

# A Quanti-Quali Approach in Exploring Community Attitudes, Challenges and their Fundamental Components towards Managing Agricultural Resources for Biodiversity Conservation

Edwin M. Puhagan

Office of the Production

Agriculture Department, Tawi-Tawi Reginal Agricultura College

**Abstract:-** This study benchmarked on the community attitudes and contribute knowledge in managing agricultural resources for agrobiodiversity conservation that is very significant to the end-users, farmers, advocates and community development planners. This converse agrobiodiversity emerged from experts on the conservation and use of agricultural resources and contain additional knowledge collected from the scientific experts in the different fields. This study also partly mentions agricultural resources growing across the ZAMBASULTA. Coupled in the parameter is identification of the indigenous domesticated crops and livestock holding a rich diversity of species and varieties and other forms of organisms living in healthy agroecosystem. This was designed to address the most topical issue in the field of agriculture and natural resources today as diverse traditional agricultural systems replaced by high-yielding monocultural practice bringing high-risk to species and varieties of resources consequently affecting biodiversity along agricultural and natural resources ecosystems. In mix method, the researcher combined qualitative and quantitative data to explore the systemic interactions of the variables and authors consulted several experts and resource persons and advocates in local times and places to identify customary principles, practices, attitudes and knowledge towards use and conservation of agricultural resources. About 150 structured mail survey were sent to the respondents across ZamBaSulTa and only 139 returned completely. This study can be interpreted even without knowing the statistical methods used, however, for the consumption of one who is interested to know how the data was analyzed, all statistical analyses in the SPSS software package were used. Finding of the study revealed that introduction of new varieties in agricultural production and over-exploitation of agricultural and forest resources are common causes of declining agrobiodiversity. Human activities threat the forest biodiversity through extensive logging, habitat degradation, kaingin which is difficult to manage sustainably. The increasing demands for food, fuel and income can drive the overexploitation of both agricultural and non-agricultural bioresources. Also inferred community attitudes towards agricultural resources management in the region is most important.

**Practice of modern farming especially the intensive use of chemical fertilizers and pesticides impact the conservation and use of agrobiodiversity. Naturally, increasing demand for food and fuel lead community residents to explore and exploit the diversity of natural resources.**

**The final transcript of this research on benchmarked community attitudes, challenged and their fundamental components in managing agricultural resources for agrobiodiversity recognized and concluded conservation and management sustains agrobiodiversity.**

**Keywords:-** *Agrobiodiversity, Agricultural resources, benchmark community attitudes, conservation and management.*

## I. INTRODUCTION

Countries anywhere in the world today extremely need food for survival, innovate agricultural production systems for consumption and exchange to boost economy and this are all bound for agriculture. Agriculture and livestock production in some regions dominate gross domestic product and employment base while others depend on import products. Others have increased their exports of agricultural crops over decades while maintaining a biodiverse natural resources-base with large areas under legal protection. Yet, there are other regions still struggling food insecurity, drought and calamities, political instability which cause slowing economy and unstable foreign investment. This all depends on leadership will and community attitudes towards agricultural resources conservation, protection, preservation and management.

For this purpose, countries may have introduced a Green Revolution program and concepts of directing agriculture away from agrobiodiverse farming system to monocultures farming with intensive external inputs. Nevertheless, productivity is seen to increase and yet there is still impact of high risk for small and large-scale farming due to its land degradation, vulnerability to crop varieties, pests and other organisms' species. Example, too much external inputs to farmland like application of commercialized fertilizers bringing toxic which severely

contaminate and diminish soil fertility. Countries are contesting in the corporate rat race for global economy wherein economies in the rural level are unfastened by the rules and regulations to achieve influence of global market system by means of transmitting international prices into local communities focusing on export crops bringing new opportunities to maximize profit from commercial crop production leaving local farmers hesitant to continue producing basic food crops for domestic consumption. Population growth and lack of political will in conservation and management of agricultural natural resources and failure to acknowledge environmental values might weaken agrobiodiversity that can be seen in an increasing reliance on natural resources to meet macroeconomic goals and foreign need.

In this case, the authors have undertaken in doing this research through survey method in exploring attitudes of the community residents, farmland owners and farmers among others. It unfolds traditional components and consolidate existing best practices in managing agricultural resources for biodiversity conservation base on the height of subjectivity enclosed in quantitative and qualitative perspectives. It also confined information and interpretation of the transcript interviews of the local residents, stakeholders and advocates in the region in 2016-2019.

#### A. Significance of the study

This study benchmarked on the community attitudes to contribute knowledge in managing agricultural resources for agrobiodiversity conservation significant to the end-users, farmers, advocates and community development planners. It adapts guide structure for looking at agrobiodiversity emerged from experts of agricultural production systems and community development systems on the conservation and use of agricultural resources, biodiversity, key aspects of deteriorating biodiversity, ecosystems and landscape level issues and provide measures to conserve agrobiodiversity in the region. It contains additional knowledge collected from the scientific experts in the different fields such as soil biodiversity, biodiversity that mitigates pests and diseases, crops, soil sciences and genetics resources, and wild biodiversity in agricultural landscapes. This study also includes determining the agricultural resources growing across the region ZAMBASULTA. Coupled in the parameter is identification of the indigenous domesticated crops and livestock holding a rich diversity of species and varieties and other forms of organisms living in healthy agroecosystem, yet, many is in the stage of disappearing due to introduction of the infrastructural development across the territory although a little has been done to catalogue, conserve and promote them. This study may serve significance to the advocates who wish to conduct similar study in the near future. The information and lessons that can be derived from this study compiled in TRAC Development Guide and Tawi-Tawi Agricultural Resources Management Conservation Guide aiding the provincial biodiversity conservation planners and other agencies to formulate strategies and action plans for conserving agrobiodiversity.

#### B. Issues on Agroecosystems

The most topical issue of agriculture and natural resources today is the disastrous consequences as diverse traditional agricultural systems are being replaced by high-yielding monocultural farming practice bringing high-risk species and varieties of resources which consequently affect wildlife species along agricultural and natural resources and gradually breaking agrobiodiversity ecosystems. With the purpose of preventing this issue, this study examined community attitudes towards agricultural resources, status of agrobiodiversity and proposed feedback for conservation, management and use of agricultural resources that transversely connect to the existing national biodiversity strategy and action plans as conceived in the region.

#### C. Objectives

Based in principles of traditional attitudes and knowledge, this study spotted four important areas in understanding conservation and management of agricultural resources that encompassing 1) nature and impact of agricultural production system, 2) determinants of declining biodiversity and 3) determined challenges in conserving and managing wild biodiversity in agricultural areas and, 4) approaches and strategies for diversification of agricultural landscape farming. It was guided with the following specific objectives:

- In qualitative perspective, this captures range of advocates, stakeholders or respondents' point of view about the issues on the conservation and use of agricultural resources.
- Benchmark community attitudes towards agricultural resources management.
- Provide baseline information of nature and impact of agricultural production system adopted by the end-users as requirement attach to agriculture and community development planning.
- Examine knowledge on the diversity of agricultural resources.
- Gain better understanding on the key aspects of deteriorating biodiversity.
- Examine approaches in conservation and management of biodiversity in agricultural areas.
- Discover rules and regulations as implementing guidelines for agricultural development through agrobiodiversity management in the region.
- Find out challenges towards conservation of diversity of agricultural resources.
- Determine the relationship among socioeconomic, farm size and farming as an occupation of the respondents.

#### D. Scope and delimitations

This research was delimited few variables as indicators of attitudes and knowledge in conserving and managing agricultural resources for diversification. There was no single instrument able to collect data on all possible variables, however, 95% of the instrument retrieved from the respondents, and therefore, some variables were not conferred in the results of the study and from here experts were tasked to critic and determine the variables included in the analysis of the survey. A mail

survey highlighted the respondents' attitudes towards agricultural resources and the important issues and trends of agricultural production system including other important indicators. This procedure was done to collect information across huge number of respondents at minimal cost that would be possible in face-to-face interviews limiting the researcher to conduct follow-up questions in exploring responses of the respondents for supplementary detail. This study allowed the researcher to compare responses across wide range of respondents on the bases of its option list than requiring open-ended answers. However, qualitative transcription and interpretation was employed to augment comprehension of the results. This was conducted in long-term duration from 2016-2019 and to greatly identify the possible trends over years this research should be followed by another hypothetical survey. A face-to-face interview was conducted only by-chance to those respondents accessible to the researcher who then have not receive a mailed survey questionnaire, and the interpretation of the transcript was secured in confidential status before the finalization of this article. There were 120 identified reliable respondents participated in this study.

#### E. Definition of terms

Operational definition of the terms was used to provide full understanding of the research problem.

- **Agricultural Resources Management** – the process or an act of managing all the natural and manmade resources of agricultural production including the land, soil, water, air plant communities, watersheds, natural and physical attributes that together comprise and support agriculture.
- **Agricultural Production Systems and Practices** – comprised of multidimensional components that interact in complex ways to maintain an economically feasible production for farmers or influence agricultural production sustainability which is profitable, preserve the natural resources productivity and quality and sustains vibrant communities.
- **Agrobiodiversity** – means Agricultural Biodiversity. Resulted from the interaction between the environment, genetic resources and management systems and practices used by culturally diverse peoples. The variety and variability of living plants and animals and sounding micro-organisms in their genetic species that sustain the structures, functions and processes of the ecosystems that provide either non-food or food agricultural products created and managed by farmers, fishers and forest dwellers attributed to food and livelihood security and livelihood strategies of rural communities throughout the world.
- **Biodiversification** – refers to a risk management strategy that mixes a wide variety of species including **diversity within species**, between species proliferated within an area or a group of organisms settled in the ecosystems. It is the process of putting all together the variability among living organisms from all sources starting from terrestrial down to marine and other aquatic **ecosystems** (vis-à-vis) including its ecological complexity of which they are belonging.

- **Community Attitudes** – this consists of indigenous perceptions towards diversity of agricultural resources which varied base on factors such as dependency level of the forest and natural resources and ethnicity.
- **Conservation Agriculture (CA)** – this study defines conservation agriculture is an approach to managing agro-ecosystems. It a way to combined profitable agricultural production with environmental concerns and sustainability. It holds tremendous potentials for all sizes of farms and agro-ecological systems to improve, increase and sustain profit and food security by preserving and enhancing agricultural resources.
- **Diversity** – the composition of different elements, classes, types, species living in symmetrical environment or community.
- **ZamBaSulTa** – the composite of four major provinces such as Zamboanga, Basilan, Sulu and Tawi-Tawi.

## II. REVIEW OF RELATED LITERATURE

Feeding millions of teeming population may result to a converting of natural resources into agricultural resources for production. However, one must be aware of the impact of conversion of the resources to biodiversity. In the Philippines, there are rules and regulations serving as guidelines for the community developers who intend to convert forest land and natural resources into agricultural farming systems. To mention few like the Philippines NBAAP 1997 notes some indigenous communities possess biological resources, sacred and source of cultural identity. This type of value is attached to natural resources contributes its preservation and sustainable use. Conservation of agricultural native varieties necessitate regulations for its preservation, protection and sustainability. Mentioned in SECI, the farm genetic resources have been conserved over millennia through social systems that reinforced conservation because it was useful to this effect. The maintenance of diversity on local varieties or breeds depends both on natural selection and on farmer management.

To address the scarcity of food in the galleries, the government and advocates or supporters have introduced the improves agricultural systems that have the potential to improve the environment and to be the overseer of life-threatening aspects of farm genetic diversity needed for future agricultural improvement programs in the world and to host vast populations of wild biodiversity. The new agricultural systems bringing agricultural inputs which gradually change the methodology in farming. In developing countries, these inputs are imported and strain the importing country's balance of payments and these inputs are used primarily on export crops without the assurance of improving food security. For this purpose, there are certainly international and regional supporters and NGOs doing acts focusing on providing guidance on these trending issues at community levels. For one to gain access to many of these can be seen at.

Conservation and Management of Agricultural Resources is deemed to be more importantly ascertain in the Philippines Setting coupled with the existing policies, rules and regulation attached thereat for conserving biodiversity of the natural and agricultural resources. An excellent series of publications on agrobiodiversity conservation are available at this web site, including a useful discussion of incentive measures, in the publication by Evy Thies (2000). To mention few, The Philippines Republic Act 7308, or the Seed Industry Development Act of 1992, is policy meant to promote and accelerate the development of the seed industry, particularly to conserve, preserve, and develop the plant genetic resources of the nation. The Philippines Republic Act 7900, or the High-Value Crops Development Act of 1995, promotes production, processing, marketing, and distribution of high-valued crops for export to augment the foreign exchange earnings of the country. Philippines Local Government Units (LGU), under existing Local Government Code Republic Act 7160, are given authority to exercise their power in managing the country's resources. Philippines Memorandum Order No. 289 (1995) directs the integration of the Philippines' strategy for biological diversity conservation in the sectoral plans, programmes and projects of the national government agencies and the operationalization of the objectives of sustainable biological diversity resource management and development as embodied in the strategy. The Philippines Investment Priorities Plan (IPP) (Executive Order 226) of 1992 at present includes both agricultural and non-agricultural based industries. The Commonwealth Agriculture Bureau International (CABI) Bioscience IPM for Highland Vegetables project was set up in 1994 and is funded by the Asian Development Bank. Insecticide resistance and human health problems had become so severe that the IPM project set up FFSs to increase awareness about the harmful effects of pesticides, increase knowledge of natural enemies, and encourage discussion on best husbandry practice among farmers.

Issues relevant to Agrobiodiversity can be seen at this link <http://www.communityipm.org/downloads.html>. Agrobiodiversity can be used to reestablish natural balances in farming systems with healthier environments, a more rational use of resources, and a greater dependence on internal rather than purchased controls. Here are key principles for the conservation of agricultural ecosystem services are: It is imperatively vital to policymakers, landowners, farm owners, farmers among other to understand the concept that agricultural ecosystem services can sustain themselves with good development proposal. Also, important to note that bionetwork services have the potential to reduce site inputs and pollution. Identify, classify and catalogue the bioresources. Assessment of risks over time, relative dependence, and sustainable livelihoods are critical issues for agricultural biodiversity and its stability. Policy makers are biased toward large scale plans, whereas much of agrobiodiversity is fine-scaled. Costs and benefits of agrobiodiversity goods and services need to be identified. Costs and benefits need to be distributed on the basis of careful assessment of possible

trade-offs, paying attention to incentives and subsidies, and making them appropriate. Creating popular awareness and education is necessary for change and It is necessary to enhance capacity for adaptation to change. Many experts say not only do agricultural systems impact heavily on the conservation of wild biodiversity, but it has been shown in multiple ways that farming landscapes host a large share of the planet's biodiversity, and much that is extremely critical to human livelihoods, Barbara Gemmill retrieved 2019.

The availability of locally adapted crop varieties to particular micro niches may be one of the few resources available to resource-poor farmers to maintain or increase production on his or her field (Jarvis et al. 2000). A large number of on-line publications and newsletters in relation to crop genetic resources can be found at the IPGRI publication with this link at <http://www.ipgri.org/publications/publist.asp>.

Agrobiodiversity in the Philippines has been heavily affected by importation of exotic species and varieties and by release for commercial planting of genetically altered varieties approved by the Philippines National Seed Industry Council (NSIC). From 1955 to 1975 the NSIC focused on rice and corn, but later expanded to field legumes, root crops, tobacco, sorghum, wheat, cotton, and vegetables. In 1991 it began releasing registered fruit varieties. Threats to livestock diversity come from inappropriate breeding, importation of exotic breeds, reduction in grazing area, lack of conservation, lack of awareness of animal genetic resources conservation, and lack of policy (Philippines 1995a). Human-induced threats to forest biodiversity come mainly from extensive logging, habitat degradation, kaingin (slash-and-burn agriculture), and pests and diseases (Philippines 1995b). There is also increasing trade with neighboring countries in human and animal food, medicinal plants, and raw materials for handicrafts and industry (Vietnam 1995), which is difficult to manage sustainably.

Abbi cited by Pamela Cunneyworth in 2011. Agrobiodiverse ecosystems have steadily declined in the region as the concepts of the Green Revolution have created a profound effect on directing agriculture away from agrobiodiverse farming systems to monocultures with external inputs. Constraints to the greater integration of agrobiodiversity into agroecosystems include lack of adequate national agriculture policies and lack of inclusion of necessary planning in National Biodiversity Strategy and Action Plans; lack of planning at the landscape level and the related constraint of lack of cross sectoral linkages within government.

Hannah Nadel 2011 mentioned, although indigenous domesticated crops and livestock hold a rich diversity of species and varieties, and other organisms around them hold the key to healthy agroecosystems, little has been done to catalogue, conserve, and promote them. Indeed, many are in the process of disappearing, especially in the Developing World, as biodiverse traditional agricultural systems are replaced by monocultures of high-yielding,



high-risk exotic species and varieties, often with disastrous consequences. Conversion of forest to agriculture is a major cause of biodiversity loss throughout the region. Modern cultivation has threatened the age-old bonds between local farmers and traditional crops.

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In some regions like in the western continents and other Europeans spearhead **Agricultural Conservation Easements**. Describes the process of implementing agricultural easements and the benefits of preserved farmland on the environment. Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. **Agricultural Protection Zoning**. Preserves the availability of agricultural lands for farming and thus the agricultural base of the community by constraining non-agricultural development and land uses in designated areas. Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. **Economic Benefits of Land Conservation**: A Guide to the conservation of natural lands and of working farms and forests can generate financial returns, both to governments and individuals, and create significant cost savings. Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. 119 Pine Street, 1st floor, Harrisburg, PA 17101, 717.230.8560 info@conserveland.org. retrieved 2019. [1,2,7].

### III. METHODOLOGY

In mix method, the researcher combined both qualitative and quantitative data to explore the systemic interactions of the variables. The following methodology includes a summary of the gathered literature the authors drew upon to identify the variables necessary in the survey. It used a mailed survey instrument method containing major topics for discussions. A brief description of the mail out process and the approach to data analysis is also included such as assessment of issues, feedbacks on socioeconomic, attitudes towards agricultural resources, knowledge on the nature and impact of agricultural production system adopted by the end-users, farm size and farming as an occupation, land use and knowledge on the agricultural production system, knowledge on the key aspect of deteriorating agrobiodiversity and assurance on the use of recommended agricultural production practices, .

#### ➤ *Setting of the study*

**ZamBaSulTa** is a representation of four provinces such as Zamboanga, Basilan, Sulu, and Tawi-Tawi. These four separated provinces are volcanic origin and irregular in shape at the southwestern part of the Philippines bordering Sabah Malaysia and Indonesia. Main land of each province is hilly and heavily wooded serving as comfort zone for the wildlife species, with splashes of white sandy beaches and rock-bound coast for marine life.

#### ➤ *Procedure:*

To establish reliability and validity of the research, the author consulted several experts and resource persons, residents and advocates in local times and places to identify customary principles, practices, attitudes and knowledge towards use and conservation of agricultural resources and tools of collective and shared benefits to sustainable agriculture and agrobiodiversity conservation planning. About 120 structured mail survey sent to the respondents across ZamBaSulTa territory and only 115 returned completely by mail.

#### ➤ *Method of analysis*

This study can be interpreted even without knowing the statistical methods used, however, for the consumption of one who is interested to know how the data was analyzed, all statistical analyses in the SPSS software package were used. Analyses consists of descriptive statistics, correlations used to identify hypothesized relationships between variables or to determine the extent of the relationship between ranks on the two variables, chi-square test, regression, t-Test and more.

#### IV. RESULT AND DISCUSSION

The result of this study interprets and explains the data relative to the phenomena coupled with the literature reads and citations to gain comprehension on the topical issues and problems such as **Exploring Community Attributes and their Fundamental Components towards Agricultural Resources Management for Biodiversity Conservation.**

**Answer to the objective number 1 stated:** to capture the range of advocates, stakeholders or respondents' point of view about the issues on the conservation and use of agricultural resources.

This portion was transcribed from the qualitative point of view following claims of the respondents. Accordingly, the tandem of natural resources, agricultural resources and commodities is the teeming human population in the region couple with its level of consumption leading to a demand of improving agricultural production system in an attempt to increase food supplies in the galleries and alleviate poverty. To them, agricultural production system has to be developed within these decades so as to address the expected consumption commodity demands of the human population. Agricultural paradigm shift introduced and perhaps applied as farming system however, planners along agricultural production systems must assure the impact of these systems on the conservation and use of biodiversity. The improper application of new technology, non-conservation techniques and misuse of natural and agricultural resources imminently endanger the nature of our biodiversity. Like for instance, conversion of wild land to agriculture, conversion of diverse small-scale farming to homogeneous large-scale commercial farming systems, increased cultivation of unusual cash crops and the utilization of modified species and varieties that often require high inputs such as fertilizers, insecticides and other growth enhancer chemicals, overexploitation of wild biodiversity resources. These all leads to reducing the density of biodiversity with long term reclamation consequences. Another is the conversion of forests into form of community infrastructural development causing loss of biodiversity through the zone.

Many of them shows awareness on the issue of new trend in marketing like market export that produce much incentives and promote commercialization forests products and agricultural resources are heavily favored today but already a threat to small-scale biodiverse farming must be given a leading policy protection and enhancement. To them, this trend dispenses amount for biologically diverse production system like floriculture, olericulture, pomological growing plants and other forms of incentive farming. In addition, the advent of commercialized chemical fertilizers in modern farming practices shall have

greater impact to the conservation and use of biodiversity that might displace traditionally produced crabs and other species that used to supplement local diets in many parts of the region. More, one who is engage in any community-agricultural development planning should be aware of the issue of pesticides and other toxic chemicals about their effect on dwindling wildlife. Be it known that elimination of natural resources or wild plants bordering the crops especially plants in nearby farm that provide variety of services to agriculture like self-regulating pest control and genes from wild relative crops also reduce diversity. Accordingly, introduction of new varieties in agricultural production and over-exploitation of agricultural and forest resources are also common causes of declining agrobiodiversity. Moreover, human can also be threat to the forest biodiversity through extensive logging, habitat degradation, kaingin (slash-and-burn agriculture) and pests and diseases which is difficult to manage sustainably. The increasing demands for food, fuel and income can drive the overexploitation of both agricultural and non-agricultural bioresources by means of hunting, fishing, wood cutting, logging, harvesting of wild wooded trees for handicraft and industrial purposes.

**Answer to the objective number 2 stated:** to benchmark and evaluate community attitudes towards agricultural resources management.

Table 1 below presents quantification of benchmarked community attitudes of the respondents towards agricultural resources management where all of them responded most importantly on self-assurance where cooperation among aboriginal communities and landholders could protect the cultural heritage sites, private property and diversity of the resources. A well emphasized agricultural production systems by the experts/authorities among private farm owners and the farmers themselves should be enhanced. It is believed that diverting of diversified farming to industrialized farming deteriorates wildlife and exploit natural agricultural resources. Accordingly, government subsidies and grants should be made available to the farm holders and farmers to remedy problems in the operation. Clearing of native vegetation has substantially reduced the abundance and existence of native plants and animals in the region. Benefits of community development program introduced in the locality have caused exploitation of the agricultural resources. All landholders/farm owners should be well informed of the impact of agro-biodiversification, and better knowledge and information about the agrobiodiversity conservation and management. Based on the value of the weighted average (2.60 out of 4.00 maximum value that can be obtained), which fall for decision value of most important, it can be inferred as revealed above that community attitudes towards agricultural resources management in the region is most important.

BENCHMARK ATTITUDES	Mean	Std.	Remark
1. I assured that cooperation among aboriginal communities and landholders could protect the cultural heritage sites, private property and diversity of the resources.	2.46	1.01	Most important
2. Agricultural production systems should be well emphasized by the experts/authorities among private farm owners and the farmers themselves.	2.49	1.00	Most important
3. Diverting diversified farming to industrialized farming deteriorates wildlife and exploit natural agricultural resources.	3.10	0.93	Most important
4. Farmers and tenancy should be equipped with managing strategies and paid for environmental services that benefit the wider community.	2.09	2.03	important
5. Government subsidies and grants should be made available to the farm holders and farmers.	3.01	0.15	Most important
6. I believe clearing of native vegetation has substantially reduced the abundancy and existence of native plants and animals in the region.	3.15	0.18	Most important
7. I believe that the benefits of community development program introduced in the locality have caused exploitation of the agricultural resources.	2.50	2.11	Most important
8. It is difficult to get access advice or assistance from the government in the region in terms of agricultural resources management.	2.08	2.16	important
9. Landholders/farm owners should be well informed of the impact of agrobiodiversification.	3.12	0.18	Most important
10. We need better knowledge and information about the agrobiodiversity conservation and management	2.00	2.12	important
<b>TOTAL</b>	<b>2.60</b>	<b>0.97</b>	<b>Most Important</b>

Table 1:- Attitudes towards Agricultural Resources

Legend:

3 = Most important

2 = Important

1 = Less important

Decision Value:

0.00-1.94 = Less important

1.50-2.44 = Almost important

2.45-4.0 = Most important

**Answer to the objective number 3 stated:** Provide baseline information of nature and impact of agricultural production system adopted by the end-users as requirement attach to agriculture and community development planning.

Applying the qualitative principles, this portion presents brief interpretation of transcript where there are numbers of agricultural production systems introduced within the past decades that accordingly increase food supplies in the galleries and undeniably alleviate poverty. The intensification of the agricultural production systems attained by sacrificing components of natural resources like conversion of wild land into industrialized agriculture, exploitation of biodiversity resources, shifting of diverse small-scale farming into homogeneous large-scale commercial farming coupled with the successive utilization of modified species, varieties that requires high inputs of

chemical fertilizers and rigid application of pesticides, and increased cultivation of exotic cash crops for rigorous incentive benefits.

Accordingly, cash-cropping is a principle in modern cultivation that is a threat to small-scale biodiverse farms where its market economy switches local farmers to use new varieties and species gambling on cash crop in demand which may have danger to traditional varieties and species adapted to soils and climatic condition of the region. Some farmers and farm owners mention that the practice of modern farming especially the intensive use of chemical fertilizers and pesticides impact the conservation and use of agrobiodiversity. Introduction of new varieties in agricultural production and exploitation of the nearby farm natural resources may cause decline in agrobiodiversity resources. Also, kaingin plots in forest are abandoned after

use in one or two years of cash-crop production and remain unproductive for many years. Another is the increasing demand for food and fuel leading community residents to explore and exploit the diversity of natural resources such as cutting of woods for timbers, handicrafts, industrial purposes, decorative trades, etc.

**Answer to the objective number 4 stated:** examine knowledge on the diversity of agricultural resources.

With regards to the knowledge of the respondents on the diversity of agricultural resources, huge number of them mentioned approach to conservation and management of agricultural resources, agricultural production system, opportunity and practice for change, vegetation of annual, biennial and perennial plants to prevent water tables rising and soil erosion, benefits of ground cover on grazing or cropping paddocks, and conservation value and concept towards diversity of agricultural resources. Further, it was in their innate claims to have thorough knowledge and give values on the diversity of wildlife species within agricultural ecosystems, diversity that mitigates pests and diseases in agricultural land, impact of woody debris in rivers/streams and terrestrial area to community health, land and soil management: how to interpret results from soil testing and how to recognize signs of salinity, local vegetation as sources of agricultural natural resources with high conservation value, the key aspects of declining

agrobiodiversity like indigenous crops and livestock varieties, and the trend and influence of agricultural production system. Meanwhile, they have little knowledge on the land where diversity of natural and agricultural resources is existing. In addition, they need to be informed and equipped of the genetic resources, high-value crops and market production system, and rights of indigenous people to practices, protect and preserve agricultural resources in their own locality. Now,

Based on the value of the weighted average (2.39 out of 4.00 maximum value that can be obtained), which fall for decision value of “some knowledge”, it can be inferred as revealed above that the knowledge of the community residents or the land owners or farm owners need to be enhanced with more emphasis on diversity of agricultural resources of the region needs since they doesn't have thorough knowledge about the phenomena. Conversely, landowners having knowledge about diversity of agricultural resources would lead himself merge into a universal principle of conservation and management along way of protecting and preserving local species and other forms of wildlife organisms within agricultural landscapes. It is paramount that agricultural resources are complemented with conservation and management, good practices and attitudes of the residents for sustainable agricultural production intensification and survival.

KNOWLEDGE ABOUT DIVERSITY OF AGRICULTURAL RESOURCES	Mean	Std.	Remark
1. Approach to conservation and management of agricultural resources.	3.12	0.197	knowledgeable
2. Agricultural production system, as an opportunity and practice for change.	3.10	0.253	knowledgeable
3. Annual, biennial and perennial vegetation to prevent water tables rising and soil erosion.	3.05	0.302	knowledgeable
4. Areas in the region where plants are suitable for vegetation.	2.03	1.021	with knowledge
5. Assistance available for drought and/or exceptional circumstances that may affect agricultural resources	1.45	1.914	with knowledge
6. benefits of ground cover on grazing or cropping paddocks to maintain or improve soil health (conditions and fertility)	3.18	0.112	knowledgeable
7. Conservation value and personal concept towards diversity of agricultural resources.	2.75	1.025	knowledgeable
8. Direction where to go for advice about government programs that support landholders to better manage agricultural resources.	2.22	1.982	with knowledge
9. Diversity of wildlife species within agricultural ecosystems.	2.47	0.895	knowledgeable
10. Diversity that mitigates pests and diseases in agricultural land	2.49	0.951	knowledgeable
11. Effects of unrestricted stock access on waterways and native vegetation.	2.25	2.101	with knowledge
12. Genetic Resources, High-Value crops and Market production system, and Rights of indigenous people.	1.99	2.917	with knowledge
13. Identification of types and structures of soil in this farmland.	2.43	1.056	with knowledge
14. Impact of woody debris in rivers/streams and terrestrial area to community health.	2.57	1.958	knowledgeable
15. Information about value of woody debris in ground water ecosystem.	2.39	2.154	with knowledge
16. Land and soil management: how to interpret results from soil testing and how to recognize signs of salinity.	3.00	0.231	knowledgeable
17. Land where diversity of natural and agricultural resources is existing			



		1.13	2.991	with knowledge
18.	Local and native vegetation as sources of agricultural natural resources with high conservation value.	2.80	0.421	knowledgeable
19.	Policies regulations and implementations of agricultural development plans on agrobiodiversity management.	1.99	0.215	no knowledge
20.	remedy farm problems in native vegetation cover in the region over farming period.	2.13	2.012	with knowledge
21.	The benefits of grassland pastures and crop rotation in maintaining soil health and productivity.	2.44	2.268	with knowledge
22.	The key aspects of declining agrobiodiversity like indigenous crops and livestock varieties.	2.46	1.251	knowledgeable
23.	Trend and influence of Agricultural Production System.	3.20	0.175	knowledgeable
<b>TOTAL</b>		<b>2.39</b>	<b>1.183</b>	<b>with knowledge</b>

Table 2:- Knowledge about Diversity of Agricultural Resources

Legend:

3 = knowledgeable

2 = with knowledge

1 = Not at all

Decision Value:

0.00-1.94 = not at all

1.50-2.44 = with knowledge

2.45-4.00 = knowledgeable

**Answer to the objective number 5 stated:** Gain better understanding on the key aspects of deteriorating agrobiodiversity.

Qualitative method had helped interpreted the data transcribed from the respondents with brief discussions evolve in five (5) indicators of declining diversity pieces of agricultural resources such as a.) **indigenous crops and livestock varieties** persuaded by the interest of local farmers in converting their small-scale farms into cooperative industrialize farming bringing about utilization of exotic high-yielding crops, poultry and livestock varieties that displacing other non-described varieties in the locality of diverse traditional food crops as replaced by monoculture exotic cash crops. Traditional home gardens are major sources of household requirements for survival where various crops like staple food crops, non-staple food crops for timber and other house construction materials, biomass energy, feedstuff and silage, organic manure for the fields, medicinal plants, edible oils, spices and others that might be considerably declining in the future. b.) **wild species within agricultural ecosystem** could be threatened by the advent of commercial agriculture system and radiation containing satellites cables and stations that drive away fruit-bats and other small species animals with direct influence on agriculture. The decline in number of these species could reduce the pollination and yield of some traditional fruits where many plants depend on. Yet, advocates, innovators, farmers, landowners among others should not defunct the population of these species in the region but rather protect and conserve them. c.) **deteriorating land level diversity** is affected by the act of clearing the cover forest or old-growth forest in the area for timber and for commercial agriculture. Conversely,

establishment of housing projects and more other development like recreational sites and other infra-related establishments could bring harmful effect to biodiversity ecosystem of the region. d.) **Misconception of Agrobiodiversity** in broader sense, weak interpretation of status and trends of agrobiodiversity leads to a narrow comprehension about conservation permeating the region.

The Philippine Sectoral Report on Agriculture and Livestock (1995) retrieved 2019, defined agrobiodiversity that include only crops and livestock species and their wild relatives, rather than also the broader ecosystems or landscapes in which these exist. Agrobiodiversity is merely defined as the plant and animal resources for development. The latter might have only been interpreted as the aspect of biodiversity selected, modified and adapted by the numerous generations of people to serve their growing and changing needs for survival. Interpreting agrobiodiversity must encompass biological diversity of agriculture related species and their wild relatives existing within cultivated areas that provide services to agriculture such as soil organisms that prevent soil erosion and convert foreign materials into soil nutrients and contribute fertility, pollinators and species that provide habitat for beneficial organisms, etc. e.) **opportunities and practices for change** would influence attitudes to uncover sustainability of biodiversity triggered by misconception and disrespect for indigenous knowledge on traditional ecosystems, promotion and use of new technologies rather than mechanization of local agricultural practices, forcing rural areas into global economy, tapping good numbers of traditional farmers remaining only weak farmers.

**Answer to the objective number 6 stated:** examine approaches to the conservation and management of biodiversity in agricultural areas.

In response to this, the author explored various approaches in conservation and management of agrobiodiversity and able to determine few of the many appropriate approaches more necessary to be infused in the regional agricultural plans provision, strategies and action plans in conserving and managing agrobiodiversity. The following are listed below such as:

➤ *Traditional knowledge of agrobiodiversity*

- community outreach on agroecosystem helping local farmers discover indigenous varieties of crops in itinerant biodiversity festivals to discuss with them its importance and formulate strategic action plans for conservation and enhancement of agrobiodiversity for each village.
- innovative pilot that could be of greater help to effect establishment of young farmers associations like the Future Farmers of the Philippines FFA in the community and high school level and Future Farmers of the Philippines Collegiate Chapter in the Tertiary level of agricultural institutions.
- program endeavors respect and protect the knowledge of the villagers relating to biodiversity by inoffensively registering or recording such knowledge at the school records, local and national levels and other indigenous protection means.
- emphasis on the recognition of the role of villagers and community in managing their bounteous natural resources where they boast sources of cultural identity attach to resources contributing preservation and sustainability.
- Huge number of communities occupying forest areas that accommodate variety of plant and animal species, preserve and protect their cultural and spiritual values attach to natural resources.

➤ *Diversity in Land*

- community developers must not limit their knowledge in understanding the definition of agrobiodiversity especially when in bringing development to the community, there should be wider coverage in determining its impacts to domesticated plant diversity.
- maintaining wide variety of food crops for consumption and for food market supply like cassava crop, cereals and additional locally grown vegetables with preferred taste and high nutrition value, very tolerant to its soil and climatic condition of the region.
- These areas possessing rich diversity of crops and wildlife species where local farmers landscaped and protect its landraces and their wild relatives as resources.
- Abundant effective planting, selection and conservation of locally grown introduced varieties, using intercropping, crop mixtures, and rotations like small trees in farms and forest resources for food-related purposes as practice in traditional farming.

- Local farmers develop new varieties and crops in response to changes or stress in the environment, threats of disease, and changing socioeconomic conditions.

➤ *Soil Diversity*

- Maintaining and managing a permanent soil cover through farm planning and crop rotation strategy, choice of most suitable cover crops in multiple purpose, maintaining crop covers and uses of its residues.
- Minimum soil disturbance or know as non-tillage and direct planting except those plants need transplanting (and option for the farmers to do so).
- Pest, seed and fertility management which imply chemical and labor inputs, the use of synthetic pesticides, herbicides and mineral fertilizers tend to contaminate and decline soil diversity.

➤ *Diversity that mitigates pests and diseases*

- Applying the principles behind the integrated pest management (IPM) capacitates farmers to manage farming ecosystem.
- Training and demonstrating the concept and practices of (IPM) to address wide soil infertility and water nutrient contamination management issues.
- enhanced by row planting, planting distance, biofertilizers (organic), adoption of biocontrol agents to lessen pest and diseases occurrences.
- Applying the principles of polyculture methods have several benefits like mitigation of crop pests and diseases.

➤ *Crops, Soil and genetic resources*

- Protects and preserves endangered species of staple crops in agroecosystems using technologies in seed storage, tissue culture and living collection of locally grown native plants across the country.
- Establish repository of several important vegetable varieties that may suit across soil and climatic conditions of the Philippines.
- Develop and conserve varieties of high-yielding fruits, vegetables, grains and ornamentals relative to plant improvement.
- Philippines must enhance promotion of botanical gardens and provide services for plant genetic resources conservation including training, education information dissemination, technical consultancy and resource mobilization.

➤ *Biodiversity in agroecosystem*

- This emphasizes establishment of conservation centers for wild relative domesticated species and varieties, wild species that can be found both in wild borders or in field around crop lands.
- Wild species around croplands beneficial to agriculture and household use which deserve their conservation.
- Composite of plants that repel pests or act as pest traps, natural enemies of pests, attract bees and natural enemies, provide reservoir for the natural enemies, pollinators, wild relatives of crop plants, improve soil

health and prevent erosion, and wild food plants that can be found growing wildly nearby agroecosystems.

**Answer to the objective number 7 stated:** determining challenges in the conservation of diversity of agricultural resources.

These are the challenges intercepted through this research that call for new approach to conservation of diversity of agricultural resources as presented in the table below where majority of the respondents accept as true that practice of kaingin system and issues on the negative impacts of land intensification and the abandonment of land more particularly to high nature value farmland areas and there is negative impact of intensive agriculture on environment quality that perceived the highest mean score of 3.33 over 4.00 value. Meanwhile, they agree the intensification of farmlands cause decline of bird species,

varieties of nearby farm beneficial organisms, wildlife, plant diversity and soil biodiversity. Landowners, farmers and farm owners have relatively believed introduction of community development activities like conversion of untapped agriculture potential land and forest as a challenge, together with the continuation of low-intensity agricultural practices to restore of large number of highly valued wildlife species and semi-natural habitat types. Moreover, in their perception of creating program and develop strong diverse agricultural system with its capacity to feed the growing population while maintaining ecological integrity and viability of habitats and species in the region. Based on the value of the weighted average (2.70 out of 4.00 maximum value that can be obtained), which fall for decision value of “agree”, it can be claimed as revealed in the table that there are challenges in the conservation of diversity of agricultural resources of the region that need attentions.

CHALLENGES	Mean	Std.	Remark
1. The influence of monoculture farming and the negative impact of intensive agriculture on environment quality and its dependence on non-renewable resource.	3.12	.132	Agree
2. continuation of low-intensity agricultural practices to restore of large number of high-valued wildlife species and semi-natural habitat types.	2.40	1.263	partially agree
3. Create free charges and access of local farmers to various reserves varieties and species in the repository centers anywhere in the region/country.	2.73	1.356	Agree
4. Create program and develop strong diverse agricultural system with its capacity to feed the growing population while maintaining ecological integrity and viability of habitats and species in the region.	2.41	1.231	partially agree
5. Insert concept of future farmers of the Philippines in high school level curriculum augment constructive community attitudes, and values of indigenous knowledge towards agriculture resources.	2.51	1.222	Agree
6. Introduce new concept of infra development in modern farming and landscape without compromising the natural and forest resources, where farmland habitats and farmland biodiversity rest on.	2.47	1.164	Agree
7. Monoculture farming incentives that cause environmental problems related to biodiversity and conservation over traditional farming or farm practices in the diverse agricultural resources.	2.63	1.465	Agree
8. The intensification of farmlands cause decline of bird species, varieties of nearby farm beneficial organisms, wildlife, plant diversity and soil biodiversity.	3.00	.117	Agree
9. The introduction of community development activities like conversion of untapped agriculture potential land and forest.	2.43	1.495	partially agree
10. The practice of kaingin system and issues on the negative impacts of land intensification and the abandonment of land more particularly to high nature value farmland areas.	3.33	.166	Agree
<b>TOTAL</b>	<b>2.70</b>	<b>.979</b>	<b>Agree</b>

Table 3:- Challenges in the Conservation of Diversity of Agricultural Resources

Legend:

- 3 = Agree
- 2 = partially agree
- 1 = disagree

Decision Value:

- 0.00-1.94 = disagree
- 1.50-2.44 = partially agree
- 2.45-4.00 = Agree

**Answer to the objective number 8 stated:** Formulate and recommend strategies for conservation and biodiversification of agricultural landscape farming.

Here are few of the several rules and regulations collected and evolved in the literature as implementing guidelines for agricultural development which traces agrobiodiversity management in the region. **Genetic Resources** – the Policies and Regulatory Mechanisms for Management of Genetic Resources Philippines Executive Order 247 (Series of 1995) prescribes the guidelines and establishes a regulatory framework for the prospecting of biological and genetic resources, their by-products and derivatives for scientific, commercial, and other purposes. The Philippines Agricultural Sector Report to the Convention on Biological Diversity (CBD) (Philippines 1995a) states that Trade Related aspects of Intellectual Property Rights (TRIPS), provides for the option to patent plant varieties or to adopt an effective sui generis protection. The Philippines Republic Act 7308, or the Seed Industry Development Act of 1992, promote and accelerate the development of the seed industry, particularly to conserve, preserve, and develop the plant genetic resources of the nation and promote the seed industry as a preferred area of investment. It encourages industries to engage in seed research and development in mass production and distribution of good quality seeds, protection of local seed industries against unfair competition from imported seeds. **High-Value crops and Market production system** – high-value crops are defined as non-traditional crops that includes coffee, cacao, various fruits, potato, purple yam or ube, various vegetables, cut flowers and ornamental plants among others, and “traditional” crops include rice, corn, coconut, sugar and others. From here, the Philippines Republic Act 7900 also the High-Value Crops Development Act of 1995 promotes production, processing, marketing and distribution of high-value crops for export to augment the foreign earning of the country. This section could provide asset to property conservation, design, enrichment

and utilization of agrobiodiversity through evolution of high-yielding crops and livestock. Its trust also confines conservation of traditional varieties although there is little shift to new commercial varieties among small-scale traditional farmers. **Rights of indigenous people** – this concerns on the property rights and equitable sharing of agricultural genetic resources. After having consultations with the respondents or the stakeholders, this review have only gathered information on the following based from the narration that has been linked to national legislature that Strategy III of the Philippines BAAP (1997) promotes formulation of an integrated policy and legislative framework for the conservation, sustainable use, and equitable sharing of benefits of biological diversity, and addresses identification, delineation, and management of ancestral domain of indigenous people, and to promote the right of indigenous cultural communities. Conversely, this article would like to infuse a possible regulatory access to biological resources of the country, respect local knowledge and information relating to biological resources, and knowledge sharing between and among locals and stakeholders, protect and rehabilitate endangered species. All of these be constituted requisite mandatory to all citizens toward natural resources protection and management.

**Answer to the objective number 9 stated:** Determine the relationship among socioeconomic, farm size and farming as an occupation of the respondents.

In socioeconomic of the respondents, the indicators reveal no significant relationship between the size of the farm and the farming as occupation a mean score of 23.56 for the farm size while farming as occupation garnered 27.14 mean score. Its (df = 98; t = 0.713; p > 0.05) values reveal no significant difference. Therefore, there is no significant relationship between the farm size and the farming as occupation among the respondents.

Socio Economic Status	Variables	N	Mean	Std.	df	t	Sig(P)	Remarks
	Farm Size	115	23.56	5.59	98	0.713	0.05	Not Significant
	Farming as Occupation	115	27.14	4.19				

Table 4:- Summary of T-test showing relationship between Farm size and Farming as Occupation

**V. SUMMARY**

This research evolved only on the benchmarked community attitudes, challenged and their fundamental components in managing agricultural resources for agrobiodiversity. This claims that tandem of agricultural resources and commodities is the teeming human population in the region couple with its level of consumption leading to a demand of improving agricultural production system in an attempt to increase food supplies in the galleries and alleviate poverty, therefore, a shift of paradigm in farming system overwhelm planners along agricultural production systems and ensure impact of these systems on the conservation and use of biodiversity. Human can also be threat to the forest biodiversity through extensive logging,

habitat degradation, kaingin and pests and diseases which is difficult to manage sustainably. The increasing demands for food, fuel and income can drive the overexploitation of both agricultural and non-agricultural bioresources by means of hunting, fishing, wood cutting, logging, harvesting of wild wooded trees for handicraft and industrial purposes.

On the benchmarked community attitudes towards agricultural resources management, valued most importantly on self-assurance, cooperation among aboriginal communities and landholders could protect the cultural heritage sites, private property and diversity of the resources. It is believed that diverting of diversified farming to industrialized farming deteriorates wildlife and exploit natural agricultural resources. Clearing of native vegetation



has substantially reduced the abundance and existence of native plants and animals in the region while community development program introduced in the locality have caused exploitation of the agricultural resources. Community attitudes towards agricultural resources management in the region is most important.

From qualitative point of view, agricultural production systems introduced within the past decades increase food supplies in the galleries and undeniably alleviate poverty. The intensification of the agricultural production systems attained by sacrificing components of natural resources (e.g. conversion of wild land into industrialized agriculture, exploitation of biodiversity resources, shifting of diverse small-scale farming into homogeneous large-scale commercial farming coupled with the successive utilization of modified species, varieties that requires high inputs of chemical fertilizers and rigid application of pesticides, and increased cultivation of exotic cash crops for rigorous incentive benefits.

Respondents have to be equipped of the approach to conservation and management of agricultural resource. Therefore, community residents or the land owners/farm owners need to be enhanced with more emphasis on diversity of agricultural resources of the region since they do not have thorough knowledge about the phenomena. Landowners knowledgeable of diversity of agricultural resources would lead himself merge into a universal principle of conservation and management along way of protecting and preserving local species and other forms of wildlife organisms within agricultural landscapes.

Key aspects of declining diversity were listed five (5) indicators through qualitative method such as indigenous crops and livestock varieties, wild species within agricultural ecosystem, deteriorating land level diversity, misconception of Agrobiodiversity, opportunities and practices for change.

Several approaches in conservation and management of agrobiodiversity explored in this research such as the traditional knowledge of agrobiodiversity, diversity in land, soil diversity, diversity that mitigates pests and diseases, crops, soil and genetic resources, biodiversity in agroecosystem.

These are the challenges intercepted through this research that call for new approach to conservation of diversity of agricultural resources like the practice of kaingin system and issues on the negative impacts of land intensification and the abandonment of land more particularly to high nature value farmland areas. Meanwhile, intensification of farmlands declines bird species, varieties of nearby farm beneficial organisms, wildlife, plant diversity and soil biodiversity. Relatively, introduction of community development activities like conversion of untapped agriculture potential land and forest as a challenge, together with the continuation of low-intensity agricultural practices to restore of large number of highly valued wildlife species and semi-natural habitat types.

Several rules and regulations collected and evolved in the literature as implementing guidelines for agricultural development which traces agrobiodiversity management in the region that promote and accelerate the development of the resources, encourages industries to engage in seed research in non-traditional crops that includes coffee, cacao, various fruits, potato, purple yam or ube, various vegetables, cut flowers and ornamental plants among others, and “traditional” crops include rice, corn, coconut, sugar and others and promotes production, processing, marketing and distribution of high-value crops for export to augment the foreign earning of the country.

## VI. CONCLUSION

The final transcript of this research wrapped in benchmarked community attitudes, challenged and their fundamental components in managing agricultural resources for agrobiodiversity and concretized its finding-based from the collected experiences of respondents that recognized and concluded conservation and management of agricultural resources sustains agrobiodiversity. Likewise, it helps diversifying agricultural products and enhance income opportunities making farming system more stable and vigorously sustainable. Effective use of agricultural resources and environment towards conservation of its diversity reduces the pressure of agriculture in indistinct areas, protects forest and other lifeform species, reduces dependency on external inputs and problems to region, sustains stability of the organisms’ habitat, conserves and increases fertility and natural health of the soil. This process therefore, eventually increases productivity, enhance human nutrition, food security and economic returns and thus contribute to quality of life of the community.



Fig 1



Fig 2:- Map of ZamBaSulTa  
Source: <http://www.zamboanga.com>

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