

Carrying Capacity of Farm Tourism Sites: Basis for Ilocos Norte's Sustainable Development Plan



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ABSTRACT: Since the launching of Paoay Kumakaway tourism campaign in 2010, Ilocos Norte has experienced mass tourism and has challenged the province's tourism carrying capacity. This has positively impacted the local economy but feared to have a detrimental effect to the environment when not properly managed. The study therefore aims to determine the current tourism carrying capacity of local farm tourism site. The study specifically looks to evaluate the top farm tourism sites like the REF MAD Dragon Fruit Farm in Burgos and Strawberry, Bugnay Farm in Adams. Aside from descriptive statistical tools, the tourism carrying capacity was computed using the Boullon's Carrying Capacity Mathematical Model. Purposive sampling was used and sample size was computed with a 5% margin of error based on the tourist/visitor arrival derived from the tourist destination. This study suggests the allowable number of visitors as this will not limit the attraction or a place from getting tourists. Results show that the Bugnay farm in Adams can accommodate 1,359 person per day for individual visit or 309 person per day for group visit of 6 members on average. The strawberry farm can accommodate 41,148 person per day for individual visit or 9,057 visitor per day for a group visit of 6 members on average. The REF MAD dragonfruit meanwhile can accommodate a total of 1,592 person per day for individual visit or 407 people for a group visit of 6 members on average. This number has not yet reached the maximum numbers that the facilities can accommodate. Since the farms in Adams and Burgos, are still not extensively promoted as a tourism destination, some management strategies can be applied. This is to increase the carrying capacity and come up with community development that does not compromise the environment, economy and culture and make the visitors visit more comfortable.

KEYWORDS: Tourism, Carrying Capacity, Farm, Ilocos Norte, Philippines

I. INTRODUCTION

With the advent of mass tourism, travel and tourism became a leisure activity to most people who have an interest, time and disposable income. Some countries are opening their gates, limiting barriers of entry and offers cheap holidays to attract more visitors. This can lead to both positive and negative impact to the economy, culture and environment.

The importance of tourism on the economy cannot be over-emphasized. It is one of the very few industries that has been identified as a cornerstone of the Philippine economy [1]. Tourism as a form of development, helps revitalize local economy, provides employment opportunities and have been a major source of income to most of the countries in the world like the Philippines. Tourism provides equal economic and social opportunities down to the lowest economic strata. Not only multinational companies invest in the industry but also the micro, small, and medium enterprises are encouraged to cater the needs of tourists. Ancillary services such as public utility vehicles, banks, retail stores and even sidewalk vendors or peddlers experience the ripple effect of income benefits from the industry. Employment and job opportunities are given at all skill levels – from the top managers or executives down to the skilled workers, the industry provide job opportunities to everybody. In addition, tourism also gives environmental and social/cultural benefit to the community.

Tourism has been referred to as Janus-faced phenomenon – it has the potential to change societies for better or for worse [1]. Culture is one of tourism industry resources as it serves as attraction, thus culture of each place is preserved if not revived. The industry promotes cross cultural exchange to both the tourists and locals.

The environment is one of the three dimensions of tourism. As a tourism resource, the environment affects the quality of tourism experiences. In turn, tourism affects the quality of the environment [1]. Tourism helps a community to improve

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environmental quality such as preservation of important flora and faunas, conservation of natural attractions and even developing land for commercial development.

On the other hand, tourism also has a dark side. If the industry is not managed and planned properly it can cause negative impacts and problems. Tourism’s positive economic impacts are attractive but, in some cases, it also causes inflation and scarcity of resources. As to the culture, commodification is a common problem that is caused by tourism. Commodification refers to turning human relationship into commodity, one example is prostitution. Aside from commodification, tourism tends to take the authenticity and meaning of culture for granted for the tourists’ sake. There are rituals and rites that should be performed in a week or even a month but because a tourist average stay is more or less five days when travelling, then rituals are shortcut just so visitors can witness this cultural treasure. The interaction between tourists and locals may sometimes lead to conflict.

While tourism is relatively a clean industry, tourism can cause significant environmental damage. Moreover, local development policy may sometimes favor meeting the need of tourists at the expense of the environment (Cruz, 2016). Natural resources are taken care of when tourism industry booms in a place yet degradation, pollution and loss of biodiversity occurs when a place is exposed to human activities.

With this, the concept sustainable development in tourism has emerged as a panacea to this problem. Sustainable development has been an emerging trend and tourism stakeholders take part towards this concept. The concept of sustainable development is vital, as it seeks balance to the three pillars of the community.

One of the ways to mitigate negative impacts to tourism is identifying the attractions’ carrying capacity. Carrying capacity is important in many tourism areas, especially now that they are experiencing threat due to anthropogenic interventions, biodiversity loss, and climate change. This approach does not really limit the attraction or a place from getting tourists. It will serve as a guide as to how many people an attraction can handle without contributing to negative effects such as congestion and lessened comfort level and satisfaction of tourists.

Ilocos Norte as an agricultural province created farms that serve as an attraction at the same time. The REF MAD Dragon Fruit Farm in Burgos, Ilocos Norte and a potential strawberry, lychee and bugnay farm in Adams are some of the farm tourism sites in the province. Due to the massive influx of tourists traveling up north it is important to determine the carrying capacity of REF MAD Dragon Fruit Farm and other farm tourism sites in the province to be enjoyed by the future generations, makes it beauty lasting, provide a steady source of income to the local community and ensures high level of visitors’ satisfaction

1.1 Objectives

Generally, this study aims to determine the Carrying Capacity of Dragonfruit Farm in Burgos and Strawberry & Bugnay Farm in Adams, Ilocos Norte. Specifically, it aims to:

1. Identify the profile of the respondents along socio cultural, psychological, and economic consideration.
2. Find out the standard requirements of the visitors along space requirements, size of area used by tourists; hours of operation and hours used by tourist.
3. Know the limiting factors.
4. Derive with Real Carrying Capacity of Farm Tourism Sites; and
5. Suggest management strategies to compromise with the suggested carrying capacity

1.2 Framework of the Study

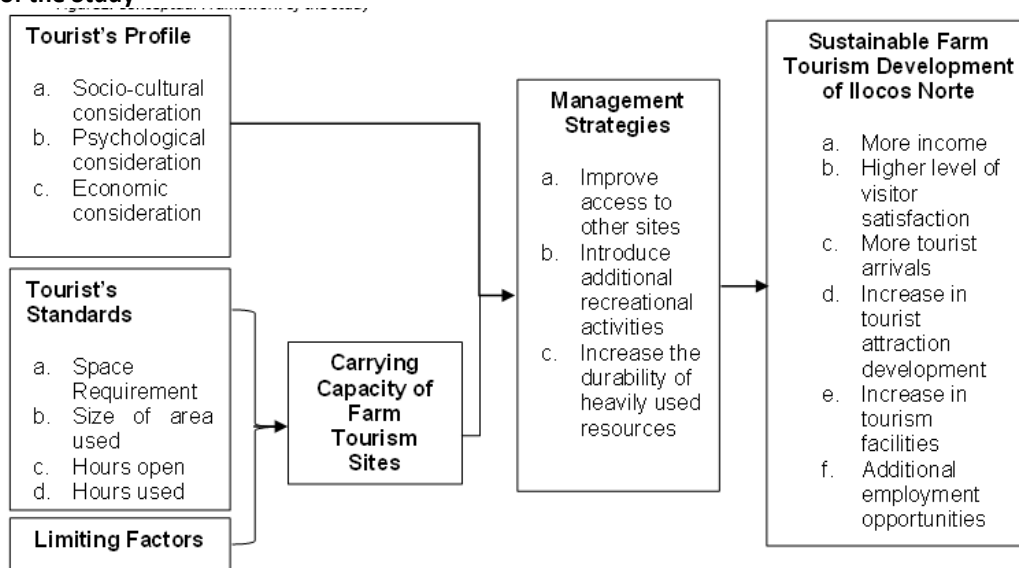


Figure1. Conceptual Framework of the study

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II. LITERATURE REVIEW

A. Carrying Capacity

In the study of Cruz, he highlights that visitors' actions and activities during holidays in attractions, operating sectors such as hotels, restaurants and the like should be managed [1]. Managing visitors' activities is important to attain utmost satisfaction and memorable experience, to protect the property they are in, maintain the quality of environment, protect the natural flora and fauna of the place and save energy. A starting point to manage the impacts of visitor actions and activities is to establish and determine carrying capacity of a place.

Calanog meanwhile discussed that carrying capacity has many variances: (1) Physical carrying capacity – the spatial limitations of an area and is often expressed as number of units that an area can physically accommodate. (2) Ecological carrying capacity – measure of the population that an ecosystem can sustain, defined by the population density beyond which the mortality rate for the species becomes greater than the birth rate. In a recreational context, ecological carrying capacity can also be defined as the stress that an ecosystem can withstand in terms of charging number of visitors or activities before its ecological value is unacceptably affected. (3) Social carrying capacity – a measure of crowding tolerance. It has been further defined by De Ruyck et al. as the maximum visitor density at which recreationists still feel comfortable and uncrowded. (4) Economic carrying capacity – the extent to which an area can be altered before the economic activities that occur in the area are affected adversely. It therefore attempts to measure changes in economic terms [2].

In addition, in the study of Calanog, it presents ways to compute carrying capacity. For tourism purposes, two simple models are applied: the Boullon's carrying capacity mathematical model and the Limits of Acceptable Change. Either one of them may be used depending on the condition of the ecotourism site, the tourism activities and services offered and the purpose for which the carrying capacity is applied [2].

In Boullon's Carrying Capacity Mathematical Model (BCCMM), the carrying capacity is measured at three levels: (1) basic carrying capacity (BCC); (2) potential carrying capacity (PCC) and; (3) real carrying capacity (RCC).

The challenge is how to determine the standard requirement of the visitor. Standard may come in the form of time, space, material, psychological, ecological, and other needs of the visitor. Standards can be derived from secondary literature, say from publications of World Tourism Organization. Another approach in determining the standard is through a survey or personal interview with visitors. In doing so, some parameter should be looked into: (1) Psychological considerations includes visitation in group or individual, reason for coming to the site, recreational activities preferred, facility requirement, equipment brought to the site, parking requirements; (2) Economic considerations includes daily or monthly income, daily or monthly expenditure, specific amount set for tourism activities, source of income and general socio economic status in life whether rich, middle class or poor; (3) Socio-cultural considerations includes demographic profile, number of family members, occupation, organizational affiliation and beliefs and practices relative to tourism activities [2].

Once the standard is set and other relevant data and information are generated the computation of carrying capacity may proceed. In BCCMM, the carrying capacity is measures at three levels: Basic Carrying Capacity (BCC), Potential Carrying Capacity (PCC), and Real Carrying Capacity (RCC).

An alternative way to manage visitor impact is the Limits of Acceptable Change (LAC). Discussed by Calanog (2015), LAC is based on the idea that rather than outing a threshold on visitor number, management of an ecotourism area should be based on constant monitoring of the site as well as objectives for which area is established. The LAC process often includes public input and involvement at key steps.



Figure 2. Limits of Acceptable Change Process

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In the Philippines, there are few attractions that have a determined and published carrying capacity using both the Boullon's Carrying Capacity Mathematical Model and Limits of Acceptable Change and these are the Pamilacan Island of Bohol and Puerto Princesa Underground River of Palawan. According to the project team of CARCAP Pamilacan, the carrying capacity of Pamilacan Island is 22 boats a day or 220 visitors per day in the caution zone using the BCCMM. For the carrying capacity of Puerto Princesa Subterranean National Park, the preferred distance of boats from one another while on cruise are varying from different key informants. From the view or preference of visitors or users the distance between boats is 15 meters, PASUs opinion or view, the distance should be 100 meters apart. When the PASUs' recommendation is reduced to the visitors' preference the computed distance is 42.5 meters. Compromised distance is 30 meters. Moreover, the number of visitors allowed to visit the site in consideration with the LACs are the following: as to the visitors' preferences, 1,456 persons per day will be allowed; for the PASUs' recommendation only 18 person per day are allowed; the difference between the visitor's preference and PASUs will be 34 persons a day and the compromised carrying capacity is 345. With these computations the CARCAP Puerto Princesa team had come up, the management of the site was able to identify a carrying capacity that will meet halfway with all its stakeholders. As of today, the underground river can accommodate 700 persons a day.

In the city of Ramsar, Iran, [3] found out that tourism has caused negative effect in socio-cultural dimension and the quality of tourism experience has decreased due to the rate of tourist arrivals in the city is more than the skeletal carrying capacity of the destination.

On the other hand, the only Safari Park in Bangladesh (Bangabandhu Sheikh Mujib Safari Park), have a maximum average number of tourist of 5,000 a day which is relatively below the physical carrying capacity which is 17,300 with a rotation coefficient of 3.46. Moreover, the social carrying capacity is 4.38 person per day [4].

In Kaziranga National Park, psychological carrying capacity was employed and in order to derive the PCC, social norm curve was utilized. It was found out that tourists are satisfied if they meet less than 18 jeeps during the whole trip of the Kohora range.

Water Carrying Capacity of China is also studied [5], it was found out that the water resources do not match with the distribution of the population and with the state of economy. Chinese southwestern provinces have a relatively large potential of water carrying capacity. The Yangtze River basin, the Pearl River basin and the eastern coastal areas no longer possess an advantage in the water carrying capacity. Some regions, such as the North China Plain, and Northwestern China, e.g. Xinjiang Uygur Autonomous Region, Ningxia Hui Autonomous Region, and Gansu Province experience severe shortage of water resources, since the water supply system is overloaded.

B. Management Strategies

The concept of carrying capacity is to control the influx of visitors coming into the site for cultural and environmental preservation and protection. However, the economic benefit is left out. To create a balance with these three pillars of sustainable tourism, strategies can be adopted to cope with the limitations of carrying capacity.

According to Calanog [2], the following are strategies can be applied in increasing the carrying capacity of an ecotourism site: (1) Re-design the facilities to accommodate more visitors or activities. (2) Increase the durability of heavily used resources. (3) Improve access to other sites of interest. (4) Introduce additional recreational activities to distribute visitation or concentration in an area.

Zoning is another management tool to implement carrying capacity as proposed by Cruz (2016). This tool is applied mainly to protected areas and there could be four zone categories.

C. Sustainable Tourism

In 1987, adopting the parent concept of sustainable development, the UNWTO defined sustainable tourism as the management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems. It is the tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities. In simple language according to Cruz [1], it means that tourism should be developed without damaging or exhausting finite natural or cultural resources so that those who will come after us may also have opportunity to enjoy them. Sustainable tourism development is supported by the triple bottom line of environmental conservation, social justice and economic viability. Sometimes, this triple bottom line is known as People-Place-Profit, we can also call it Equity-Environment-Economy. It is a form of tourism that respects local culture, protects nature and advocates social responsibility and fair commerce.

For tourism to be sustainable, it is essential for the following elements to be present: (1) informed participation of relevant stakeholders, (2) strong political leadership to ensure wide participation and consensus building, (3) constant monitoring of impacts and adoption of preventive or corrective measures when necessary, (4) maintaining a high level of tourist satisfaction

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and providing meaningful experience to the tourists, and (5) raising the tourists' awareness about sustainability issues and sustainable practices. (Cruz, 2016)

III. METHODOLOGY

A. Research Design

The study used the descriptive-survey method of research. Descriptive survey, according to Calmorin [6], it is suitable wherever the subjects vary among themselves and one is interested to know the extent to which different conditions and situations are obtained among these subjects.

The study only considered the tourists visiting Farm Tourism Sites in Ilocos Norte. Sample size was computed with a 5% margin of error based on the tourist/visitor arrival derived from the tourist destinations.

B. Data Gathering Methods

In gathering primary data, structured survey questionnaire and personal interview was employed. Purposive sampling was used in the selection of respondent. Secondary data such as tourism standards, environmental and social data were derived from published and unpublished literature and document analysis was also conducted.

C. Data Gathering Instrument

This study was conducted using a survey questionnaire adapted from the carrying capacity study of [7]. The questionnaire contained personal information of the visitor; perceived visitor standards and perceived limiting factors occurred at the attraction

D. Analysis of Data

Data gathered were combined and presented in tabular, graphical and textual forms. Data is analyzed according to basic statistical descriptive such as percentages and frequency, average and standard deviation using MS Excel. After deriving the mean or average of data, the Boullon's Carrying Capacity Mathematical Model (BCCMM) was utilized to obtain the real carrying capacity.

The BCCMM was measured at three levels: Basic Carrying Capacity (BCC), Potential Carrying Capacity (PCC) and Real Carrying Capacity (RCC).

First level: Basic Carrying Capacity

$$BCC = \frac{\text{Area used by visitors (i. e., in sq. m.)}}{\text{Average visitor's standard (i. e., in sq. m.)}}$$

Second level: Potential Carrying Capacity

$$PCC = BCC \times RC$$

where:

$$RC = \frac{\text{Total no. of hours a specific area is open for use}}{\text{Average no. of hours an area is used by visitors}}$$

Third level: Real Carrying Capacity

$$RCC = PCC \times \frac{100 - lf_1}{100} \times \frac{100 - lf_2}{100} \times \frac{100 - lf_3}{100} \times \frac{100 - lf_n}{100}$$
$$\text{Limiting Factors } (lf_{1,2,3,\dots,n}) = \frac{M_{(a,b,c,\dots,n)}}{MT} \times 100$$

where:

$M_{(a,b,c,\dots,n)}$ = limiting magnitude of the factor/variable

MT = total magnitude of the factor/variable

E. Ethical Consideration

The involvement of the respondents as sources of information were voluntary. For the farm tourism sites, a request was sent to the owners of the identified farm sites for their approval to conduct the study.

IV. RESULTS AND DISCUSSION

A. Respondent's Profile

According to Calanog [7], parameters for the profile of respondents are psychological consideration, economic consideration and socio-cultural consideration. Psychological consideration includes visitation in group or individual, reason for coming to the

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ecotourism site, type of visit, recreational activities preferred, facility requirements, equipment brought to the site and parking requirements. Economic consideration composes of daily or monthly income, daily or monthly expenditure, specific amount set aside for tourism activities, primary/secondary source of income and general socio-economic status in life – rich, middle class, poor. Lastly, the socio-cultural considerations include demographic profile – age, sex, educational attainment, religion, ethnic group and the like, number of family members or household size, profession or occupation, organizational affiliation and beliefs and practices relative to tourism activities.

This section presents the profile of respondents from two (2) municipalities: Adams and Burgos, where the farm tourism sites were located.

Table 1.1. Profile of the respondents in Adams, Ilocos Norte based on socio cultural considerations

Socio-Cultural Considerations		<i>f</i>	%
Country	Philippines	98	94.23
	Abroad	1	0.96
	No Answer	5	4.81
	<i>Total</i>		<i>100.00</i>
Region	1 - Ilocos Region	84	80.77
	2 - Cagayan Valley	6	5.77
	3 - Central Plains	2	1.92
	7 - Western Visayas	1	0.96
	Cordillera Administrative Region	2	1.92
	National Capital Region	3	2.88
	No Answer	6	5.77
	<i>Total</i>		<i>100.00</i>
City/Town	City	32	30.77
	Town/Municipality	60	57.69
	No Answer	12	11.54
	<i>Total</i>		<i>100</i>
Age	Teenage	24	23.08
	Young Adult	67	64.42
	Middle Aged	12	11.54
	Over 65	1	0.96
	<i>Total</i>		<i>100.00</i>
Sex	Male	47	45.19
	Female	57	54.81
	<i>Total</i>		<i>100.00</i>
Religion	Roman Catholic	54	51.92
	Iglesia Ni Cristo	8	7.69
	Aglipayan	21	20.19
	Born Again	13	12.50
	Others	8	7.69
	<i>Total</i>		<i>100.00</i>

Almost all of the visitors in Adams, Ilocos Norte are from the Philippines and there is a lone tourist from abroad, specifically from Hungary. Majority are local tourists, which means visitors are from the Ilocos Region (80.77%), other tourist came from Region 2 specifically from the province of Cagayan (5.77%), Region 3 specifically coming from Bulacan (1.92%), Region 7 specifically from Negros Oriental (0.96%), NCR specifically from Caloocan (2.88%) and CAR specifically from Abra (1.92%). Local tourist were mostly the visitors of the town since it is not yet fully developed and well promoted to both domestic and international tourists. The largest number of domestic visitors came from Region 2 since the town is bounded east by the provinces of Cagayan and Apayao. 57.69% of the respondents reside in towns or municipalities while 30.77% came from the cities.

The young adult population aged 24 to 35 years old (64.42%) has the most number of respondents followed by teenage group aged 10 to 19 years old (23.08%). Considering the topography of the town which consist primarily of mountainous terrain, it requires physical activities that can lead to adventure tourism. Most of the visitors were female (54.81%) while male composes of nearly half of the respondents with 45.19%. Roman Catholic is the religion of the majority followed by Aglipayan (20.19%),

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Christian or Born Again (12.50%), Iglesia ni Cristo (7.69), other religions (7.69%) were Crusaders Divine Church of Christ (CDCC), Mormons and Baptists.

Table 1.2 Profile of the respondents in Burgos, Ilocos Norte based on socio cultural considerations

Profile		f	%
Country	Philippines	61	91.04
	Abroad	6	8.96
	<i>Total</i>		<i>100.00</i>
Region	1 - Ilocos Region	43	64.18
	3 - Central Plains	2	2.99
	4A – CALABARZON	4	5.97
	5 - Bicol Region	2	2.99
	9 - Zamboanga Peninsula	1	1.49
	National Capital Region	7	10.45
	No Answer	8	11.94
	<i>Total</i>		<i>100.00</i>
City/Town	City	15	22.39
	Town/Municipalty	50	74.63
	No Answer	2	2.99
	<i>Total</i>		<i>100</i>
Age	Teenage	4	5.97
	Young Adult	24	35.82
	Middle Aged	15	22.39
	Over 65	24	35.82
	<i>Total</i>		<i>100.00</i>
Sex	Male	35	52.24
	Female	32	47.76
	<i>Total</i>		<i>100.00</i>
Religion	Roman Catholic	40	59.70
	Iglesia Ni Cristo	2	2.99
	Aglipayan	13	19.40
	Born Again	6	8.96
	Others	6	8.96
	<i>Total</i>		<i>100.00</i>

Same with Adams, majority of visitors in Burgos are from the Philippines (91.04%) while the 8.96% came from the countries of Canada, United States of America and Australia. Majority are local tourist, which means visitors came from Ilocos Region (64.18%) followed by visitors from NCR (10.45%), CALABARZON (5.97%), Central Plains (2.99%), Bicol Region (2.99%) and Zamboanga Peninsula (1.49%). 74.63% came from municipalities or towns and only 22.39% lives in the city.

Compared to the visitors of Adams, majority of visitors in Burgos are not just the young adult (35.82%) but also the over 65 age group (35.82%). Since the farm site is accessible to all age group, it also promotes healthy options of food highlighting the health benefits of dragon fruit can contribute.

As to the sex of visitors, Burgos has the same result with Adams that majority are female (52.24%) while male composes nearly half of the respondents with 47.76%. The result on the sex of visitors in Adams and Burgos is supported with the study of Orpia and Bueno (2017) that majority of Ilocos Norte's visitors to top tourist attractions were female. Roman Catholic is the predominant religion of the respondents (59.70%). Other respondents are Aglipayan (19.40%), Born Again/ Christians (8.96%), Iglesia ni Cristo (2.99%) and others (8.96) are Protestant, Islam and Baptists.

Table 1.3 Profile of the respondents in Adams, Ilocos Norte based on psychological considerations

Psychological Considerations		f	Rank
Planned Activities in Adams	Sightseeing	78	1
	Trekking	70	2
	Adventure Tourism	53	3

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	Food Tourism	43	4
	Fruit Picking	43	4
	Swimming	39	6
	Shopping	28	7
	Camping	12	8
	Others	8	9
Activities Undertaken in Adams	Sightseeing	71	1
	Trekking	58	2
	Adventure Tourism	42	3
	Food Tourism	37	4
	Fruit Picking	37	4
	Swimming	26	6
	Shopping	16	7
	Camping	6	8
	Others	1	9
Psychological Considerations		f	%
Manner of Visit	Individual	92	88.46
	Group	12	11.54
	<i>Total</i>		100
Purpose of Visit	Holiday	53	46.49
	VFR	12	10.53
	Business/Profession	8	7.02
	Health/Medical	1	0.88
	Pilgrimage/Religion	0	0.00
	Education	39	34.21
	Others	1	0.88
	<i>Total</i>		100.00
Preferred Activities in the Site (Cardom's & Inuwayan Farms)	Sightseeing	85	38.29
	Fruit Picking	51	22.97
	Creative tourism	45	20.27
	Food tourism	33	14.86
	Others	8	3.60
	<i>Total</i>		100.00
Psychological Considerations		Ave	Use
Facilities Required in the Site	Comfort Room	2	<i>for male and female</i>
	Benches	3	
	Picnic Area	2	
Equipment Brought per person	Cellphone/Smartphone	1	for documentation and communication
	Camera	1	for documentation

Multiple Answers

Table 1.3 present the profile of the respondents in Adams based on psychological considerations. The respondents top 1 planned activities and activities undertaken in Adams is Sightseeing, followed by Trekking and engaging in Adventure Tourism. Other activities which were not listed abovementioned is on work related or data gathering of some researchers. 88.46% of the respondents are Frequent Individual Travelers (FIT) while 11.54% are on group tour. The main reason of their visit is Holiday and Recreation (46.69%) followed by Education (34.21%). Still, majority of the visitors in the farm sites prefers to have sightseeing (38.29%). According to the respondents, the average required number of comfort rooms is 2 used for male and female with maximum consideration of up to 5 comfort rooms, at least 3 benches in each site with maximum consideration 10 benches per site and 2 picnic areas with maximum consideration of 5 to 10 picnic areas in each site. As to the equipment the respondents

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brought, average of one (1) mobile phone with maximum 10 mobile phones brought in the site and one (1) camera used for communication and documentation of their visit.

Table 1.4 Profile of the respondents in Burgos, Ilocos Norte based on psychological considerations

Psychological Considerations		<i>f</i>	Rank
Planned Activities in Adams	Sightseeing	53	1
	Food Tourism	28	2
	Adventure Tourism	21	3
	Shopping	15	4
	Fruit Picking	14	5
	Trekking	11	6.5
	Camping	11	6.5
	Swimming	9	8
Others	8	9	
Activities Undertaken in Adams	Sightseeing	53	1
	Food Tourism	23	2
	Shopping	18	3
	Adventure Tourism	17	4
	Fruit Picking	14	5
	Swimming	11	6
	Camping	8	7
	Swimming	7	8
Others	3	9	
Psychological Considerations		<i>f</i>	%
Manner of Visit	Individual	6	8.82
	Group	62	91.18
	<i>Total</i>		100
Purpose of Visit	Holiday	36	48.65
	VFR	14	18.92
	Business/Profession	10	13.51
	Health/Medical	2	2.70
	Pilgrimage/Religion	1	1.35
	Education	11	14.86
	Others		0.00
<i>Total</i>		100.00	
Preferred Activities in REFMA Dragon Fruit Farm	Sightseeing	52	42.28
	Fruit Picking	14	11.38
	Creative tourism	16	13.01
	Food tourism	23	18.70
	Shopping	14	11.38
	Adventure Tourism	1	0.81
	Agritourism	1	0.81
	Others	2	1.63
<i>Total</i>		100.00	
Psychological Considerations		Ave	Use
Facilities Required in the Site	Comfort Room	3	
	Benches	7	
	Picnic Area	4	
Equipment Brought per person	Cellphone/Smartphone	2	for documentation and communication
	Camera	1	for documentation
	Drone	1	

Multiple Answers

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The same with Adams, respondents in Burgos ranks sightseeing as top 1 planned activities and activities undertaken in the site. In Burgos, food tourism ranks number 2 for both planned and undertaken activities. While adventure tourism ranks 3 in the planned activities, when asked if what activities were undertaken in the site shopping ranks number 3. Other activities which were not listed in the table that visitors plan to do and activities that were undertaken during the visit were for Agritourism, Lakbay Aral, Mountain Biking and Wine tasting.

As to the purpose of visit, most respondents are on holiday and leisure (48.65%) followed by Visiting Friends and Relatives (18.92%). Most preferred activity in the farm site is sightseeing (42.28%) followed by Food Tourism (18.70%) and shopping & fruit picking (both 11.38%). These activities in REF MAD Dragon fruit farm in Burgos were the highlights of visiting the farm. Various delicacies and dishes made out of dragon fruit is served and can also bring home as *pasalubong*.

As to the facility requirement, the average number of comfort rooms required is three (3) with a maximum consideration of ten (10) comfort rooms in the site. Average of seven (7) benches in the site with maximum consideration of twenty (20) benches and Average of four (4) picnic area with maximum consideration of 15 picnic areas.

Visitors have brought an average of two (2) mobile phones with five (5) as maximum number of phones brought to the site, one (1) camera with five (5) as maximum number of cameras brought to the site and (1) drone for the purpose of communication and documentation.

Table 1.5 Profile of the respondents in Adams, Ilocos Norte based on economic considerations.

Economic Considerations		F	%
Employed in	Private	22	21.15
	Government	22	21.15
	Student	50	48.08
	Retired	3	2.88
	Unemployed	7	6.73
	<i>Total</i>		100.00
Category of Employment	Officials of Government/Corporate Manager	1	2.13
	Managing Proprietors and Supervisors	3	6.38
	Professionals	15	31.91
	Technicians and Associated Professionals	5	10.64
	Clerks	3	6.38
	Service, Shops, Market Workers	2	4.26
	Farmer/Forestry/Fisherman	2	4.26
	Traders and related workers	1	2.13
	Plant/Machine Operators	0	0.00
	Laboratory/Unskilled Workers	0	0.00
	Entertainment	0	0.00
	No answer	15	31.91
	<i>Total</i>		100.00
Monthly Income	below 10,000	34	48.57
	10,000 - 30,000	25	35.71
	31,000 - 60,000	9	12.86
	61,0000 - 90,000	2	2.86
	91,000 - 110,000	0	0.00
	110,000 and above	0	0.00
	<i>Total</i>		100.00

Economic considerations are presented in table 1.5. Majority of the respondents were students (48.08%) followed by working class on both private and government organization both 21.15%. Majority of the working class are professionals (31.91%) Majority of the respondents stated that their monthly income is below 10,000PHP (48.57%) while 35.71% of the respondents receives 10,000PHP to 30,000PHP monthly income.

It is also important to note that some respondents shared their monthly expenditures on food, clothing, transportation, health and education. The average monthly expenditure on food is Php5,600; clothing Php2,500; education 3,713 and; transportation Php2,476. Moreover, the average Length of Stay (ALOS) in Ilocos Norte of the domestic and international visitor as well as the local tourist's ALOS in Adams is 2 days and 1 night.

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Table 1.6 Profile of the respondents in Burgos, Ilocos Norte based on economic considerations.

Economic Considerations		f	%
Employed in	Private	20	29.85
	Government	16	23.88
	Student	6	8.96
	Retired	12	17.91
	Unemployed	10	14.93
	No answer	3	4.48
	<i>Total</i>		100.00
Category of Employment	Officials of Government/Corporate Manager	5	9.62
	Managing Proprietors and Supervisors	2	3.85
	Professionals	10	19.23
	Technicians and Associated Professionals	2	3.85
	Clerks	2	3.85
	Service, Shops, Market Workers	3	5.77
	Farmer/Forestry/Fisherman	8	15.38
	Traders and related workers	0	0.00
	Plant/Machine Operators	0	0.00
	Laboratory/Unskilled Workers	20	38.46
	Entertainment	0	0.00
	No answer	0	0.00
	<i>Total</i>		100.00
Monthly Income	below 10,000	22	41.51
	10,000 - 30,000	17	32.08
	31,000 - 60,000	10	18.87
	61,0000 - 90,000	2	3.77
	91,000 - 110,000	0	0.00
	110,000 and above	2	3.77
	<i>Total</i>		100.00

In Burgos, majority of the respondents were employed in private companies (29.85%) followed by government employed (23.88%). Among these working group majority of their occupation falls in the category of laboratory/unskilled workers. Monthly income of the majority of the respondents in Burgos are the same results with that of Adams which are below 10,000PHP (41.51%) followed by 32.08% of the respondents who receives 10,000PHP to 30,000 monthly incomes.

B. Tourist Standards

Inuwayan Wine Shop or also known as Bugnay Farm is one of the first wineries in Adams with a total land area of 700 sq.m. It is open in operation from seven o'clock (7:00) in the morning until five o'clock (5:00) in the afternoon. The Bugnay farm is open for all tourist who wish to visit the plantation area located at the back of the wine shop.

Cardom's Strawberry Farm is a 2 hectares' farm of various fruit and vegetable but this farm is famous in Adams because of Strawberries. It is open for tourists from seven o'clock (7:00) in the morning until five o'clock (5:00) in the afternoon with an entrance fee of Php20.00 per person. Tourists can experience fruit picking and tasting. Aside from Strawberries, Cardom's also plant various Baguio vegetables such as Sayote, Lettuce, Turmeric, different kinds of herbs etc. and seasonal fruits such as dragon fruit, watermelon, rozelle to name a few.

REFMAD Dragon fruit farm is a 20 hectares' dragon fruit plantation located in the town of Burgos, Ilocos Norte. It is the first dragon fruit farm and processing facility in Northern Luzon. It is open from eight o'clock (8:00) in the morning to five o'clock (5:00) in the afternoon. The farm became popular when people learned of its nutritional values and wonders most especially for constipation. Government agencies became more involved seeing the opportunities for more researches and studies

Table 2. Standard requirement of visitors in three farm sites

Space Requirement		Ave
Inuwayan	Per Tourist	2.56 m ²
	Per Group	11.25 m ²
	Number of pax in a group	12 pax
Cardom's	Per Tourist	2.52 m ²

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	Per Group	11.45 m ²
	Number of pax in a group	13pax
REFMAD	Per Tourist	9.72 m ²
	Per Group	38.41 m ²
	Number of pax in a group	6pax
Number of Hours Spent		Ave
Inuwayan	Sightseeing	79 minutes
	Fruit Picking/Harvesting	45 minutes
	Wine Tasting/ Food tourism	45 minutes
	Shopping	40 minutes
	Picture Taking	44 minutes
	<i>Overall</i>	50 minutes
Cardom's	Sightseeing	48 minutes
	Fruit Picking/Harvesting	44 minutes
	Wine Tasting/ Food tourism	49 minutes
	Shopping	48 minutes
	Picture Taking	35 minutes
	<i>Overall</i>	45 minutes
REFMAD	Overall	3.13 hours

As presented in table 2, the space requirement per visitor as FIT in Inuwayan is 2.56 m², in Cardom's is 2.52m² and in REFMAD is 9.72 m². As to group visits, the space requirement per visitor in the group in Inuwayan is 11.25m² for a group of 12 members, in Cardom's is 11.45m² for a group of 13 members and in REFMAD 38.41m² per group of 6 members. The average number of minutes spent in Inuwayan is 50 minutes, in Cardom's 45 minutes and in REFMAD is 3.13 hours.

C. Limiting Factors

Climate

While Ilocos Norte is considered a dry and arid place, according to the town baseline of the municipality of Adams, it differentiates itself from coastal towns as far as weather and climate is concerned. Adams has Type III climate while nearby Ilocos Norte towns have Type I climate.

It is low temperature, closely resembling that of Baguio City, the summer capital of the Philippines; best characterizes the climate of Adams. The wet and dry seasons are present in the municipality with the dry season being pronounced from March to June.

The wet season begins in July and ends in October. The frequency of rainfall is placed to 15 to 21 days per month during the rainy period. From November to February, the temperature of Adams drops to its lowest level. The cool climate has earned for Adams the distinction of the "Little Baguio of the North".

Typhoons often pass through Adams and bring strong gusts of wind and rain. Heavy rain may still fall in Adams, even if the typhoon has gone past the town and moves towards the sea. The mountains funnel the cool northern air with the warm moist air, producing the heavy downpour. The high mountain ranges on the east and west of the town protect Adams from the strongest and most destructive winds. Relative humidity is 78%.

Typhoons

According to Galacgac, Acosta and Alibuyog [8] in their study on Variability of Rainfall and Temperature in Ilocos Norte, it was concluded that annually, the average number of typhoons crossing and affecting Ilocos Norte was 7. However, the average typhoon during period 2 had increased to 9 typhoons as compared to that of Period 1 which was 5. Average data from 1976 to 1990 (standard base period for most climate change studies defined by the World Meteorological Organization) considered Period 1, 1991 – 2010, Period 2, and 1976-2010 were compared. For the year 2011-2017, PAG-ASA recorded an average of five (5) typhoons for the past 7 years.

Tourism Carrying Capacity of Inuwayan (Bugnay) Farm

First level: Basic Carrying Capacity

$$BCC = \frac{\text{Area used by visitors (i.e., in sq.m.)}}{\text{Average visitor's standard (i.e., in sq.m.)}}$$

$$BCC = \frac{700 \text{ sq. m}}{2.56 \text{ sq. m.}}$$

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$$BCC \text{ (individual)} = 273.44 \text{ or } 273 \text{ pax per day}$$

$$BCC = \frac{700 \text{ sq. m}}{11.25 \text{ sq. m.}}$$

$$BCC \text{ (group)} = 62.22 \text{ or } 62 \text{ pax per day per group of 12}$$

Second level: Potential Carrying Capacity

$$PCC = BCC \times RC$$

$$\text{where: } RC = \frac{\text{Total no. of hours a specific area is open for use}}{\text{Average no. of hours an area is used by visitors}}$$

$$RC = \frac{540 \text{ minutes}}{50 \text{ minutes}}$$

$$RC = 10.8$$

$$PCC = 273 \text{ pax} \times 10.8 \text{ rc}$$

$$PCC \text{ (individual)} = 2948.4 \text{ or } 2948 \text{ pax per day}$$

$$PCC = 62 \text{ pax} \times 10.8 \text{ rc}$$

$$PCC \text{ (group)} = 669.6 \text{ or } 670 \text{ pax}$$

Third level: Real Carrying Capacity

$$RCC = PCC \times \frac{100 - lf_1}{100} \times \frac{100 - lf_2}{100} \times \frac{100 - lf_3}{100} \times \frac{100 - lf_n}{100}$$

$$\text{Limiting Factors } (lf_{1,2,3,\dots,n}) = \frac{M_{(a,b,c,\dots,n)}}{MT} \times 100$$

Where: $M_{(a,b,c,\dots,n)}$ = limiting magnitude of the factor/variable

MT = total magnitude of the factor/variable

Lf 1: Excessive sunshine

Six hours per day for 5 months (January to May)

5 months x 30 days = 150 days

M1 = 150 days x 6 hours = 900 hours of excessive sunshine

Mt = 365 days per year x 24 hours = 8,760

$$Lf1 = \frac{900 \text{ hours of excessive sunshine}}{8,760} \times 100$$

$$Lf1 = 10.27$$

Lf 2: Tropical Cyclone

5 typhoons for the past 7 years (2011-2017); 5 days estimated excessive rain and wind

M2 = 25 days x 12 hours = 300 hours

Mt = 365 days per year x 24 hours = 8,760

$$Lf2 = \frac{400 \text{ hours of tropical cyclone}}{8,760} \times 100$$

$$Lf2 = 3.42$$

Lf 3: Climate (Wet Season)

Wet season in Adams from July to October

15 to 21 days a month of rainy season

M3 = 21 days x 4 months x 8 hours = 672 hours

Mt = 365 days per year x 24 hours = 8,760

$$Lf3 = \frac{672 \text{ hours of rain}}{8,760} \times 100$$

$$Lf3 = 7.67$$

Lf 4 : Available CRs

M4 = 1 available CR

Mt = 5 CRs maximum required by visitors

Carrying Capacity of Farm Tourism Sites: Basis for Ilocos Norte's Sustainable Development Plan

$$Lf4 = \frac{1}{5} \times 100$$

$$Lf4 = 20$$

Lf 5: Available benches

M5 = 2 available benches

Mt = 10 benches maximum required by visitors

$$Lf5 = \frac{2}{10} \times 100$$

$$Lf5 = 20$$

Lf 6: Available Picnic area/ hut

M6 = 1 available picnic hut

Mt = 10 picnic area or huts maximum required by visitors

$$Lf6 = \frac{1}{10} \times 100$$

$$Lf6 = 10$$

$$RCC = 2948 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 7.67}{100} \times \frac{100 - 20}{100} \times \frac{100 - 20}{100} \times \frac{100 - 10}{100}$$

$$RCC = 2948 \times 0.8973 \times 0.9658 \times 0.9233 \times 0.8 \times 0.8 \times 0.9$$

$$\underline{RCC (individual) = 1,359 \text{ pax per day}}$$

$$RCC = 670 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 7.67}{100} \times \frac{100 - 20}{100} \times \frac{100 - 20}{100} \times \frac{100 - 10}{100}$$

$$RCC = 670 \times 0.8973 \times 0.9658 \times 0.9233 \times 0.8 \times 0.8 \times 0.9$$

$$\underline{RCC (group) = 309 \text{ pax per day, group of 12}}$$

TOURISM CARRYING CAPACITY OF CARDOM'S (STRAWBERRY) FARM

First level: Basic Carrying Capacity

$$BCC = \frac{\text{Area used by visitors (i. e., in sq. m.)}}{\text{Average visitor's standard (i. e., in sq. m.)}}$$

$$BCC = \frac{20,000 \text{ sq. m.}}{2.52 \text{ sq. m.}}$$

$$BCC (individual) = 7,936.6 \text{ or } 7,937 \text{ pax per day}$$

$$BCC = \frac{20,000 \text{ sq. m.}}{11.45 \text{ sq. m.}}$$

$$BCC (group) = 1,746.7 \text{ or } 1,747 \text{ pax per day per group of 13}$$

Second level: Potential Carrying Capacity

$$PCC = BCC \times RC$$

$$\text{where: } RC = \frac{\text{Total no. of hours a specific area is open for use}}{\text{Average no. of hours an area is used by visitors}}$$

$$RC = \frac{540 \text{ minutes}}{45 \text{ minutes}}$$

$$RC = 12$$

$$PCC = 7,937 \text{ pax} \times 12 \text{ rc}$$

$$PCC (individual) = 95,244 \text{ pax per day}$$

$$PCC = 1,747 \text{ pax} \times 12 \text{ rc}$$

$$PCC (group) = 20,964 \text{ pax per day}$$

Carrying Capacity of Farm Tourism Sites: Basis for Ilocos Norte's Sustainable Development Plan

Third level: Real Carrying Capacity

$$RCC = PCC \times \frac{100 - lf_1}{100} \times \frac{100 - lf_2}{100} \times \frac{100 - lf_3}{100} \times \frac{100 - lf_n}{100}$$
$$\text{Limiting Factors } (lf_{1,2,3,\dots,n}) = \frac{M_{(a,b,c,\dots,n)}}{MT} \times 100$$

where:

$M_{(a,b,c,\dots,n)}$ = limiting magnitude of the factor/variable

MT = total magnitude of the factor/variable

Lf 1: Excessive sunshine

Six hours per day for 5 months (January to May)

5 months x 30 days = 150 days

M1 = 150 days x 6 hours = 900 hours of excessive sunshine

Mt = 365 days per year x 24 hours = 8,760

$$Lf1 = \frac{900 \text{ hours of excessive sunshine}}{8,760} \times 100$$
$$Lf1 = 10.27$$

Lf 2: Tropical Cyclone

5 typhoons for the past 7 years (2011-2017); 5 days estimated excessive rain and wind

M2 = 5 days x 12 hours = 300 hours

Mt = 365 days per year x 24 hours = 8,760

$$Lf2 = \frac{300 \text{ hours of tropical cyclone}}{8,760} \times 100$$
$$Lf2 = 3.42$$

Lf 3: Climate (Wet Season)

Wet season in Adams from July to October

15 to 21 days a month of rainy season

M3 = 21 days x 4 months x 8 hours = 672 hours

Mt = 365 days per year x 24 hours = 8,760

$$Lf3 = \frac{672 \text{ hours of rain}}{8,760} \times 100$$
$$Lf3 = 7.67$$

Lf 4 : Available CRs

M4 = 2 available CR

Mt = 5 CRs maximum required by visitors

$$Lf4 = \frac{2}{5} \times 100$$
$$Lf4 = 40$$

Lf 5: Available benches

M5 = 1 available bench

Mt = 10 benches maximum required by visitors

$$Lf5 = \frac{1}{10} \times 100$$
$$Lf5 = 10$$

Lf 6: Available Picnic area/ hut

M6 = not available picnic hut

Mt = 10 picnic area or huts maximum required by visitors

$$Lf6 = \frac{0}{10} \times 100$$

$$Lf6 = 0$$

$$RCC = 95,244 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 7.67}{100} \times \frac{100 - 40}{100} \times \frac{100 - 10}{100} \times \frac{100 - 0}{100}$$

$$RCC = 95,244 \times 0.8973 \times 0.9568 \times 0.9233 \times 0.6 \times 0.9 \times 1$$

$$RCC \text{ (individual)} = \mathbf{41,148 \text{ pax per day}}$$

$$RCC = 20,964 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 7.67}{100} \times \frac{100 - 40}{100} \times \frac{100 - 10}{100} \times \frac{100 - 0}{100}$$

$$RCC = 20,964 \times 0.8973 \times 0.9658 \times 0.9233 \times 0.6 \times 0.9 \times 1$$

$$RCC \text{ (group)} = \mathbf{9,057.1 \text{ or } 9,057 \text{ pax per day, group of } 13}$$

TOURISM CARRYING CAPACITY OF REFMAD DRAGON FRUIT FARM

First level: Basic Carrying Capacity

$$BCC = \frac{\text{Area used by visitors (i.e., in sq.m.)}}{\text{Average visitor's standard (i.e., in sq.m.)}}$$

$$BCC = \frac{20,000 \text{ sq.m.}}{9.8 \text{ sq.m.}}$$

$$BCC \text{ (individual)} = \mathbf{2,040.816 \text{ or } 2,041 \text{ pax per day}}$$

$$BCC = \frac{20,000 \text{ sq.m.}}{38.41 \text{ sq.m.}}$$

$$BCC \text{ (group)} = \mathbf{520.70 \text{ or } 521 \text{ pax per day per group of } 6}$$

Second level: Potential Carrying Capacity

$$PCC = BCC \times RC$$

$$\text{where: } RC = \frac{\text{Total no. of hours a specific area is open for use}}{\text{Average no. of hours an area is used by visitors}}$$

$$RC = \frac{12 \text{ hours}}{8 \text{ hours}}$$

$$RC = 1.5$$

$$PCC = 2,041 \text{ pax} \times 1.5 \text{ rc}$$

$$PCC \text{ (individual)} = 3,061.5 \approx 3,062 \text{ pax per day}$$

$$PCC = 521 \text{ pax} \times 1.5 \text{ rc}$$

$$PCC \text{ (group)} = 782 \text{ pax per day}$$

Third level: Real Carrying Capacity

$$RCC = PCC \times \frac{100 - lf_1}{100} \times \frac{100 - lf_2}{100} \times \frac{100 - lf_3}{100} \times \frac{100 - lf_n}{100}$$

$$\text{Limiting Factors } (lf_{1,2,3,\dots,n}) = \frac{M_{(a,b,c,\dots,n)}}{MT} \times 100$$

where:

$M_{(a,b,c,\dots,n)}$ = limiting magnitude of the factor/variable

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MT = total magnitude of the factor/variable

Lf 1: Excessive sunshine

Six hours per day for 5 months (January to May)

5 months x 30 days = 150 days

M1 = 150 days x 6 hours = 900 hours of excessive sunshine

Mt = 365 days per year x 24 hours = 8,760

$$Lf1 = \frac{900 \text{ hours of excessive sunshine}}{8,760} \times 100$$
$$Lf1 = 10.27$$

Lf 2: Typhoon

5 typhoons for the past 7 years (2011-2017); 5 days estimated excessive rain and wind

M2 = 25 days x 12 hours = 300 hours

Mt = 365 days per year x 24 hours = 8,760

$$Lf2 = \frac{300 \text{ hours of excessive rain and wind}}{8,760} \times 100$$
$$Lf2 = 3.42$$

Lf 3: Available CR

M3 = 4 CRs are available

Mt = 10 CRs required by visitors

$$Lf3 = \frac{4}{10} \times 100$$
$$Lf3 = 40$$

$$RCC = 95,244 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 40}{100}$$
$$RCC = 3,062 \times 0.8973 \times 0.9658 \times 0.6$$

$$\underline{RCC \text{ (individual)} = 1592 \text{ pax per day}}$$

$$RCC = 782 \times \frac{100 - 10.27}{100} \times \frac{100 - 3.42}{100} \times \frac{100 - 40.00}{100}$$

$$RCC = 782 \times 0.8973 \times 0.9658 \times 0.6$$

$$\underline{RCC \text{ (group)} = 407 \text{ pax per day, group of 6}}$$

From the computation of Carrying Capacity using Boullon's Carrying Capacity Mathematical Model, researchers were able to derive the suggested maximum number of visitors for the farms.

In Adams, the Inuwayan or Bugnay Farm can accommodate a total of 1,359 persons per day on individual visit or as Frequent Independent Traveler (FIT) and 309 persons per day on group visit with 12 members per group. While the strawberry farm can accommodate 41,148 persons per day on individual visit or Frequent Independent Traveler (FIT) and 9,057 visitors per day on group visit.

In Burgos, the REFMAD Dragon Fruit Farm can accommodate a total of 1,592 persons per day on individual visit or as FIT and 407 persons on group visit with 6 members per group.

As of today, according to the farm owners and data on tourist arrivals from the Provincial Tourism Office, the number of people coming into the town or sites has not yet reached the maximum allowed number of visitors.

Carrying Capacity of Farm Tourism Sites: Basis for Ilocos Norte's Sustainable Development Plan

MANAGEMENT STRATEGIES

Since the farms in Adams and Burgos, has not extensively promote their place as tourism destination, here are some management strategies that can be applied to increase the carrying capacity and make the visitors visit more comfortable:

Increase durability of heavily used resources [2]. Benches can be added especially to the farm sites in Adams. Considering the lack of transportation available for transfers in the town, visitors tend to walk from the poblacion going to sites. Comfort Rooms can be improved to the three (3) farm sites that includes also provision of sufficient water supply. From the interviews, one of the problems visitors encountered is the unmaintained CRs not just in site but in the town and province as a whole. Providing benches and maintained comfort rooms can make their visit more comfortable. Other facilities on the site should also be maintained as an added attraction to the tourists [9] [10].

Improve access to other sites of interest. One possible way of doing this is by installing covered walks so that even during hot and rainy seasons, access to an area is not denied and therefore, visitors are not drastically affected. (Calanog, 2015)

Introduce additional recreational activities to distribute visitation or concentration in an area. In Adams, a tour itinerary can be formulated by the municipal tourism office and thus educate the *habal habals* and sites of interest of a unified tour itinerary so that visitors piling up to take their turn for wine tasting or fruit picking will be avoided. To specific farm sites, creative tourism can be introduced to visitors. Creative tourism is a form of tourism where visitors can experience the craft and process of making a local product. In Cardom's where Turmeric is produced and processed as wine or powder, visitors can join in pounding the turmeric using a large mortar and pestle used by the locals. REF MAD Dragon Fruit Farm can also showcase their way of making delicacies and dishes out of Dragon Fruit Scraps to add other activities that is already available in the site.

Providing *Rent-a-Bike* in the town of Adams. Majority of the respondents when asked of the problems encountered is lack of transfers during tours. The Local Government Unit can start this Income Generating Project to solve this problem encountered by the visitors. While it is true that Adams offers adventure tourism through trekking, riding a bike is still considered physical activity and will not alter its image to visitors.

Accreditation as Farm Tourism Sites is highly recommended. Both from the Department of Tourism and some private organization that can make reviews to the farm site. Being accredited gives the farm more competitive advantage, image and branding among other sites in Ilocos Norte.

V. CONCLUSION AND RECOMMENDATION

Majority of the visitors in the farm sites of Ilocos Norte are local tourists which mean visitors are from the Ilocos Region with a mix of young adult and senior citizen age group. Since the different farm tourism sites are located in different municipalities with unique topography, young adults are the market in Adams while the over 65 age group is the market of the Dragon Fruit Farm. The main reason of visit is for Leisure, holiday and Recreation although it is important to note that education as a reason for visit is notable since both sites are good venue for research and studies in different field. Majority of the visitors preferred and undertake sightseeing as their activities in the site, bringing with them an average of one to two mobile phones and one camera for the purpose of communication and documentation. Visitors also requires an average of two comfort rooms to each site and ten benches and picnic areas. Majority of the visitors are working class that are either professionals or unskilled labor with a monthly income of below Php10,000. At an average, visitors stay in the farm from 45 minutes to almost whole day and their average space requirement varies from 2.56m² to 9.79m² for individual travelers and 11.25m² to 38.41m² space requirement for group travels. Limitations in visiting the site includes excessive sunshine, climate, typhoon and availability of facilities in the sites. With the following considerations, the real carrying capacity of each site were determined. Inuwayan/Bugnay Farm can accommodate a maximum of 1,339 persons per day on FIT and 304 persons per day for group travel with 12 members per group. While Cardom's/Strawberry Farm can accommodate a maximum 40,565 visitors per day on FIT and 8,928 visitors per day for group with 13 members per group. Lastly, REF MAD Dragon Fruit Farm can accommodate 1,599 visitors per day on FIT and 408 visitors per day for group with 6 members per group. To increase carrying capacity and arrivals in the sites various management strategies were recommended: 1) Increase the durability of heavily used resources, 2) improve access to other sites of interest, 3) Introduce additional recreational activities, 4) Provide rent-a-bike and 5) Farm accreditation.

In conclusion, as of these days, the maximum number allowed in each site is not yet really reached, however, with this suggested carrying capacity on each site the LGU and owners of farms can come up with a development that will not compromise the environment, economy, and culture.

It is therefore recommended that the farm site should consider the suggested management strategies proposed by the research and for the provincial tourism office to also conduct in identifying the tourism carrying capacity of most visited sites in Ilocos for sustainable tourism and product development.

Carrying Capacity of Farm Tourism Sites: Basis for Ilocos Norte's Sustainable Development Plan

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