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Agritechnovation Hub and Smart Knowledge Processing Outsourcing (Kpo) Ecozone Masterplan Design Potentiality at Isabela State University Matusalem, Roxas, Isabela

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ABSTRACT

This study seeks the potentiality of an Agritechnovation Hub and Smart Knowledge, Processing and Outsourcing (KPO) Center as a Knowledge, Innovation, Science and Technology (KIST) ecozone development through combining technology and agriculture as an innovation. As universities are dispersed around the Special Economic Zone, students' knowledge levels will rise and job chances will increase. Rapid urbanization among major cities in the Philippines created so much congestion and exceeded it carrying capacity to provide proper housing and social services to its residents. The cost of living in cities is highly expensive and most of the graduates from the countryside add up to its overcrowding due to lack of opportunity. The Special Economic Zone's goal to move developments in the provinces is of good help to decongest Urbanized cities and give more opportunities to graduates in the provinces. Roxas Isabela has idle lands and the need to develop a Land Use Development Plan is needed that is why the Agritechnovation Hub and KPO center as a KIST Park is proposed to utilize this idle land in compliance with the LUDIP Act. This study, clearly shows that KPO centers are needed gaining 32.2% agreeing to have a KIST development in the area Moreover it revealed that (15.25%) of the respondents wanted to have agriculture as its major component Lastly, Education comes with 13.56% out which means that these three components are the strength of campus for a synergistic activity between the industry partners through research and development. It is also concluded that Agriculture through technology in research and development can create a wide array of opportunities for local and international economic growth and capacity building among the people.

INTRODUCTION

The municipality of Roxas is a first-class municipality, and it is good to locate the development since the infrastructure and utilities are already available, which is one of the major requirements of PEZA. Through the development of an Agritechnovation Hub and KPO Center.

The development was composed of a one-stop shop, a Research and Development Building, a Knowledge Processing Building, Guestel, a hotel, a Conference Building, and Administration Building including a motor pool, and a Fabtech Area. Through this, the operations of the Agritechnovation Hub and KPO center as a KIST Development will surely meet its needed facilities to be provided for international and local economic and techno-scientific activities. Farm and resort will be additional amenities in the area to immerse and have a proper venue for research and leisure activities. With these, it will surely embrace by young generations to bring back the love for agriculture and value its importance to the community. The green architecture was adopted in the development since it has been one of the best strategies to adapt to prevent climate change impact and to at least achieve sustainability. Water and utility systems are provided with solar and energy-saving equipment with low VOC paints used and double-glazed glass windows to have better resistance to hot climates. With these developments, the ISU Roxas Campus graduates and students including its residents would have a better opportunity for employment and immersion.

Statement Of The Problem

Younger generations usually do not love agriculture; however, it is necessary to look into this problem to create an Agritechnovation Hub and KPO Center as Knowledge, Innovation, Science, and Technology (KIST) Special Economic zone development which combines agriculture and technology as an innovation. The backbone of the economy in the Province of Isabela is agriculture and the need to innovate in terms of development is very relevant to bring back and sustain the agriculture sector in the province.

The need to develop idle lands shall be done by SUCs so that it will not be recovered by the Philippine Government to be utilized. The compliance of the ISU Roxas Matusalem to the LUDIP Act will be one of its topmost priorities to maximize the best use of their idle lands. There is a move from the Philippine Economic Zone Authority to create countryside development and one of its components is a KIST Special Economic Zone which is very much suitable to ISU Roxas's current development plans. The graduates of ISU Roxas usually go out of town and abroad to have better employment opportunities and this development will ease the problem

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among its graduates and residents.

Objectives of The Study

This study will deal with the research on the creation of the 15- year master plan that could be used by the ISU Roxas Campus for PEZA submission and approval. The objectives of this study also include the following:

1. Identify the policies and standards needed for Special Economic Zone development.
2. To assess possible strategies in the design and construction of the master plan.
3. To design a master plan suitable for the Agritechnovation Hub and KPO Center as an economic zone with a KIST component.

Significance of The Study

The results of this study will give concepts on how to make sustainable developments on the Agritechnovation hub and KPO centre as a KIST component on SEZ zone developments among the developers and SUCs. This study will help researchers on what are the possible components and considerations to achieve proper facilities and design factors that will make the development successful. This model will be useful in the application of ISU Roxas Campus in the PEZA for further approval of the requirement.

Limitations of The Study

The limitations of this study will merely on the bounds of ISU proposed development and on the following criteria:

1. A detailed estimated cost of development and computations of Return of investments are not part of the study.
2. The campus's infrastructure department will complete the comprehensive engineering design and estimates, and these will not be included in the research. Only the conceptual master development plan is the subject of this investigation.
3. An analysis of the environmental impact of ECC is for further study however site SWOT analysis is part of the process.
4. Applications for land use changes and disputes about land titles are not included in the study.

MATERIALS AND METHODS

There are two types of methods used in this study both qualitative and quantitative research to achieve its vital results. A comprehensive and research on essential factors that may affect the development was thoroughly studied for the benefit of ISU Management for implementation and SEZA for submission.

Location of the KIST Developments

The location of the study site is in Barangay Matusalem Roxas Isabela Province with a relatively flat terrain that is appropriate for the development (Figure 1).

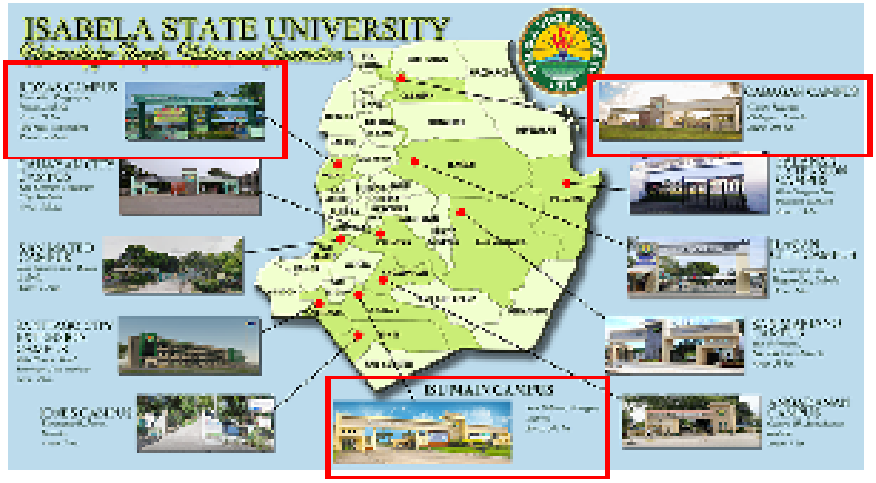

Figure 1: The Site (Barangay Matusalem, Roxas, Isabela)

Data Collection and Instruments Used

There are second hand data's given by ISU Management and PEZA authorities that has been useful in the conduct of this research. Drones, cameras and online researches are the instruments used by the researchers to come up with the results of the study and carefully analysed and synthesized. Survey questionnaires with proper consents among the authorities were provided to make it more comprehensive and got the best results in achieving the objectives of the study.

Descriptive Method

The descriptive technique is used with the evidences gathered by different persons and agencies; this provided a proper narration on the factors that make the development achievable and sustainable. The services offered in the development was aligned with the planning department of ISU Roxas and with the stakeholder consultation and recommendations.

It was also completed to identify the design elements and frameworks in each of the SEZ's operational sectors as

well as to characterize the metrics that best support the SEZ's existence in the local community. The economic zone's geographical and geopolitical characteristics have been carefully assessed and combined with the intended attributes.

Unstructured Personal Interview

The researcher also interviewed key experts in ecozone developments in Baguio PEZA office and it was found out that the ecozone permits and standards have its own by laws for the ISU Roxas to accomplish. The project manager of a single KIST zone in Batangas was also interviewed to have an overview on how the project was successfully done from design to construction.

Case Study

A benchmarking was done with the ISU team on Batangas and carefully conducted a visit on the construction of the ecozone and its vital components. It seeks how they catered both local and international economies with research activities. Equipment's and offices were visited and they have shown mapping and cutting machines that is merely part of their innovation on the development.

ISU Roxas Stakeholder Meeting

To have a consensus design of the master plan a stakeholder meeting was conducted with the LGU officials, ISU Officials, students and local residents. The conference venue was in ISU Roxas and it lasted for half day. The researcher collected all the concerns and desires of the stakeholders and adapted mostly of their suggestions and gave solutions to their concerns.

Analysis Using SWOT Analysis

Site analysis through actual observation on the site clearly gave an idea to the author to come up with a better master plan design. The geographical and environmental characteristics of the place was analysed and vital in the crafting of the development plans. These are essential for the determination of its impact among sectors of the society. Through this, the ecozone were oriented properly and treated architectural and building utility features to make it more comfortable.

Survey Method

For the Roxas special economic zone, a purposive sample survey approach was used. The purpose of the survey was to find out what conditions, in the respondents' opinion, are necessary and preferred for the construction of an economic zone. Purposive sampling was used and it is composed of 60 different respondents by various sectors like ISU Officials and students, local residents and LGU Roxas Officials.

Table 1: Respondents Distribution

Area of Survey	Respondents	Respondents Number	Total
Municipality of Roxas Isabela	Students from Isabela State University Roxas and Heads	30	30
	Local residents and Municipality of Roxas Officials	30	30
	Overall Total	60	

RESULTS AND DISCUSSIONS

Policies and Standards in KIST Ecozone Development

The legislative framework and administrative protocols for the development, governance and functioning of various ecozones in the Philippines are established under RA No. 7916. This Act creates the PEZA under the first portion of this article. Incentives for sectors seeking to invest, assistance for private enterprises, and recognition of the private sector's unwavering role would all be offered, according to Section 2 of the policy declaration. In addition to encouraging and favoring the use of domestically produced goods, domestic materials, and Filipino labor, section 2 offers strategies to assist them become more competitive.

In order to generate jobs, particularly in rural communities, cities, and the provinces, this strategy pushes the administration to promote, fast-track, and incur feasible and composed financial, social, and industrial growth especially to countryside. By creating economic zones at strategically important places across the nation and attracting lawful foreign investment, its main goals are to empower the people and improve their level of living. The Philippine president will determine what is required to create an ecozone after consulting with PEZA and evaluating the results of an extensive engineering and feasibility assessment that satisfies the following requirements:

(a) The lands of the locations of economic zone shall be in a growth center in the region. Hence, the municipality of Roxas in the province of Isabela is a focal point for development and progress.

(b) The infrastructure required for the ECOZONE zones, including telephones, roads, railroads, airports, ports, and the capacity to support various improvements, must already be in place. Cauayan Airport is 50 minutes distant, and ISU Roxas offers reliable utilities. Nevertheless, the railway's location is unknown.

c) In order to be used, ECOZONE needs to have access to a supply of water and energy; Luckily, the ecozone proposed in Roxas has connection in Roxas Water line.

(d) Land for residential areas, commercial, industrial, and future expansion must be accessible to user's workforce. For the comfort of its staff, the KIST facility is furnished

with a number of guestel amenities.

(e) The availability of trained, semi-skilled, and trainable non-skilled laborers must be considered while creating an ecozone. Preferred employment in the SEZ may be granted to students and recent graduates of ISU and its neighboring schools.

(f) The development will benefit both local and foreign investors in the future; the areas must be substantially more favorable than the existing economic zones and have the potential to be profitable in the future.

(g) Preferably positioned properly. Matusalem Roxas Campus is accessible by a road connected to different locations of the campuses.

(h) To deter smuggling attempts, the ECOZONE should be located in an area where security measures are easily visible. DENR and police agencies try to avoid smuggling along the area.

Experts in The Special Economic Zone Interviewed

The author decided to consult with an expert in ecozone development. The OIC Chief told the researcher in an interview that the PEZA Board Officials will carry out a thorough a series of examination of the KIST Special Economic Zone establishment's Economic Zone Development. Only one KIST economic zone—Batangas State University KIST—has been approved by PEZA, while two other schools are in the application stage. In order for both the industry and KIST to gain from research and development, especially in the fields of innovation and research and development, the special economic zone should aim to work in tandem with the industry.

Furthermore, research projects that are models or prototypes may be manufactured in the KIST special economic zone and then mass-produced for use in industry. The KIST is only good to manufacture prototype researched models from the industries because the ISU's land use is still institutional. However, the municipal or city council's approval is still required to change the property use.

Strategies in Designing The Ecozone Masterplan

Isabela State University's KIST economic zones were established in accordance with the planning department. The author carried out its survey and integrated all pertinent KIST recommendations in ISU Roxas to meet the needs and desires of the ECOZONE's potential consumers. Before incorporating it into the ECOZONES master development plan, the author visited the Roxas Campus, which has a substantial land holding, and consolidated information's aligned to their vision on the development.

A SWOT analysis of each development area revealed that most of the infrastructures required for development, including transportation access, power supplies, road networks, telecommunications, water supplies, and adjacent airports, were present. This was the PEZA's primary requirement. The PEZA's main objective is to promote economic mobility among impoverished areas, which will support each community's development. The location is perfectly situated to serve as the hub for further growth. The site's qualities are excellent for development since Roxas Campus has a large carrying capacity for KIST ecozone development and broad regions open for growth. According to the majority of study participants on the Roxas campus, KIST park ought to be built on the ISU campus. Despite having modest earnings, the majority of respondents are college graduates who might be a possible workforce of the development since this was PEZA's primary requirement. The PEZA's main objective is to promote economic mobility among impoverished areas, which will support each community's development. The location is perfectly situated to serve as the hub for further growth.

Potentials for Infrastructure Development

Infrastructure development will be mostly done with mid-rise structure since the respondents generally looked for mid-rise structure in the survey questionnaires that had been floated. Technologies like the use of green building concepts were adapted in then master plan to lessen the impact of climate change.PWD parking and provisions was carefully designed to make it more inclusive. Walkable and bikeable access are part of the design of the masterplan. Retention ponds will mitigate the flooding in the area and served as a source of water when watering the landscape.

The Profile of Kist Site Roxas Campus

Profile on Natural Characteristics: ISU Roxas is mostly flat terrain and it is bounded by the fisheries research center of the province which can be used in the farm tourism resort. The site is agricultural land and ready for development. It has two significant lots for development which is why a footbridge has been provided to ensure the safety of going back and forth from one site to another among the users. It has a great mountain view of the Sierra Madre and a good drainage system. However, the need to divert canals from NIA shall be established. It is the least land area among the three sites. The other lot where the farm tourism is located has a small creek which can be a source of water for watering the organic farm along the area. Flood rip rapping is designed on its side to prevent scouring of the soil during rainy days. Along the creek, there is a slope that is proposed to put kangkong, gabi, and other plants that need water and are susceptible to water. The site is near the Summabot view deck and it could be a means of leisure activity among the economic zone users after work (Figure 1).

Profile on Education

Many Roxas residents are from mountain provinces. They have a high level of education and could be employed in the special economic zone. Criminology is the main subject offered by ISU Roxas, which also provides courses in agriculture, IT, and fisheries. Because there are fewer

Figure 2: ISU Roxas Site
Source: ISU Roxas Planning Department

chances, Roxas residents will spend less money on jobs in distant places like Metro Manila, the City of Ilagan, and Cauayan City.

Profile on Social Factors

As a sign of their culture, the Kalinga people, who made up the majority of the early settlers, were farmers and celebrated the Pinakbet Festival. As part of their cultural history, they celebrate the Pinakbet festival, which highlights their primary agricultural output, which is primarily vegetables. Particularly among tourists, especially those from other countries, the residents of Roxas Isabela are incredibly welcoming and you can sense their sincere concern. In contrast to other nations, where bread and potatoes are the primary sources of carbs, they rely on rice as part of their daily diet. The lack of hotel facilities in the area makes it necessary to build hotel facilities inside the special economic zone to give both domestic and foreign tourists a suitable place to stay. Their culture includes mommas, and as a result, you may notice people with red teeth. They eat momma as a way to unwind and enjoy social interactions.

Site SWOT Analysis Results

Strengths – The land is practically empty and suitable for constructing building since there are no numerous existing structures to consider

1. Along the site, there is an existing research facility of fisheries research
2. The condition of the land is relatively flat
3. Connection on electricity, water, drainage is evident
4. Accessible to the other satellite campus of ISU
5. View of Sierra Madre is very nice
6. Flooding does not occur in the area
7. Strong political will among the LGU and support

Weaknesses- Far from national highway

1. Narrow roads
2. Flooding from creeks can cause overflow

Opportunities

1. Small scale and medium industries have the opportunity to use the facility
2. The development can be a source of OJT among the students especially in the hotel and offices
3. Financial funds through PPP and BOT can be a source of funding
4. Linkages to DTI, TESDA and PEZA is Possible
5. Prototypes made by research can be done in the KIST development
6. Can attract foreign linkages and investment

Threat – Earthquakes are common and typhoons on the site

1. Concreting may lead to heat island effect
2. Congestion on traffic is possible
3. Environmental degradation is a possibility
4. Students might get drowned in the creek

Results Of Stakeholder Meeting

On December 6, 2022, a stakeholder meeting was held at the mini theatre on the second floor of the Roxas Matusalem Campus. The Executive Officer of ISU Roxas, along with LGU officials, the PEZA Director of the university, important officials, students, and citizens, attended the stakeholder meeting. In his opening

remarks, Dr. Eddie Peru introduced the author and expressed gratitude for helping to create the master plan for the KIST economic zone. He also reaffirmed that the university's goal of becoming a preeminent research institution is almost a reality. The executive officer wanted to have footbridges and a covered walkway connecting the site of the farm resort KPO and other buildings for the convenience of the users. The Dormtel will be named Guestel since this is the programmed name of the building in the master plan.

To reach a consensus, confer with all parties involved, and educate them on the critical role that SEZs play at Isabela State University, the designer presented the master plan. The author carefully clarified that the one-stop-shop area of development is only meant for the residents of the Roxas Matusalem area and would serve as a source of revenue for the Roxas Campus when one of the LGU officials inquired about it after the presentation and whether the residents would be permitted to rent and use the facilities. To maximize the advantages of establishing an economic zone, the ISU system will benefit from development policies. Additionally, the researcher stated that all development plans will adhere to the Philippine national building code regarding the required parking area ratio and subsequently be added with 5% contingencies for future population growth. The dean of the College of Criminology is also worried about the number of parking areas, seeing that it may not be sufficient to meet the need for parking. To guarantee the safety of the users within the special economic zone, the dean also reaffirmed the necessity of adequate fencing.

The site's current water irrigation system in the event of flooding is another urgent worry of the stakeholders. To reduce and manage floods in the area, the researcher clarified that engineering design solutions are integrated and that excavation and water-impounding areas are part of the design. Additionally, each building has multiple rainwater harvesting systems built to flush toilets and prevent flooding according to the master design. In order to lessen the negative effects of climate change, green architecture technologies such as the use of Low-E glass, renewable energy sources like solar panels, vertical gardens, and roof gardens, sunscreen louvers, clerestory windows, LED lights, and eco-friendly air conditioning are incorporated into the design. In addition to a vermiculture area that will contribute to revenue creation and supply organic fertilizer for the agricultural area, the MRF will also minimize landfill over crowding

Structures Preference Result

Despite their strong agreement with the modern building design and built-in surroundings, most respondents were unclear about the existence of high-rise structures. As a result, most structures shall be medium-rise as agreed by the respondents. The urban park is the KIST ecozone's primary tactic for establishing a safer walk and atmosphere to its users, which will enhance the working environment and promote good design. Furthermore, parks, especially in the nights, can be utilized to encourage social interaction. In addition to serving as a natural cooling element, parks are designed to draw biodiversity to the area and mitigate the effects of urban island heat.

Preference On Ecological Protection

Solar panels installed on the rooftops of various buildings demonstrate the appropriateness of renewable energy use by optimizing solar energy; cross ventilation allowed for the integration of green construction concepts, proper orientation, and environmentally friendly material selection in some areas of the master plan; the development plan have enough area, and will include a flood mitigating areas and provisions for flood tunneling mechanisms; the master plan incorporates technologies like automated fire sprinklers and heat detectors to protect people and property exclusive along the ecozone; and STP and MRF will protect the environmental degradation of the place

Economic Oportunities

Developing a knowledge economy and worldwide connections through research and development are two of the KIST economic zone's policies. Research and Developments in this area will become a source of economic opportunities and create an innovation in terms of students and industrial partners immersive activities.

The FABTECH area, 3d printers, Lazer cutters and other technological advancement will be part of the economic profit generations on the development. The use of artificial intelligence (AI) in agriculture has made noteworthy development in farm management probable by offering new ways to enhance farming procedures this may also be a possible area of activities inside the ecozone.

Although accommodations for local business sector shall have the opportunity in the development, foreign direct investments had been the majority of the favored locators. Small-scale restaurants and retailers are a feature of the growth in densely populated places, providing food and other goods and services that the community can use to foster economic stability through entrepreneurship.

Business Environment

In exchange for tax holidays, the majority of respondents supported a SEZA program that would give new business owners tax incentives for four to six years. The policy that will be proposed in the ECOZONE would offer tax advantages to locators and renters that adopt green technologies. It is possible to make foreign direct investments within the KIST economic zone as long as the items are service-oriented and made with exporting in mind. The establishment of an ecozone is justified as the KIST locations' population agreed to work inside the specified Special Economic Zone. The KIST ecozone welcomes international workers, notwithstanding certain limitations imposed by PEZA laws.

External Communication

Connectivity in reliable and faster internet access will be part of the masterplan. The A website shall be developed by the ISU ICT Department to accommodate foreign and local communication activities. The rule and technique for disseminating information includes the marketing of ads in newspapers and other publications. Facebook ads and TV networks in the master plan are part of the proposed strategy for marketing.

Policy Provision

Penalties for violators will be a part of the master plan policy, which will ensure environmental sustainability and livability. Tax breaks for companies that practice environmental responsibility will function as a policy that the LGU will enact and approve. Companies that gather rubbish to apply the 4Rs are also eligible for tax breaks. The community inside the economic zone will become healthier and more environmentally friendly as a result. Allotting funds for sustainable research and development is essential to maintaining the viability of the ecozone and filling up any gaps that arise while it is operating. The respondents agreed that the LGU may be a source of funding if additional alternative BOT between investors was required for the availability of cash.

Green Architecture Integration

Rainwater harvesting, for example, is a green design technology that all buildings must have placed in the lower basement and repurposed for toilet flushing. Additionally, this will aid in lowering water usage, particularly during the wet season. Since the Philippines is a tropical nation, exploiting heat energy is one of the ideal ways to gain cleaner source of power in the master-planned ecozone. Photo-voltaic cells on roof decks and roofings provisions are part vital components to ensure a much lower impact on the environment, most likely during summer. Tempered glass and Low-E glass on the glass walls will limit heat gain inside the structure, which lowers the need for air conditioning during hot

The design incorporates cross ventilation and the use of natural daylighting to maximize wind-regulate solar exposure and ensure proper thermal comfort within the structure. A green wall was also incorporated into the design to improve biodiversity in the area and reduce the building's effect on the urban island heat island effect. A holding pond was built to reduce flooding within the KIST special economic zones, which were master-planned. The master plan called for e-trikes, bike lanes, and bike parking in order to lessen the development's carbon footprint. Furthermore, a thoughtful walkable urban design can improve the entire experience of the master-planned KIST development and lessen user stress. To improve the porosity of each parking lot and enable rainfall to percolate through, grass must be planted in the center. To ensure efficient data management and energy usage oversight throughout the development project, as well as safety in the event of a fire or other emergency, it is recommended that artificial intelligent equipped sprinkler systems, maintenance protocols, and digital electric, mechanical and plumbing monitoring systems be integrated in every building. At the building's entry and departure, each employee has heat-detecting monitoring equipment in case the spread of Airborne diseases and other viruses is easily observed. There is a quarantine chamber in each building that is designed to be less accessible to the general public.

The park will serve as the lung of the entire KIST development and a public area for evacuation in the event of an earthquake. Low volatile organic compound (VOC) paint, which is inherently a more environmentally friendly and sustainable option than regular paints, must be used for all paintings. Institutional buildings, like commercial buildings, usually have all-white paint because white is an easy colour to paint. Hazard vaults and sewage treatment facilities will ensure a high standard of environmental quality in KIST Park, which is a critical requirement for obtaining the ECC, or Environmental Compliance Certificate, from the DENR. MRF and vermiculture will further improve the area's waste management facilities.

Strategies In Construction Management

In keeping with Batangas State University, ISU's management will assemble a construction project management team to ensure that the facilities meet high standards at every stage of the process, from design and bidding to construction and operation. In order to properly design the structures of all buildings to value engineering, a soil test must be performed at every construction site.

To prevent soil from arriving from other sources, the author recommends using an excavated foundation to backfill all areas that need it in terms of construction management. Due to the utilization of I-beams with wide flanges and a metal deck on its structural system, it would be finished faster than with traditional construction.

Precast concrete, prefabricated SRC, pre-engineered steel structures, prefabricated SRC wall panels, and earthquake-resistant EPS panel technologies are the preferred wall-building methods for faster, more efficient, and well-insulated panels suitable for tropical countries. This will lower the amount of heat gain within the building and is easier to install. To improve power loss efficiency, automatic transfer switches must be installed in all electrical systems. Emergency lighting and alerting systems must be incorporated into development designs in order to safeguard people's lives, health, and

The Masterplan Composition

The business will process and trade exportable knowledge, innovation, and technological goods and services. The SEZ Development Project will be called "ISABELA AGRITECHNOVATION HUB and SMART KPO CENTER" (Figure 3). The building's infrastructure is SMART KPO Techno Hub, which is outfitted with SMART Solar Generating Power.

In order to serve both domestic and foreign locators, the master plan calls for an Administration Building and Business Establishment (Campus IGPs, showroom, One Stop Shop), a Research and Development Building, Knowledge Process Outsourcing (KPO) and Support Services, a Convention Center, and a Guestel. A hotel, an agricultural resort, an ISU Village & Park, and an organic urban gardening landscape are all component of the master plan. In the KIST Economic Zone, which serves both local and foreign economies, a showroom and one-stop shop allocation are efficient ways to make money and display a range of goods and services to workers, residents, and students. Since this development will draw researchers, tourists, other scientists, and locators who wish to employ the resources for research and innovation, local governments will profit from the revenues generated by it. To further preserve the surrounding area as a real laboratory for organic urban gardening and future expansion in the event that the KIST is successful, all modifications in lot 3698-B were compacted. Low-E glass and rainwater catchment areas, solar panels, proper orientation using a tropical architecture with louvers and large overhangs, a water system driven by wind-generated pumps, and the effective use of technologies like artificial intelligence heating devices are just a few examples of the green technology architecture design interventions incorporated into the KIST Development. In addition to a park to restore users' well-being after a demanding workday, fire prevention measures are offered to protect the lives, health, and property of the offices.

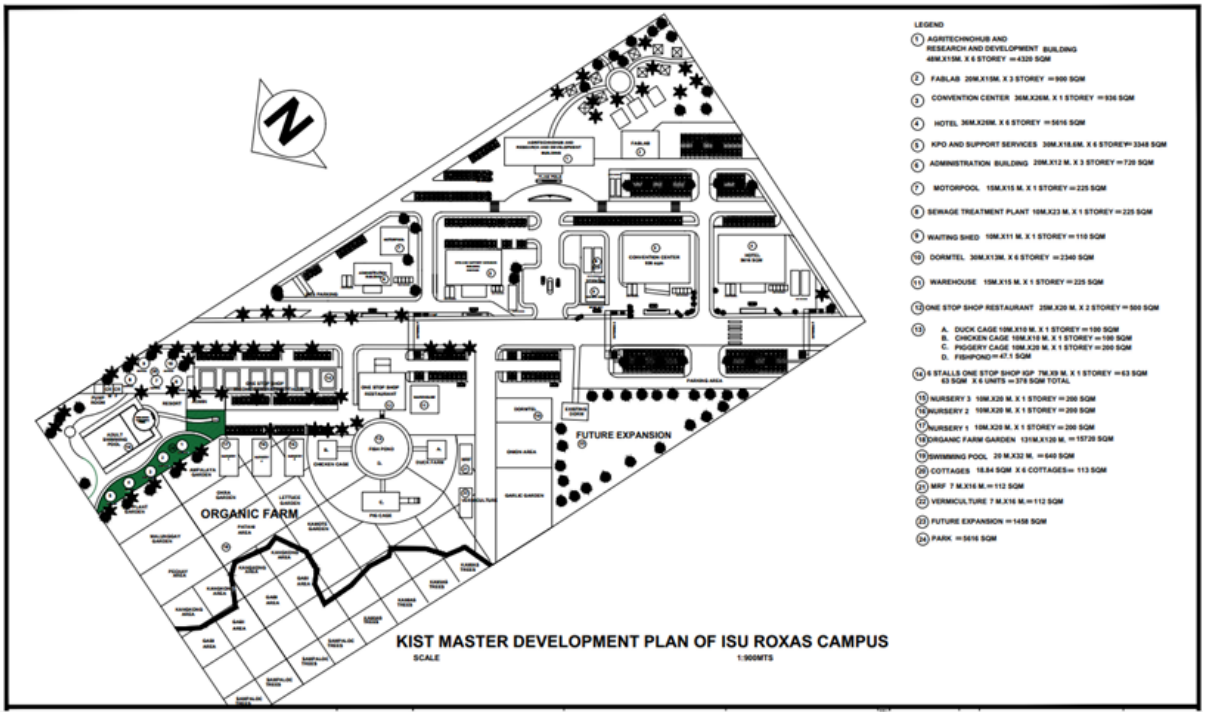

Figure 3: Master Plan of Isu Roxas Kist Park Special Economic Zone

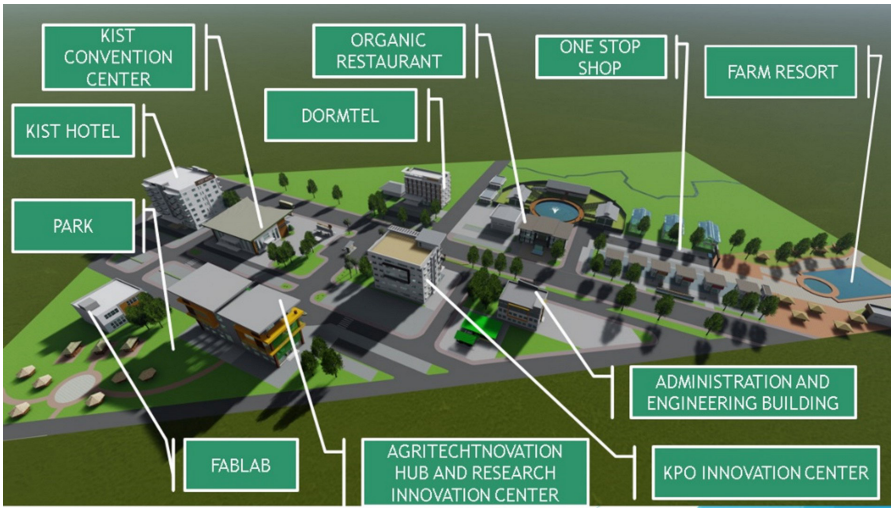

Figure 4: Aerial Perspective View

Summary

To improve the education of Isabela State University students and turn rural communities into ones that can sustainably and independently absorb economic activity, the KIST Special Economic Zone was established on the campus. Because the KIST Roxas have good human resource generation, neighboring sites and land uses are primarily dependent on agriculture and livestock, and they already have a proper utility infrastructure in place—the most important prerequisite for a PEZA—their social, cultural, natural, and educational characteristics have a great deal of potential to develop into an economic zone. Enhancing community sustainability and quality of life will be greatly impacted by the ecozone development which offers different employment options.

Creating locators as a policy within the development framework permitted by its approved plan is one of the author's recommendations, taking into account the necessity of respecting it carrying capacity to avoid environmental harm and urban sprawl. This strategy will guarantee that Isabela State University will gain a great deal from their presence. Locators who organize green technology and embrace industrial symbiosis concepts will be eligible for tax breaks. Last but not least, the KIST ecozone is proof of the institution's goal and aspiration to become a preeminent research university since it has the plan mandated by the LUDIP legislation to improve the optimal use of land among the many uses of land.

CONCLUSION

The study's conclusions indicate that ecozone is popular with the locals and will create employment options because of the locators' and ISU management's collaborative efforts to meet the majority of sustainable development goals, raising the standard of living in the Province of Isabela. Efforts by the university president and other officials to construct the KIST economic zone have the potential to be successful. To help with the ecozone's design, they intend to assemble a group of specialists and submit their plan for approval to the PEZA and ISU Board. This will enhance and provide more meaning to the university's objective of being the leading research institution in the ASEAN area.

Recommendations

In order to improve SEZs at the KIST development at ISU Roxas, the author has recommended the following:

1. When hiring future employees in the ecozone, the ISU administration will establish a policy that gives preference to housing ISU graduates and residents.
2. The study strongly suggests that in order to create a sustainable development, locators who use green technologies should receive tax and rental advantages.
4. It is strongly advised to employ contemporary building techniques and select building materials suitable for a tropical nation.

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