelines growers can effectively manage pre-harvest environments to mitigate food safety risks.

It offer various benefits to farmers and the environment. By implementing GAP, farmers can reduce production costs, increase revenue, and profit. It will maintain food safety and preventing crop contamination through proactive control measure. Furthermore, the adoption of GAP contributes to sustainable agriculture by improving soil health, reducing soil erosion, and enhancing water and nutrient management practices. Additionally, GAP encourages the use of conservation agriculture techniques like minimum soil disturbance and crop residue management, leading to higher productivity, cost savings and environmental

benefits. Overall, the key benefits of GAP will increase profitability, sustainable farming practices, enhanced food safety and environmental conservation.

Good Agricultural Practices (GAP) certification is a stamp of safety and genuine freshness (ATI, 2013). The Philippine GAP program is a government certification program with the Department of Agriculture as the certifying body. The enactment of Republic Act No. 10611 otherwise known as "Food Safety Act of 2013" strengthens the food safety regulatory system in the country (Official Gazette of the Philippines, 2013). The GAP standard requires a scrutiny of the history of the farm site and its prior; the type of soil, and its compatibility with crops and seed sources; the judicious use of agrichemicals; the sources of potable water for irrigation and washing of crops; the harvest and post-handling procedures; the health and hygiene of the farmer and handlers, and other factors.

Promoting or implementing Good Agricultural Practices can improve the livelihood of producers and the local economy as a whole, contributing to fulfill national development objectives or sustainable development goals. GAP are particularly important in the banana industry, not only for sustainability of production and minimization of environmental impact, but also to ensure that harvesting, packaging and transport activities are conducted in hygienic conditions in order to deliver safe and good quality fruit to consumers. Moreover, certain activities performed in the sector carry important risks for workers and these need to be addressed to ensure safe and efficient banana production. It will help capacitate the farmers already producing the dollar-earning commodity that is potentially a significant source of income.

Thus, this study aimed to determine the profile, knowledge, practice, problems encountered of banana growers of Flora, Apayao on their farming and extension intervention to address the problems encounter by the farmer for the implementation Good Agricultural Practices.

METHODS AND MATERIALS

The study employed a descriptive research design using a structured questionnaire to assess the knowledge and practices of banana growers on Good Agricultural Practices (GAP) in Flora, Apayao. It encompassed 16 barangays: Allig, Anninipan, Atok, Bagutong, Balasi, Balluyan, Malubibit Norte, Malubibit Sur, Malayugan, Mallig, Poblacion East, Poblacion West, San Jose, Sta. Maria, Tumalunog, and Upper Atok. An interview guide was also utilized during Focus Group Discussions (FGD) to gather additional information. The researcher personally administered the questionnaire, assisting respondents with any questions they found unclear, ensuring a 100% retrieval rate. Frequency counts, means, and percentages were used to analyze the respondents' profiles, including age, gender, civil status, highest educational attainment, occupation, and area of banana production. The data on farmers' knowledge and practices were similarly presented as frequency counts and percentages, while the problems encountered by the banana growers were ranked according to frequency. This comprehensive approach ensured accurate data collection and analysis, providing a robust foundation for identifying strategic interventions to enhance GAP adherence among banana growers in the region.

RESULTS AND DISCUSSION

The results and discussion section presents a comprehensive analysis of the demographic profile, knowledge, and practices of

banana growers in Flora, Apayao regarding Good Agricultural Practices (GAP). It also addresses the challenges faced by these farmers and proposes potential solutions to improve their adherence to GAP.

Profile of Banana Farmers

AGE

Findings revealed that the age of banana growers ranges from 21-40 years old have a frequency of 85 or with a percentage of 32.08%, ranges of 41-60 years old have the highest frequency which is 135 with a percentage of 50.19%. While age ranges to 61-80 years old have a frequency of 45 with a percentage of 16.98%, and age ranges to 81-90 years old shows the lowest frequency of 2 or with a percentage of .75%

GENDER

Males were more dominant than females with a frequency of 140 or a percentage of 53.03% while female show frequency of 124 and a percentage of 46.97%. Hence, there is almost equal participation of men and women in banana production.

CIVIL STATUS

Most of the farmers were married individual where it represents 244 or 92.42%. The single banana growers were 8 or 3.03%, widow were 11 or 4.17% and separated was 1 or .38% while there are 8 of them who are still single. Almost 1/3 of whom are college graduates, and 35.47 percent finished high school. Only 14 respondents reported to have no formal education.

Table 2.a. Profile of the Banana Grower – Respondent in terms of age, gender and civil status

HIGHEST EDUCATIONAL ATTAINMENT

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
AGE	Below 21-40	79	29.92
	41-60	138	52.27
	61-80	45	17.05
	81-90	2	0.76
	TOTAL	264	100.00
	Mean = 48.18		
GENDER	Male	140	53.03
	Female	124	46.97
	TOTAL	264	100.00
CIVIL STATUS	SINGLE	8	3.03
	MARRIED	244	92.42
	WIDOW	11	4.17
	SEPARATED	1	0.38
	TOTAL	264	100.00

Findings shows that 13 or 4.92% were no formal education farmers while 76 or 28.80% of elementary level, 94 or 35.60% finished high school level and 81 or 30.68% finishes college graduate. The findings shows that the highest frequency as to the educational attainment mostly came from the group of secondary level or high school level.

OCCUPATION

The occupation of the respondents shows that most of them were farming with a frequency of 239 or 90.53% while 25 others did not specify their occupations.

HOUSEHOLD SIZE

Findings shows that families of the banana farmers are relatively small with 1-5 members having the highest number of frequency of 222 or 84.09 percent. Followed by 6-10 members of the family with a frequency of 34 or 12.88%, banana farmer with member of 11-15 have a frequency of 7 or 2.65% and the lowest family member was 15-20 members having a frequency of 1 or .38%. This is proven by the mean number of family members of 3.96. Farmers stated that their siblings have already their own family.

Table 2.b. Profile of the Banana Grower – Respondent in terms of education, occupation and household size

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
EDUCATION	NO EDUCATION	13	4.92
	PRIMARY LEVEL	76	28.80
	SECONDARY LEVEL	94	35.60
	TERTIARY LEVEL	81	30.68
	TOTAL	264	100.00
OCCUPATION	Farming	239	90.53
	Others	25	9.47
	TOTAL	264	100.00
HOUSEHOLD SIZE	1-5	222	84.09
	6-10	34	12.88
	11-15	7	2.65
	16-20	1	0.38
	TOTAL	264	100.00
	Mean = 3.96		

FARMING EXPERIENCE

Farming experience of the farmers revealed that 16-20 years of farming have a frequency of 89 with a percentage of 33.71%, 6-10 years of farming have a frequency of 76 or 28.79%, 11-15 years have 53 or 20.08% and 1-5 years of farming have a frequency of 46 farmers or 17.42%. Finding shows that respondent have been in farming for quite some time with a mean of 11.33 years.

YEAR OF BANANA FARMING EXPERIENCE

In the 6-10 and 16-20 years of banana farming experience revealed that there were equal frequency of 82 with a percentage of 31.06%, followed by the 11-15 years of banana farming experience and the lowest years of banana farming experience with 46 of frequency or 17.42%. Findings shows that the year of banana farming experience have a mean of 11.10.

FARM SIZE

There is a wide plantation of bananas in Flora, Apayao, however these are distributed among farmers with a mean of 2.02 hectares. Frequency of 86 or 33.58% that have an area of below 1hectare, 1.1 ha. – 2ha. Has a percentage of 34.85% with the highest frequency of 92.For 2.1ha. - 3ha with a frequency of 64 or 24.24% and above 4ha was the lowest frequency of 22 or 8.33% land area.

Table 2.b. Profile of the Banana Grower – Respondent in terms of years of farming experience, years of banana farming experience and size of farm.

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
ANNUAL INCOME	Below 100,000	48	18.18
	100,001 - 200,000	196	74.24
	200,001 - 300,000	20	7.58
	TOTAL	264	100.00
	Mean = 148,485.3		
MEMBERSHIP OF ORGANIZATION	Yes	215	81.44
	No	49	18.56
	TOTAL	264	100.00

ORGANIZATION OF BANANA FARMER

There are 13 registered organization of farmers in Flora, Apayao. The said organization are registered in Department of Labor and Employment (DOLE), Department of Agriculture (DA), Security and Exchange Commission (SEC), Bureau of Internal Revenue (BIR) and Civil Society Organizations (CSO).

RSBSA

Finding shows that majority of farmers were registered in RSBSA, with a frequency of 249 or 94.32% while 5.68% are not yet registered. The Registry System for the Basic Sectors in Agriculture (RSBSA) is a registry of farmers, fisher folk, and farm laborers that serves as a targeting mechanism for the identification of beneficiaries for different agriculture-related programs and services of the government.

Table 2.b. Profile of the Banana Grower – Respondent in terms of name of organization and RSBSA.

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
ORGANIZATION	Bagutong Flora FIA	2	0.76
	Namnama Ti Tamalunog FIA	18	6.81
	ABANA FA	23	8.71
	Malubibit Sur FA	15	5.68

	Northern Malubibit Norte FIA	10	3.79
	Anninipan SWIP FIA	18	6.81
	Marians FA	14	5.30
	Balluyan FA	25	9.47
	Allig Rice Producer FA	1	0.38
	Mallig FA	22	8.33
	Malayugan Rice Granary FA	31	11.74
	Upper Atok Community FA	25	9.47
	TOTAL	215	100.00
	RSBSA	Yes	249
No		15	5.68
TOTAL		264	100.00

Knowledge of Banana Framers to Code of Good Agricultural Practices (GAP) for Banana Production

Finding revealed that there are 72.73% of respondent were not yet experience to attend any training about Good Agricultural Practices, others stated that they know Good Agricultural Practices because they hear from technician of Local Government Unit, president of associations and friends.

Table 3. Knowledge of Banana Grower- attended training.

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
Attend Training on GAP	Yes	72	27.27
	No	192	72.73
	TOTAL	264	100.00

Table 3.a Knowledge of Banana Grower- about GAP..

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
About GAP	Know about it	234	88.63
	Heard about GAP	219	82.95
	Not Heard	19	7.20
	Don't know at all	45	17.05

Agricultural Practice of Farmers in Banana Farming

Propagation of Sucker

Sucker is commonly used for planting material in banana farm. Findings revealed that respondent have chosen the sword sucker

with a frequency of 92 or 34.85%. For water sucker there are 84 or 31.82% respondent and farmers choosing any sucker have a frequency of 88 or 33.33%. Sword sucker has well base developed, pointed tip and narrow blades while water sucker has small base, less vigorous and broad leaf. However, some of them do not practice selection and they simply do not care about the quality of the planting materials. Most farmers used suckers obtained from own farm, neighbors and other farms.

Variety

Tagalog, Saba or Dippig, Lakatan and Murusa (Latundan) are most common varieties of banana that are planted by the farmers. Tarakitak, which is a variety of banana that cannot be eaten raw, instead it should be boiled and not very common because it has a very low suckering ability, hence only 56 are planting this variety. Respondent stated that they planted the Tagalog, Lakatan and Latundan in their farm.

Land Preparation

The land preparation practices were done by the banana farmers include sipat-sipat (under brushing), kaingin, and spraying of herbicide. Under brushing is the most common practice which was done by 79.25 percent of the banana farmers. Although kaingin is prohibited, there are still 85 farmers who reported to have done it because it is the only way to clear the area for the establishment of banana plantation. The spraying of herbicide is seldom practiced with only 12 farmers who reported to have tried the technology.

Table 4. Practices of Banana Grower.

ITEM	CATEGORY	FREQUENC Y	PERCENTAG E
<i>Propagation of sucker</i>	Sword Sucker	92	34.85
	Water Sucker	84	31.82
	Any of the Sword or Water	88	33.33
	TOTAL	264	100
<i>Variety</i>	Tagalog	205	77.66
	Lakatan	198	75
	Murusa	120	45.45
	Tarakitak	56	21.21
<i>Land Preparation</i>	Sipat- sipat (underbrushing)	210	79.54
	Kaingin	85	32.20
	Spraying with herbicide	12	4.55

Planting

In terms of their planting practices, they do it during full moon according to (88.26%) of the total number of respondents. This is because they believe that planting during full moon can result to bigger fruits. Others pre-germinate the suckers before planting with a percentage of 70.8%. Banana sucker grow better if they are planted during or at the beginning of the rainy season. Other respondent revealed that they practice both if full moon and pre-germinate first before they plant.

Planting Distance

Lakatan, Tagalog, saba or dippig are spaced 3m x 3m while murusa or latundan are spaced 2.5m x 2m because they are smaller or shorter.

Number of Sucker per Mat

It was illustrated that the mean of sucker per mat was 3.53, and sucker was purposed for their planting materials.

Watering Management

Very few farmers practice watering the newly planted suckers, while most of them do not water at all. They wait for the rain.

Fertilization

It shows that no application of fertilizer has the highest frequency of 188 or 71.21%. And apply organic obtained lowest frequency or with a percentage of 6.82%.

De-suckering

De-suckering was remove for their planting materials, it was obtained the highest frequency of 97 or 36.74%, don't remove sucker with 89 or 33.71 and remove sucker if there's disease with 78 or 29.54%.

Table 4.a Practices of Banana Grower Planting

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Table 4.a Practices of Banana Grower

ITEM	CATEGORY	FREQUEN CY	PERCENTAGE
Planting	Full moon	212	80.30
	Pre-germinate first before	185	70.08

	planting		
Planting Distance	Tagalog – 3m x 3m	192	72.72
	Latundan and Lakatan 2.5m x 2 m	145	54.92
Number of Sucker per Mat	1-5	245	92.80
	6-10	11	4.17
	11-15	8	3.03
	Mean = 3.53		
Water Management	Water the plant if in need	5	1.19
	Do not water the plant	8	3.03
	Waiting for the rain	251	95.08
Fertilization	Apply inorganic fertilizer	58	21.97
	Apply organic fertilizer	18	6.82
	No application	188	71.21
De-suckering	Remove sucker for planting materials	97	36.74
	Remove sucker if there's disease	78	29.54
	Don't remove sucker	89	33.71

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
Propping	Yes	77	29.17
	No	187	70.83
Trimming of Old Leaves	Yes	203	76.89
	No	61	23.11
Removing of Male Bud	Yes	197	74.62
	No	67	25.38

Propping

Farmers obtained no to propping with 187 or 70.83%. According to respondent, they only doing propping if there typhoon or if see that the fruit is heavy. And in time of harvesting the pseudo-stem may cut half-way and the half will served as propping if there is typhoon.

Trimming of the Old Leaves

Majority of the banana farmer's practice trimming of old leaves, and removal of male flowers and practically not using insecticide for pest control. One way also to control pest and insect.

Spray of Pest and Disease

The findings shows that farmers are not spraying for pest or diseases encountered with a frequency of 168 or 63.64%. Its show that can easily adopt the guidelines for certification of GAP.

Harvesting

Fruits are harvested green and mature, moreover some of them wait till some fruits are ripen before they harvest. The fruits are sold immediately after harvest. The unsold or reject fruit were given to animals for food.

Marketing

The farmers were immediately market upon harvesting with a frequency of 235 or 89.02%.

Processing

In terms of processing, very few are engaged into banana chips production (25 or 9.43%), cooking banana que (12 of 4.53 %) and 24 or 9.06 % reported to be making vinegar out of reject or rotten fruits.

By-Product Utilization

There are no reported wide scale by-product utilization if not for alternative feeds (swill- binugbog) for pigs. Nearly all of them just leave the trunks (pseudo-stem) to be rotten in between the mats or between pseudostem for additional nutrient after decomposition.

Table 4.a Practices of Banana Grower

ITEM	CATEGORY	FREQUENCY	PERCENTAGE
Water Management	Water the plant if in need	5	1.19
	Do not water the plant	8	3.03
	Waiting for the rain	251	95.08
Trimming of Old Leaves	Yes	203	76.89
	No	61	23.11
Removing of Male Bud	Yes	197	74.62
	No	67	25.38
Spraying Insecticide	Yes	96	36.36
	No	168	63.64
Harvesting	Mature Green	198	75
	Ripen	66	25
Marketing	Market upon harvesting	235	89.02
	Store the banana	29	10.98
Processing	Banana chips	25	9.47

the Fruit	Banana que	72	27.27
	Wine/Vinegar	86	32.58
	None	81	30.68
By-product utilization	For animal consumption	192	72.72
	Let it decay	223	84.47
	Let it decay	223	84.47

Problems encountered by farmers

The problems that came out from the interviews made during the administration of the questions are listed in Table 5 and presented according to rank. The most pressing problem of banana farmers is the pricing of their products. Buyers (or the middlemen) dictates the price of banana, hence the farmers cannot command a good price. They also require (resek or the RR/rapit rapit) which is 10% of the weight of the product. This is reported by the farmers.

The incidence of Bugtok a bacterial caused by *Ralstonia solanacearum* E. F. Smith (Sequeira, 1998) was ranked second as problem of farmers followed by the incidence of banana bunchy top disease. The infestation of bugtok result to hardening of the caramel-textured pulp and ultimately dry rotting of the fruit pulp, which make them reject by the buyers. Same is true for bunchy top which could result to stunted or dwarfed with stiff and brittle leaves and it will never bear fruit.

Fruits of bananas are highly perishable, hence farmers cannot insist on waiting for better buyers or else all will be rotten. They do not practice processing for value-adding practices.

Table 5. Problems Encountered by the banana farmers

Problems	Frequency	Rank
Buyers dictate the price of banana.	264	1
The incidence of Bugtok	238	2
The incidence of Banana Bunchy Top Disease	224	3
The fruits are easily rotten.	105	4
No particular pesticide for banana.	96	5

Conclusion

Based on the above findings, the following conclusion were taken:

The banana farmers are dominantly male, married, most highly educated and middle aged individual, majority were farming, member of organization and RSBSA. However, despite of being high school graduates they have they willingness or interesting to gain knowledge on Good Agricultural Practices basis for their farming.

The banana farmers have their knowledge, practices and some were attended a training on Good Agricultural Practices and others are not yet undergo. And they know already about Good Agricultural Practices because they heard from the technicians, association officers and others, but they refuse to follow.

Good Agricultural Practices is one way of developing the farmers to keep properly the things on the own way to produce a high yield and safe product.

Recommendations

Based on the above-cited conclusion, the following recommendations are offered: The DA personnel should conduct trainings on Good Agricultural Practices for banana production and produce and distribute IEC materials on these practices. Additionally, the DA should establish Techno-Demo Farms as models of Good Agricultural Practices for farmers to follow and conduct trainings on banana processing and by-product utilization.

Declaration of no conflict of interest

The author hereby declares no conflict of interest and this article is her original work.

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