

Applying GIS on involving public opinions for sustainable rural development

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Albeit the primary focus of Taiwan's agricultural sector has remained maximizing 'production-gains' over the past two decades, the agricultural industry underwent a paradigm shift. Sustainable agriculture agricultural development is being integrated methodically with the recreational industry, GIS can aid propaganda via promotional websites and can provide accurate travel information, it has rarely been used in these domains. A route planning map, for instance, facilitates trip-planning and is indeed a valuable asset to tourism.

Of late, a new trend in GIS is PPGIS (Public Participation GIS), wherein GIS is being employed to incorporate public opinion by involving public participation. In this study, we employ PPGIS as a tool to promote rural villages and local agriculture industry, whilst simultaneously incorporating public participation. Villagers and other interest groups are provided an interactive graphical platform with simple model components to design better landscape scenarios, thus providing a comprehensive picture to the government.

Keyword: PPGIS, Marketing Strategy, Rural Landscapes, Agriculture

I. Introduction

The impacts of of globalization have become so prevalent that even the countryside is changing under the influences of globalization. Under such changing scenarios, the agricultural operations of the 'modern countryside' are no longer restricted to conventional practices. Recently, the tourism industry has been gaining increasing attention and is considered a major source of revenue. This emergence of tourist service industry and its inevitable role in revenue generation is progressively influencing traditional agricultural production and practices.

By and large, the overall construction of countryside community used to be administered by the government. Nevertheless, the concept of "Public participation by the inhabitants" is gaining increasing momentum in the overall construction of countryside community. Its main spirit is to encourage the inhabitants of the community to participate in the public affairs to promote the quality of living. This leads to the generation of employment opportunities for the community and facilitates establishing a independent-self-dependent system of the community system. Besides, this aids the and to reconstruction of a the special or unique environment of for the community and further achieve-helps the goal realize the vision that the inhabitants are truly the best designers of the a community.

In consideration of this, the research emphasizes the viewpoints "Integrated" to carry out the development and popularization mode of village industry to be proceeded. Its In view of the above facts, this research primarily intends to major contents are integrating-integrate the information system of geography, skills of partaking information system of geography, the application of digital media marketing skills, and the advancement of related industry

achievement of village development. Such an integration facilitates the ~~so as~~ ~~to achieve the multidirectional developed realization of the~~ concept of community development through living, production, and ecology interfaces. Besides, and also to target this facilitates on the the promotion of 'green living' of the in the countryside industry. The study integrates the by integrating the marketing advancement project of special information with senses of mutual prosperity in constructions to promote the overall competitive superiority of the countryside and marketing advancements to further create increase the whole competitiveness of the leisure industry in the countryside and lead to innovativee new styles of the town and countryside development.

II. Public Participation

Integrating inhabitants' ~~When public participation is integreated with the~~ ~~and~~ resources from the government ~~and a~~ professional team with the spirit of overall construction of community evolves. ~~and starting with~~ Using the viewpoints of the local designers ~~of their hometown,~~ ~~how~~ the government departments ~~and professional team operate in coordination and~~ make the most professional and effective allocation of the resources, ~~and,~~ ~~moreover~~ Moreover, ~~how~~ the professional teams guide the inhabitants to in the process of participate in are the keys of the public participation.

A. What is "Overall Construction of Community"?

In Taiwan, "Overall Construction of Community" is no longer aan unfamiliar term. It is a project that gives priority to the inhabitants to achieve the goal of participatory local construction and establish the ~~life community of the~~ society through the coordination between the administration and enterprises. "The construction of community" means that it is through the inhabitants' continual condensation of common view and full participation in the process of projects, design and construction of hometown. This -ensures ~~so~~ that the inhabitants' community will become very comfortable, ~~healthful~~ healthy, and happy ~~and they are able to thus facilitating their~~ mutual ~~ly enjoy~~ ment of their own accomplishments. the achievements.

B. Public participation

The ~~chief~~principal spirit of ~~t~~The ‘overall construction of countryside community’ is to encourage the community inhabitants to actively participate in the public affairs to promote the quality of living. In addition, this and also creates employment opportunities ~~of employment~~ for the community, and helps setting a self-reliant to start up independent system of the community and reconstruct the special environment of the community and further achieve the goal that the inhabitants are truly the best designers of the community.

By ~~conducting~~carrying out various constructions in the community and by allowing the local inhabitants to ~~play a take~~ part in the design ~~of the construction process, the process of carrying out so as to deepen~~ the spirit of ~~the~~ community construction in imbibed in the locality and. This further enhances s the inhabitants’ belonging to the “hometown” and to ~~implant~~instills the vitality of the countryside community. Therefore, the overall construction of the community mutually integrates the thoughts of the inhabitants with the concepts of the team of professional project. ~~Its~~ The key advantages of this include:

1. Providing an opportunity for the inhabitants to express their thoughts. ~~To perform the inhabitants’ thoughts by making~~ The use of professional skills: the team ~~of professional project~~ makes use of “perspective drawing”, “schematic drawing” or “visual simulation” to ~~carry out~~ implement the ~~inhabitants~~inhabitants’ thoughts. ~~In t~~This way, countryside construction will no longer ~~be~~ remain an armchair strategy.
2. Employment of constant update methodologies in the project. ~~to seek for the most suitable project by making use of constantly amending:~~ Inhabitants are able to discuss with the team of professional project and the government departments on the drawings about the visions of their own villages and seek ~~for the most suitable project by constantly amending.~~
3. ~~To p~~Promoteing the will~~spirit~~ of providing ~~the~~ public facilities y without any compensation. Typically, for the time being, the construction lands of the countryside public facilities are mainly provided without offering any compensation fee. By communication with the inhabitants in advance about the location, ranges, and content of construction of the required lands ~~will it be possible to make the~~ the inhabitants’ willingness ~~willing~~ to provide the lands for ~~the~~ development increases. and Moreover, the use of the countryside and further ~~make the~~ construction processes can be accomplished without any difficulties and achieve the goals of promoting thus facilitating the development of

the countryside.

III. The integrated development and marketing strategies of the countryside

In the past, the designs of the construction and landscape were ~~fully the total responsible responsibility of by~~ the professional design organizations of construction ~~and~~. The inhabitants could only understand the design concept of the designers during the construction or the construction had been finished, which would often cause the following problems:

1. ~~Often,~~ the design concept of the designer ~~often~~ could not satisfy the requirements of the local inhabitants.
2. Without inhabitants' proper participation, ~~no~~ inhabitants would ~~not~~ be willing ~~or able~~ to help ~~the tasks of maintaining in the maintenance it~~ after the construction ~~was finished~~.
3. ~~For the time being the~~ The required lands required to ~~do the carry out~~ countryside construction are obtained without compensation fees which had ~~led to results of the caused~~ construction delays ~~owing to because of the~~ problems of constant coordination of the required lands.

Therefore, ~~the spirit of t the construction and design of landscapes has meant to an~~ adequate ~~discussion in advance on how to operate in~~ coordination with the inhabitants about the ~~extreme~~ requirements of construction of the local development ~~are mandatory for sustainable development. It is important and~~ to make the inhabitants fully ~~understood understand~~ the concepts and range of required lands through the display of schematic drawings. Besides, the inhabitants are able to discuss their opinions and thoughts on the drawing, so that the construction can satisfy the inhabitants' requirements and ~~have the construction be~~ finished smoothly. ~~In~~ this way, ~~a triple-win operation mode of the~~ inhabitants, ~~the~~ government and the professional team ~~all achieve success can thus be created~~.

~~The implement mode of e~~Community construction is carried out by the professional team contracted by the government organization ~~and~~. The construction and the design of landscapes are discussed by the professional team and the local inhabitants. Like SWCB, in several ~~landscape~~ constructions ~~of landscapes for example~~, we take two cases construction of an art landmark built by bricks and an image construction of entrance to state the procedure of the inhabitants' participating in the community construction:

Case one: an art landmark of village in bricks

A. The composition of project

1. In order to project the features of each village of the region, ecological rebirth and main planted fruits are presented ~~established~~ as a theme of the landmark of village.
2. The materials of the landmark of village ~~are required to must~~ conform to the landscape of the local countryside and traditional building materials of countryside are taken as the principal things.

B. The process of the inhabitants' participation

1. After ~~the public~~ discussion by the project team and the inhabitants, it was determined to adopt an art in bricks to perform the landmark of village.
2. The project team provided the cases to be references to the inhabitants, like the following drawing:



3. After ~~the public~~ discussion by the project team and the inhabitants, Chin-shui brick walls and color windows were used to perform the bricked image of an ancient countryside in accommodation with wood landmark, wood platform, wood seats and chairs to enhance both the educational and resting requirements, which were drawn in schematic drawing as follows:



4. The inhabitants chose Pattern 4 as the ~~modeling of for~~ implementation.
5. In the end, due to the factors of acquired land, five landmarks of village were constructed ~~including~~:
 - (1) Villages on hills were themed on planting peaches and the name of village and peaches were carved on the wood landmark to show the feature of the villages.
 - (2) Din-tso Villages were themed on dragonflies' rebirth and the name of villages and dragonflies were carved on the wood landmark

to show the feature of the villages.

- (3) Shan-chu-hu was themed on frogs' rebirth and the name of village and frogs were carved on the wood landmark to show the feature of the village.
- (4) Gui-Zai-tou was themed on birds' rebirth and the name of village and birds were carved on the wood landmark to show the feature of the village.
- (5) Ke-jiao was themed on firefly's rebirth and the name of village and fireflies were carved on the wood landmark to show the feature of the village. ~~After they were finished and~~ Upon completion, they were shown as following drawings:



C. Anticipated benefits

1. Being able to make the tourists catchgrasp and feel the mode of overall development of the after they upon entering this area.
2. The landmark of village shall be allowed to have both functions of ecology and industrial viewing guidance.
3. The mutual harmonizing harmony between the art in bricks and the landscape of the countryside has projected the unique style of the countryside.
4. The art in bricks has functions of mid-way break and rest.
5. The art in bricks has also functions of booths to show exhibit and sell agricultural products.

Case two: The Construction of Entrance Image

A. The composition of project

1. To design the image of the community entrance at Hua-shan Village.
2. Hua-shan Village is famous for its coffee beans and ecology, ~~which~~ This natural and cultural specialty is added into the concept of design.
3. To mold the lighting facilities at night to enhance the tourists' impressions during the night time.

B. The process of inhabitants' participation

1. After the discussion by the inhabitants and the project team, they decided to set up the spots of the entrance image at the joint entrance of Hua-shan and Kuei-lin villages. Its schematic and descriptive drawing

is shown as follow:



2. Since coffee industry and night scenes viewing are focused in this area, in order to enhance the tourists' impressions during the night time, it is more important to design the landscapes' lighting facilities to mold distinct landscapes and images of fireflies. Therefore, after the ingenious design by the project team, the schematic drawing is shown as follow:



3. The finished drawing is as follow:



C. Anticipated benefits

1. The establishment of the front appearance of the countryside community to attract more tourists.
2. The entrance image of intensifying the local tour presented by combining local natural (fireflies) and cultural (coffee industry) resources.
3. ~~The benefit is~~ increase ~~of in~~ the public facilities in consideration of day-and-night functions.
4. The ~~surrounded surrounding greenery and vegetation and beautified planting~~ are all planted by the inhabitants themselves and the

inhabitants' accomplishment increase ~~after they are finished-upon~~ completion and the follow-up tasks of maintenance and management will be easily ~~followed-carried~~ out.

IV. Practical cases

~~In recent years~~Of late, ~~the~~ government organizations have ~~not only been~~ tried-trying hard to encourage ~~the~~ public ~~to-participate~~participation in the integration of construction and the design of landscapes. Governmental agencies they have also tried to introduce GIS into the landscapes construction design in the countryside; ~~and~~ dDuring the process, ~~that~~ the government administration also intends to guided the countryside community to develop tourism industry; ~~it has also g~~Gradually, the authorities intend to employ take GIS maps as tools to elaborate and put them on sales. Each practical achievement of the application and introduction of functions are described separately as follows:

1. 2D DIY Platform of overall construction of the countryside community

In the practical cases that the professional project team and the public participated in the construction and the design of landscapes, the government organizations ~~had also~~ tried different ways to ~~conduct-get~~ more suggestions about the landscapes from the public. The case made use of the development skills of ~~partaking-participating~~ in the geographical information system. ~~Taking-t~~The famous scenic spots or regions near Yun-lin ~~literature~~ path were taken as the theme pictures to provide different landscape components on the platform so that the users could use the components to ~~increase-or-delete-themselves-on~~ modify the theme pictures. The users could add their personal suggestions and ideas to the theme pictures themselves. The design with characteristic landscapes and the finished works could be directly displayed on the website to express the users' suggestions on the landscapes ~~of that region~~ and their works could also be provided as references to the 'The overall construction of countryside community' project-by-the-the government organizations.

In the future, the platform shall try to conduct GIS to proceed analysis and display about the public's ideas and suggestion on the landscapes of the countryside.



Fig. 1 2D Overall Construction of Countryside Community DIY Platform Screens

2. Website of fancy views of the countryside

The research shall integrate on the website all the information of regional scenic spots, lodging, tours, and agricultural specialties to ~~profoundly introduce the village landscapes and~~ offer the users with a ~~plaform-platform~~ with functions of interaction and communication to recommend itineraries and lodging. In recent years, ~~T~~he Soil and Water Conservation Bureau, Council of Agriculture, Executive Yuan has ~~kept~~ guided and assisted the villages and towns and communities to carry out ~~overall project~~ construction ~~projects~~ and individually develop their ~~reginal-regional~~ features ~~and has considerable accomplishments~~. In order to promote the countryside industries through virtual information platform and ~~firtual-virtual~~ community set-up and enhance the effects of development, it shall display the integration of the community with the local features on the information of the website so as to propagandize the bureau's advancing the constructions of the countryside and promoting the achievements of the relative industry in the countryside so as to achieve the goal of learning while entertaining.



Fig. 2 Function screens of the website of fancy views of the countryside

3. The beauty of Hua-shan coffee in rural villages

A. Website marketing

The website of the beauty of Hua-shan coffee in rural villages has integrated the information of scenic spots, hiking paths, culture, ecology and agricultural specialties, etc. in the wide Hua-shan areas to profoundly introduce the leisure industries of the countryside and provide the public to download related published and written information of tourism. After the ~~wide Hua-shan areas had suffered from~~ 921 disaster of earthquake, under the continual and progressive reconstruction and guidance by both the central and local government organizations, the industries in the countryside ~~of that areas have been were~~ promoted and ~~led to the development of~~ leisure industries ~~developed and also have with~~ outstanding results. Now, the wide Hua-shan areas have become the most popular 2-weekend-day leisure spots of the public!



Fig. 3 The website of the beauty of Hua-shan coffee rural villages



Fig. 3 Map of hiking paths



Fig. 4 E-maps

B. Technical description of E-maps

The website ~~has is~~ integrated with E-maps to display the scenic spots and hiking paths of the countryside by ways of e-maps. ~~Hereunder t~~The technical brief description of E-maps is stated as follow:

1. The Web-GIS technique analysis

~~In order to Integrating combine with~~ the original GIS technique and internet, ~~with the~~ Web GIS technique ~~has to emerged with~~ all kinds of GIS functions ~~and capabilities~~. ~~In regard to the Web-GIS technique level~~According to that architecture, it will be divided into the Client and the Map Server ~~to carry the explanation~~ as follows:

(1) The Client

Web-GIS out-putting the sketch of going to the web page can be divided into the image format (ex. png , gif, jpg) and the vector format (ex. swf , svg, gml, sdf), currently, the vector format needs a plug-in compatible in the web page, however, the advantage is that the little file amount, the GIS data download to the Client not need to

repeat download from the server, it also will not have the problem of drawing the quality loses really, this kind of development technique mostly has the FLASH, Map-Guide, Java Applet, the ActiveX Control etc. technique development. And the image format then can design the higher sketch beauty degree, for example, the set folds the geography diagram, the aviation photograph or the satellite image, the file format is pure, can apply the DHTML technique development, did not need the plug-in problem, also can combine the FLASH to increase the web page interaction.

(2) The Map Server

Map Server main with the GIS manufacturer software develops, mostly through CGI or Server API (as Microsoft ISAPI, Netscape NSAPI) method, allow the users through the web page instruction to start the program exist in the web page server host, however, this kind of method usually needs to be depended on the particular WEB server, it can transplant worsen. Meanwhile applying this kind of method, when the network discharge is higher, the system reaction will become slowly, it can't attain the loading balance of the single host effectively.

This system use the concept of designing the sample product, apply the DCOM/ActiveX standard, construct the Web-GIS scatter the type article structure, it's biggest advantage to promote the significantly speed, also can carry on the mechanism of the load balance effectively. Meanwhile, it can depend on the different GIS data format or function, change the map component, it can look after both sides of the biggest flexibility, save the two times development of the software.

2. The system technique development explains

This system makes use of the website editor development tool, Microsoft FrontPage 2000, Dream weaver 2004 MX, combined with the DHTML, JavaScript, ASP etc. ~~The internet-development technique in the head diagram usage the interface (Web-Viewer) develops, also using~~ uses Microsoft Visual Basic 6.0 development tool to carry out carries on ~~the~~ COM/COM+, ActiveX Control etc. in the development of the software component, ~~again w~~ With COM/COM+, the ActiveX Control software

component carries the Web-GIS the map service. ~~The~~ ~~the server after~~ ~~adopting configure with the Windows DNA dispersion type software and~~ ~~the dispersion the type software component the development the mode~~ ~~take into integration to develop, however at develop in the process have~~ ~~ever suffered the Application after carry with the Web head the interface~~ ~~integrated with some technique bottlenecks, through design the sample~~ ~~product~~ can resolve the interface integration and the space data format commutation problem in front and back, ~~succeed make~~. ~~The~~ traditional GIS file(as Shape file, coverage, etc.) can ~~be accesses to~~ integrated with ~~the set to fold with~~ the space spatial ~~database meanwhile whilst,~~ ~~overcome overcoming with the old GIS system space data~~ compatibility problem, validly thus ~~improvinge~~ the efficiency ~~of the access~~ space data access.

~~By head diagram set The~~ Web-Viewer provides the ~~operation~~ search operational interface with considerable of an intuition, ~~simplification, the~~ ~~convenience type, with through behind carry.~~ ~~†~~The Web-GIS map service server, combines together the ~~technique and internet of the~~ electronic map, and reads directly the ~~meta-~~ data directly, searching the result. Finally, and ~~the electronics map~~ image are images are directly linked to present the demonstration on the internet.

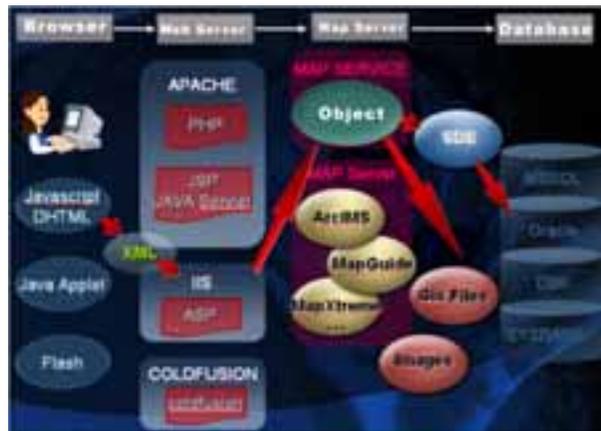


Fig. 4 A composition of Web-GIS system

V. Conclusion

During the development of the agriculture in the villages in our country, the problems ~~we are confronting with are confronted are~~ no longer simple ~~ones in the agriculture~~. It is essential ~~for us~~ to integrate wider issues in

economy, society, environment and system. Starting from the feature of local culture in local villages, we should elaborate the potential priority as well as carry out the review and project of the related regulations of the system. ~~This facilitates to setting up superior villages that are comfortable, harmonious, secured, innovative, wealthy and wealthy and of both functions in production & living and ecology.~~

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The development of agriculture, the construction of the countryside and ~~taking care the welfare~~ of the farmers are ~~one of the~~ important governing goals of the government. In order to ~~create new vitality of the countryside and expectation of vitalize the countryside, achieve these goalds,~~ the management of industries should be further modernized and ~~business-~~ managed ~~professinoally~~. On the other hand, the Bureau has progressively advanced the tasks of the overall construction of countryside community. Besides constructing exquisite environments, the most important thing is nothing more than on “Humans”. Environments are regarded as hardware and humans are software as well as soul. The whole community can be activated by every one of us to do it ourselves to improve the hardware of the environments and to promote the software of “humans”. ~~Through By~~ encouraging ~~the community inhabitants’ participation and condensing the community senses,~~ the ~~Bureau administration~~ has ~~encouraged the inhabitants to actively participate in the public affairs, revived the create the~~ vitality of the community ~~and,~~ decreased the unemployment problems in the countryside during the period of reconstruction. ~~Above all, these efforts have and recover~~ ~~ed and re-instilled~~ ~~the living~~ confidence of the inhabitants ~~living~~.

With the ~~domestic~~ development of the overall construction of countryside community, we are looking forward to integrating the community inhabitants’ participation, condensing the community senses, constructing the community characteristics, enhancing the improvement of the environments, promoting overall quality of living and being self-supporting so that ~~every each~~ countryside ~~is able to possess has a its unique~~ ~~characteristic~~ styles. In ~~the~~ future, under the mutual competition and integration among the communities, ~~boundless energies in the locals can be well displayed so as~~ ~~unlimited pool of energy and resources can be used~~ to achieve the goal of continual development in the countryside.

VI. References

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