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Spatial Planning and Traditional Culture Based Urban Acupuncture Concept On Upgrading Low Carbon Tourism Village

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Abstract*: The Sruni has been declared as a tourism village since 2011. The village is rich in cultural diversity, strong community participation and beautiful scenery of paddy field, mountains and river. This paper identified the urban acupuncture concept on spatial context and traditional culture in the improvement process to become low carbon tourism village. The methods used covering interview, field observation, Focus Group Discussion and ended with implementing the concept in design. The results showed that the demands on promoting the village as tourism object was very strong and housing re-densification could reduce the carbondioxide concentration as much as 43,439%.

***Keywords* : urban acupuncture, spatial planning, cultural diversity, low carbon tourism**

I. INTRODUCTION

As the Sruni village in Wonosobo has been declared as a tourism village based on the Spatial Planning Management Regulation of Wonosobo Regency year 2011 – 2031, it gradually becomes very famous due to the richness of culture, beautiful natural scenery, traditional housings possible to be home stays, art, ritual event, traditional dances and music. The promotion of the cultural wealth of the *Sruni* village could not be separable from the role of *Dieng* Creative Hub (DCH), a public facility that often organizes and performs traditional art events of the village as well as accommodates other communal activities such as sports and focus group discussions (FGDs) to develop the *Sruni* village as tourism object. Furthermore, the *Sruni* has not only cultural diversity but also natural resources which are very abundance and need to be altered and recycled as daily energy regarding a low carbon energy concept that is very beneficial for the inhabitants.

Since the Indonesian Government launched the program of City without Slum (CWS) to eradicate slum in Indonesian cities, the *Wonosobo* regency government developed many programs to alleviate poverty and slum in its villages and kampongs, the Indonesian terminology of villages located near the city central business district. Becoming the centre of Java Island in Indonesia, the *Wonosobo* Regency surrounded by volcanic mountains, *Sindoro*, *Sumbing* and *Prau* mounts, in which the region has such beautiful spectacular mountainous scenery. Having topography condition in the range of 275 - 2,250 above sea level, the *Wonosobo* has a comfortable climate with an average daily temperature of 23-27ºC per year, yet it has a very high rainfall of 2,300 mm in a year with at least 65% rainy days every year. The regency is bordered in the north by the *Temanggung* Regency, in the west by the *Banjarnegara* Regency, in the south by the *Purworejo* and *Kebumen* Regency and in the east by the Magelang Regency. The location of the Regency and Sruni village are described in Fig. 1, while the climatology data are depicted in Table I.

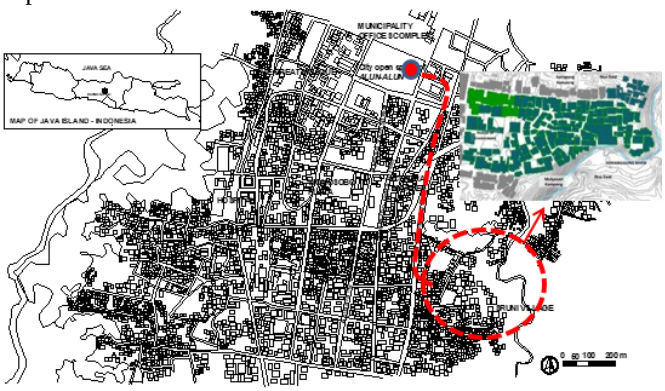

Fig. 1. Map of Java Island, Wonosobo city, and location of the Sruni village

The centre of the Wonosobo city is the open public space, '*alun-alun'*, a traditional centre square, is in red point located in the heart of the city (see Fig. 1). On the direction to the Sruni village, ones must be move along the Kyai Muntang street in the eastern part of the city in south direction. The Sruni village is located in urban periphery with still has a huge paddy fields, surrounded by mountainous scenery and bordered by the famous Semanggung river in the east (see Fig. 1).

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Due to its geographical site and location, this village has comfortable climate refer to the Wonosobo climatological data (see Table I)

Table- I: Climatological Data of Wonosobo city

Temperature and rainfall	Jan	Feb	Marc	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Average Temp. (°C)	22.0	22.1	22.4	22.5	22.8	22.3	21.8	22.0	22.4	22.9	22.4	21.8
Min.Temp. (°C)	18.0	18.0	18.2	18.3	18.5	17.5	16.7	16.7	17.3	18.1	18.1	17.7
Max.Temp. (°C)	26.0	26.2	26.6	26.8	27.1	27.1	26.9	27.3	27.5	27.7	26.8	26.0
Rainfall (mm)	359	448	346	513	217	254	29	20	9	457	655	373
Days of rain (days)	25	25	24	25	15	19	8	10	12	21	26	20

The Table I reveal that the city has a unique climate with average temperature between 16.7°C-27.7°C, such a lower temperature compared to other cities in central Jaca province. By these climatological and geographical data, it is very logical that there are still many rice fields on the border of the city and it looks really sub-urban.

Urban acupuncture concept in urban design

Studies about urban acupuncture to upgrade region, cities and villages have been conducted by a number of researchers [1]–[4]. As stated by Harjoko that the urban acupuncture was the analogical terminology adopted from the human body system as healing process concerning human vital organs including lung, liver, kidney, heart system, large and small intestine system. It was a pinpoint approaches to upgrade the kampung either in the heart of the city or in the periphery region [1]. In the study, Harjoko revealed that the urban acupuncture covers transport system, urban parks and greeneries, affordable housings for the poor and recycling system. In the conclusion, it was found out that the urban acupuncture generates activities and sectors in urban that suitably causes the city or village functioning enlivens in a broader meanings. Like the study conducted by Harjoko, reviews of urban studies undertaken by Lerner and Brown discussed transforming the city through the urban acupuncture concepts [3], [4]. The studies properly identified the concept on the city, but the implementation on how the housing for the poor could be applied and how the social context concerning the cultural diversity could be integrated had not been discussed comprehensively. Unlike those studies concerning the concept of urban acupuncture, Houghton et al. wrote their experience on how to enliven the Brisbane city to be a city that has activities, recreational facilities and cultural as well as social events and festivals. The approaches used in their method were implementing social and technological networked interactions. Finding in their research identified key elements were needed to arrange the public spaces using the social and technological networks. A new wave of communication, interaction and interdisciplinary connections were proven to be part of the stimulus to enliven the city of Bribane through UR [BNE][2]. The UR [BNE] is a social network application technology which could bring online communication and dialogue between planners, designers and communities. With this communication, the city of Brisbane gets bottom up input and output so that planners and designers could follow up with the design and the local government then could follow up by realizing the design for the benefit of the community [2]. Although it comprehensively discussed the way how the social and technological networked system could be applied, yet it did not revealed the spatial context of urban acupuncture implementation.

Slum region as a tourism object development

As the urban acupuncture is closely related to the upgrading bad conditions of the cities and villages, many studies discussed the slum tourism in correlated with the tourism development [5]–[11]. Continuing on the discussion of tourism development policy, the Indonesian government through the Wonosobo regency has had policy on developing the slum village having cultural diversity as a tourism object like the Sruni village [12]. A research conducted by Martins et. al, highlighted that the Portuguese tourism organization has developed a virtual multisensor experience method to promote thematic tours of a port wine tourism in the Douro valley, Portuguese [5]. This application model with a virtual multisensor experience method has proven feasibly and can be implemented in promoting thematic tourism in the Douro wine port tourism. Although the research succeeded in finding promotional applications that could be applied to accelerate the tourism sector around the world, the research did not discuss spatially how the wine port tourism was planned, designed and supported by local government policies [5]. On the other hand, research by Zhao and Ritchie implied that the development in a tourism-based approach to poverty alleviation has developed nowadays. The United Nations World Tourism Organization (UNWTO) has prioritized poverty eradication in the past decade with the concept of ST-EP stands for Sustainable Tourism as an effective tool for Eliminating Poverty [6]. Since tourism academicians ignored the alleviation of poverty, studies were then split and only limited to the scope of discussion while on the methodological side, they did not have a consistent direction. Zhao and Ritchie discussed an integrative research framework, which synthesizes various perspectives and could be used as a comprehensive guideline to stimulate and lead other future questions about tourism and poverty alleviation [6].

Furthermore, possible further studies were recommended appropriately in the conclusions section. Similar study has been developed by Chok et. al., which discussed tourism development method in the developing country using the concept of PPT which is abbreviation of Pro Poor Tourism [7]. The developing countries governments have also changed their policies to the sustainable tourism development to eradicate poverty in their countries. This tourism development model takes eco-tourism theme and encourages community participation[7]. Similar strategies and policies have been implemented refer to studies conducted by Harrison and Schipani [8] and Zapata et.al [13].

On their research, Zapata, et. al. explored the implementation of CBT (Community Based Tourism) program by using the impact analysis of CBT networks and life cycle [13]. The CBT was applied to accelerate socio-economic development and poverty alleviation. The results of the study concluded that up-streamed CBT was more effective than the down-streamed CBT on three things covering local initiatives, longer life expectancy and faster local economic growth. Several studies analyzed the development of tourism in poverty and slums carried out by Zhao and Ritchie [6], Chok, S et.al., [7], Harrison [14], Goodwin [15], Harrison and Schipani [8] and they conclusively concluded that CBT had a close synergy with the Pro-Poor Tourism (PPT) which aimed to make the community as a center for the development of tourism development that accelerated the local economy, reduced poverty and accelerated local capital investment by promoting cultural diversity, products and local festivals.

Tourism village as government policy on tourism development

Since many cities in the world develop and trigger tourism village and tourism cities, a number of studies discussed the tourism development and concepts regarding the tourism cities and village [15]–[20]. Every tourism village needs community participation to promote its advantages. While the community participation become the most important variable on accelerating tourism development, a number of studies highlighted rural or village on tourism development supported by the local government[19]–[21]. The Russian government policy helped depopulation of village due to its poverty living condition by improving the poor way of life[20], while Lin, et al., investigated a village having water conservation advantage and collected questionairs from various stakeholders to conclude opinions regarding factors influencing the tourism development such as product features, village cohesion, tourism image, ecological damage, infrastructure and service quality.

II. MATERIAL AND METHODS

Refer to those references and potential review of the village, this research had six approaches and techniques to obtain field data consists of interviewing the inhabitants and government sector, spatial content, traditional housings, information consist of demography, fuel used by the inhabitants, sites topography, natural potential and scenery, traditional events and traditional food as well as home industries and traditional craftmanship. The method consists of three steps to obtain results covering the urban acupuncture concept in Sruni village. The urban acupuncture concept was disseminated based on the spatial context and cultural diversity in the village. The first step were interviewing and elaborating the raw data regarding cultural activities, inhabitants needs on public space, accessibility, circulation, potential traditional housings for homestay and possibilities of re-densification to reduce density and to create new public open space as well as to enhance the value of low carbon concept in the village. In this step, researchers also concerned about adjusting of building floor area ratio and providing greeneries.

An initial research became a reference to describe carbondioxide concentration reduction in the village using the equation embedded the description on how the concept could be implemented to reduce the carbondioxide emision. The low carbon emission calculation covered Primary Carbon Footprint (PCF), Secondary Carbon Footprint (SCF) and Material Carbon Footprint (MCF)[22], [23]. Furthermore, the second step was determining the urban catalyst to accelerate and upgrade the village for better future in correlated with tourism development and spatial aspects. Finally, in the third step, this research developed and implemented the urban acupuncture concept which fulfilled the inhabitants demands by presenting the concept to the inhabitants in the Final Design Presentation in the *Dieng* Creative Hub, a public facility usually used as a community centre in the Sruni village and has an important role to develop the Sruni village as tourism village.

III. RESULT AND DISCUSSION

As mentioned on studies, the concept of urban acupuncture covers accessibility, circulation, housings, open space, flagship buildings, festival market and renewable waste [1], [24]. Based on this current research theme on spatial context, low carbon village and cultural diversity, this study focused on the spatial concept based cultural activities in Sruni Village on the framework to develop the village as tourism destination. The concept of urban acupuncture in Sruni village consists of cultural and social activities, accessibility and circulation, green open space concept, traditional housings as homestays and flagship buildings as urban catalyst for the Sruni village. The cultural and social activities in Sruni village are strongly associated with the role of flagship buildings of House of Environment (HoE) and the *Dieng* Creative Hub (DCH).

The Table II shows the cultural and social activities which is regularly conducted by Srunis inhabitants and their frequencies. Besides the HoE, the role of the *Dieng* Creative Hub (DCH) could not be ignored in supporting and empowering the village tourism development. Anciently used as old cinema, the DCH was renovated in 2015, as a result of interview, and has been used as communal activities buildings for couples of years.

Table- II: The variety of social and cultural activities in Sruni village

Activities type	Kinds of activities	Doer	Activities Frequency	Visual photograph
Larung Sukerto	Festival	Inhabitants	Once a year	
Cultural Art performance	*Bundengan*, *lengger* dance, *kuda lumping* dance	Inhabitants, government, tourists	Tentative, often performed	
International design competition	International workshop	Inhabitants, academicians, government	Once in April 2018	
Home industries (Local economic development)	*Carica*, traditional mask, cookies, Fishing, farming	inhabitants	everyday	
Independence Day Celebration	people party and competitions	Inhabitants, government	Once a year	
Sports	*Futsal*, badminton, volley	Inhabitants, local participants	everyday	
Pigeon Race	Pigeon race	inhabitants	Tentative, often performed	
Friday Prayer	prayer	inhabitants	Every Friday	

Fig. 2. (a) An Old Cinema in Sruni village; (b) The old cinema to a new apperarance of Dieng Creative Hub abbreviated as DHC and (c) sport activities; (d) Under constructed House of Environment; (e) Sruni village map

The Fig. 2(a,b) shows the Dieng Creative Hub in old and new appearances respectively with sport activities inside the building, see Fig. 2(c), while Fig. 2(d) illustrates under constructed House of Environment (HoE). To make clearer the description, the Fig. 2(e) shows the map keyplan of Sruni village completed with the location of the *Dieng* Creative Hub (DHC) and the House of Environment. Becoming flagship buildings of the urban acupuncture concept of Sruni village, the HoE and the DHC have appropriate role to promote the village due their front location and activities held in the buildings. On the role of the tourism development, the traditional art, dances, festival and musics in the village have possitive impact to accelerate the development. The role is in line with the research conducted by Rolfes [25] in which poverty became an object of tourism and a number of studies that discussed about the Community Based Tourism (CBT) and their activities, event, culinaries and culture to regenerate the tourism development [26]–[28].

Based on the Table II, the traditional and social activities need spatial consequencies and spatial mapping. For example, the '*larung sukerto*', a ritual and festival on village held annually (see Fig. 3), is becoming the most popular traditional festival, on which inhabitants walk around the sub district, bring their heirlooms and wash them in the very famoust Semanggung river in the eastern part of the Wonosobo city (see Fig. 3). This festival is held every 1 Muharram based on the Islamic or Javanese calendar.

(a) (b)

Fig. 3. (a) (b) the cortege of '*larung sukerto*'

Hopping along the year they could be blessed with prosperity, lucky, healthy, success and godspeed with their jobs and business, they start in the early night until midnight with traditional music of '*bundengan*', *lengger* dance, traditional mask dance as well as '*kuda lumping*' dance which are performed in the DHC or in the HoE. The Fig. 3 shows the activities and traditional ritual of '*larung sukerto'* in the village (see Fig. 3a,b).

Continuing on the discussion about the traditional music, the most popular music in Wonosobo is '*bundengan*' music. In the past before the existence of an umbrella, '*kowangan'* is a duck shepherd hat which has function as a means of sheltering from the hot sunny days or rain when herding ducks in the rice fields. Sometimes, on the inside of the *kowangan* is fitted with a palm rope so that it functions as a musical instrument to accompany *shalawatan*, a traditional islamic prayer song. The duck shepherd hat or *kowangan* is familiarly called '*bundengan*' when it is used as traditional music instrument. The *bundengan* or *kowangan* is made of selected skin of bamboo *Apus* (a local bambo species of *Giganthochloa apus Kurz*). This *bundengan* produces a sound that is similar to a number of traditional musical instruments in the form of a small ancestral drum or bem sound (the sound of a large drum resembling a bass drum on a conventional '*keroncong'* instrument). To play the bundengan is by picking it like a guitar or fiddle.

(a) *(b)*

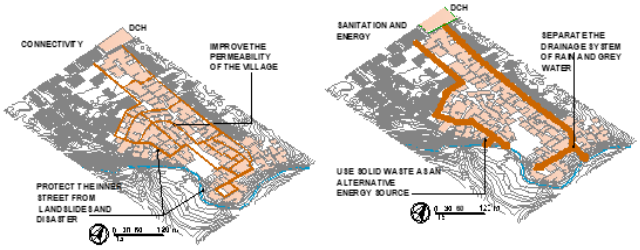
Fig. 4. (a) a traditional dance of '*kuda lumping*'; (b) lengger dance

The Fig. 4 (a,b) illustrates the art performances of '*kuda lumping'* and '*lengger'* dance respectively which are supported with the Bundengan traditional music and often held in the DCH (Dieng Creative Hub, a communal building) and House of Environment buildings.

By focusing on the spatial context in correlated with the urban acupuncture concept, the Sruni village is designated refer to those socio-cultural activities. Revealed by Harjoko study that the urban acupuncture concept was extracted consisting accessibility, greenery, re-housing, and waste management[1], while Shidan and Qian stated through their study that the concept should be arranged covering public space, flagship buildings and festival market[24], consequently, this present research is going to combine those concepts on term to determine the concept based on spatial planning and cultural diversity. For this purposes, the discussion will be separated into several sub headings consisting accessibility and circulation, open spaces concept, re-densification and low carbon concept, traditional housings as homestays and the future House of Environment as both flagship building and urban catalysts in the sruni village.

(1) Accessibility and Circulation

As stated by Shidan and Qian that the accessibility and circulation are important in the urban acupuncture concept [24], those aspects could be arranged in the Sruni village. The village has a steep topography from north to south of the site. Meanwhile, the main road in the middle of the village has an inadequate width, so that services access cannot reach parts of the village on its southern side. Therefore primary access needs to be widened, while secondary access in front of the House of Environment needs to be revitalized as an inner secondary road. Many pathways in the inner parts of village as tertiary access that connects the main access and secondary access should be upgrade due to their slipperiness. The pattern of connectivity and circulation are illustrated by Fig. 5 (a), while the sanitation and drainage system as unitary parts of the streets and pathways are depicted by Fig. 5 (b).



(a) (b)

Fig. 5. (a) Connectivity, accessibility and circulation; (b) Solid waste and drainage system

In connection with the large number of rainwater sources in Wonosobo city, the application of the rain harvesting system must be implemented in the concept of sustainability in an independent manner towards reducing the dependence of water supplies from the Clean-Drinkable Water Supply Company (*PDAM)*.

(2) Open space concept

Another important term besides circulation is availability of public open spaces [1], [24]. Related to cultural events and activities held by inhabitants, the pattern and concept of open spaces are arranged in which they are connected and integrated between ritual activities and circulation.

The Fig. 6 shows the continuous green dashed line connecting the village open spaces in orange circles each other as a map of inhabitants acitivities described in Table II previously.

As stated in the study conducted by Shidan and Qian, the urban acupuncture concept needs open spaces to accelerate urban tourism development [24]. The Fig. 7 shows the urban acupuncture concept on open spaces planning and activities based on cultural diversity in the Sruni village. To promote the village as a tourism object in Wonosobo, a tourism centre should be established in the House of Environment (see Fig. 7.b), while to hold traditional event, dances and music, the inhabitant should have another open space besides that in HoE in front of RT #5. The definition of *RT* stands for *Rukun Tetangga* is a smallest unit of village or group of 30-100 households depend on the size area of village or kampong [29], [30].

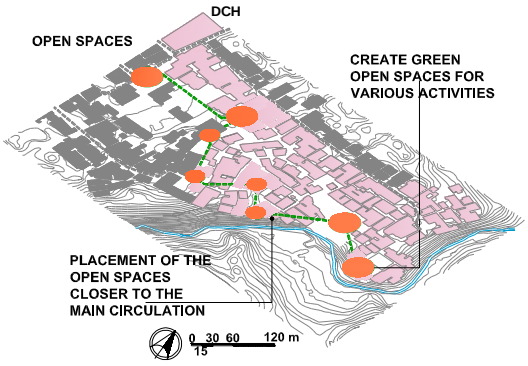


Fig. 6. Open spaces concept in the Sruni village

Fig. 6 illustrates the public square and open spaces proposed in the Sruni village, Wonosobo. Similar to the previous research conducted in the kampong Pakuncen in Yogyakarta, the proposed open spaces aims to reduce densification in the village[31]. The green open spaces can enhance oxygen content and make the atmosphere healthier. Furthermore the green open spaces can support tourism goals for the village having uniqness stone and wooden housings for homestays. Refer to research conducted by Hermawan et al., the housings in Dieng plateau and Wonosobo have uniqness related to materials and adaptation to cold climate in these regions[32], [33]. The concept of homestay is strengthened on the traditional and uniqness typology of the housings. The open spaces which have been proposed in this current research is not only to support the tourism concept but also to maintain the comfortable climate in the village.

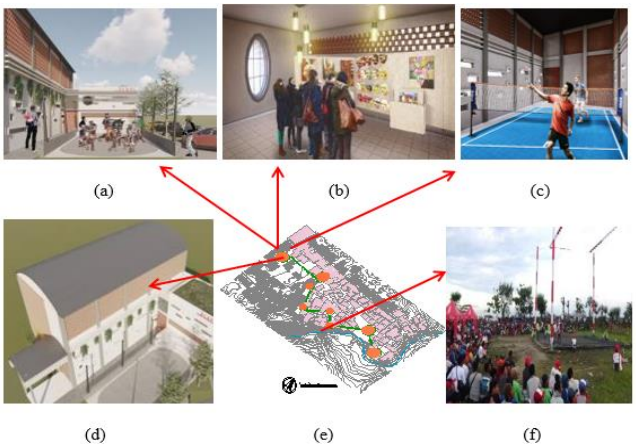


Fig. 7. (a-c) Activities in HoE (d) House of Environment (HoE); (e) key map (f) Pigeon Race in open space; (g) Open space in RT 13, river and paddy field

RT # 13 should have another open space (see Fig. **6**). With paddy fields, the Semaggung river and mountainous scenery surrounding the RT#13 open space. Furthermore, the beautiful sceneries in several points of the village could be displayed amazingly.

(3) Re-densification and Low Carbon concept

As conducted in previous research, re-densification in village or kampong became an important role to improve settlement in urban space[31]. Housings in the Sruni village could be catagorized as a middle densely populated settlement, but the housing quality should be upgraded to be better and more comfortable. Many traditional unique house could be utilized as homestays. As a results, to maintain ground floor area ratio and to create more green open spaces, it needs housing verticalization and re-densification concept on the village.

Table- III: The difference of carbon footprint before and after re-densification

Carbondioxide Concentration - Existing Condition of Sruni village									
Houses	**PCF (T)**	**Sub total**	**SCF (T)**	**Sub total**	**MCF/ sqm (T)**	**Floor area (sqm)**	**Total MCF (T)**	**Sub Total CF (T)**	**TOTAL CF (T)**
117	0.010	1.170	0.2637*	0.8529	0.0961**	21.150,900	2.032,602	2.064,625	2.294,080
13	0.014	0.182	0.2637*	3.4281	0.0961**	2.350,100	225.845	229.455	
Carbondioxide Concentration - Planning of Sruni village									
Houses	**PCF (T)**	**Sub total**	**SCF (T)**	**Sub total**	**MCF/ sqm (T)**	**Floor area (sqm)**	**Total MCF (T)**	**Sub Total CF (T)**	**TOTAL CF (T)**
117	0.010	1.170	0.2637*	0.8529	0.0961**	15.372,900	1,085.971	1,117.994	1.285,752
13	0.014	0.182	0.2637*	0.4281	0.0961**	1.708,100	164.148	167.758	
The Difference of the carbondioxide concentration (carbon footprint) between exixting and planning									1.008,328

Reduction Percentage of Carbondioxide concentration of Sruni village	**43.439%**

Table III reveals that by vertical housing concept and re-densification, the carbondioxide concentartion could be reduce as much as 43.439% due to the increment of public green open spaces which could be created after the housing verticalization. On consequencies of this arrangement, the carbon footprint calculations on the table represents reduction of the carbondioxide concentration in the village. Still refer to the Table III, the total ground floor area before and after verticalization are 23,501 sqm and 17,081 sqm respectively. The difference of the total ground floor area is basic to calculate the reduction of the total carbondioxide concentration in the village representing the low carbon concept (see Table III).

The concept of housing verticalization in the Sruni village was based on the standard from the Ministry of Public Work and people housing of Indonesia, that the member of family is approximately 4 people. The vertical housing concept is implemented with the aim of creating more public open spaces in the village. The vertical housing is not only a solution to make the village more sustainable with green open spaces, it is also a smart way to utilize crust waste of geothermal energy appears abundantly from *Sikidang* crater located at least 29 km from the village to the north direction. As the previous research observing influences silica in baggase ash to increase compressive strength in concrete[34], [35], the geothermal silica is appropriately used in concrete wall panel for the vertical housing in the Sruni. With the potential of geothermal silica waste in Sikidang crater, the geothermal concrete wall panel can be implemented for the establishment of vertical cubicon-modular houses in the Sruni village. Actually having 10 RTs, this village parameter has 4 RTs (*Rukun Tetangga*) covering RT #5, RT #7, RT #8 and RT #13. Refer to the urban acupuncture that urban renewal is developed in several points in the village to accelerate upgrading of the village[3], [24].

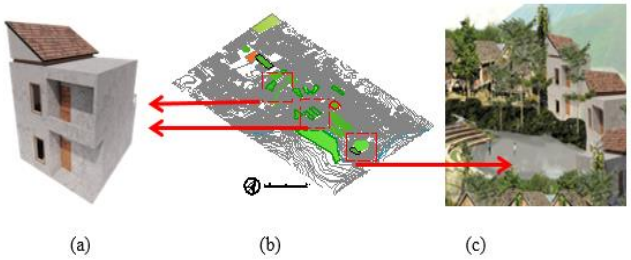


Fig. 8. The concept of vertical housing (VH) made of crust waste of geothermal silica from Sikidang crater, 29 km from Wonosobo city (a). VH in RT #5 and RT #8; (b) key map; (c) VH in RT #13.

By this point of view, the vertical housing models are arranged in three points of the village space to regenerate other spaces for being better and more sustainable in the future (see Fig. 8). This urban renewal concept in the frame of the urban acupuncture agrees with the study conducted by Shidan and Qian which analogoused the several urban renewal points as acupunctural treatments in human body to regenerate the whole metabolism[24]. As stated in research conducted by Harjoko, that efforts of upgrading housing is one of several efforts on implementing the urban acupuncture concept[1].

(4) Traditional housings as homestays, flagship buildings and local economic development

Similar to previous study of housing in the Dieng plateau and its surroundings[32], [33], the Sruni village has many traditional houses that have unique shapes. A number of unique traditional houses are potentially used as homestays. Meanwhile, local economic development concept is applied based on the potential that exists in the Sruni village. The local economic potential consists of traditional mask home industries, *carica* (sugar water fermented of little local *Dieng* papaya on the species of *Vasconcellea cundinamarcencis*), many stalls or small shops, cookies and cake home industry, fishing ponds, paddy field farming and cattle farm. There are three most important buildings that support the urban acupuncture concept to the village. Firstly, the DHC and House of Environment in the front gate of the village have an important role to promote cultural diversity and tourism due to their activities and events. Secondly, there are many traditional house that could be utilized to be homestays. Instead, the owners of traditional houses are relocated to vertical housings build by the Wonosobo government to regenerate tourism development and to invite more tourists visiting the village. Various kinds of home industries and potential local economic in the village could accelerate tourism, while the concept of renovating the traditional house to become a homestay is illustrated on the Fig. 10 on the next page.

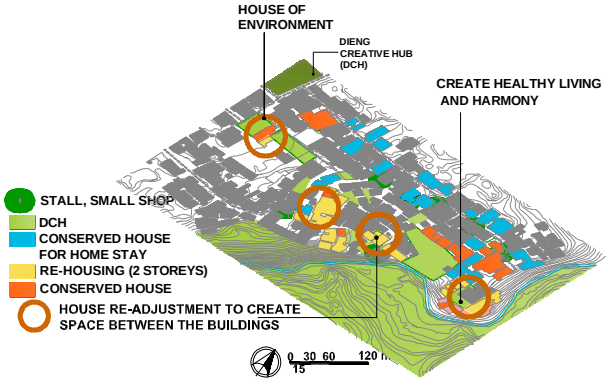


Fig. 9. Local economic development in the Sruni village

Fig. 9 describes the local economic development in the Sruni village. The figure is in correlated with the potential local economic of the village that might be considerated on the spatial planning of the urban acupunctural concept. Regarding to the home industries, the location of home industries is relatively closed to the main street in the centre of the village. Furthermore, the sub-urban character of the paddy fields, Semanggung river, fishing ponds and cattle farm have supported the village since decades ago. Besides those potential aspects, there are several traditional art, musics and dances that have also contributed to the uniqness of the village as tourism objects.

The spatial planning described in the previous explanations has been arranged to support the concept of urban acupunture that must have been implemented for the better Sruni village for sustainability with its cultural diversity.

(a)

(b)

Fig. 10. (a) Existing and renovated plan; (b) visual elevation of traditional house

For upgrading housing concept, the Fig. 10 illustrates how the existing traditional house might be renovated and utilized as a homestay (Fig. 10 a). Previously having only two bedrooms, the homestays could have three bedrooms with toilet each after a little renovation with open terrace facing to the beautiful mountains and paddy fields scenery to the southern side of the village (see Fig. 10 b). This effort supports the results of the previous research that the wooden housings in the highland give comfortable climate[32], [33] and should be conserved as unique houses that tourists much more prefer to live in.

IV. CONCLUSION

This study aims to establish the concept of urban acupuncture in a tourist village based on the pattern of spatial planning and cultural diversity in the Sruni village. As concluded in several studies that circulation and connectivity, availability of green public open spaces, sustainable self aided housing, and sustainability on recycling waste are mandatory on upgrading urban spaces[1], [24], [36], [37], therefore the village of Sruni should be upgraded on supporting the Wonosobo city as tourism destination. On term of the effort to village more sustainable, re-densification and vertical housing concepts should be implemented to create more green open spaces for the inhabitants. Consequently, the difference of ground floor area ratio of befor and after re-densification must be calculated and multiplied in PCF (Primary Carbon footprint), SCF (Secondary Carbon footprint) and MCF (Material Carbon footprint) equations. As a results from their differences, this present studies found out that the carbon footprint of the village can be reduced as much as 43.439%. By this findings, it can be concluded that the spatial planning on the frame of urban acupunctural concept has positive impacts to sustain the Sruni tourism village.

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