Transformation of metropolitan suburban area (a study on new town development in Moncongloe-Pattalassang Metropolitan Maminasata)

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Abstract. This study aims at examining and analyzing the transformation of new town development in spatial perspective of a metropolitan city. The complexity of the new town development causes morphological diversity and progresses toward the integration of urban system of Maminasata Metropolitan. This research was a case study using a qualitative and quantitative approach. The data was obtained through observations, surveys, and documentation. The results of the study showed that the physical transformation in the new town development characterized by the presence of social, economic functions and the support of road network construction caused increasing flow distribution of goods and services, labor migration and social mobility vertically and horizontally as well. Increasing urban activity ran parallel with the position of developing new town as the economic growth pole. New town development spatially becomes the driving force of change in social structure, social mobility and changes in cultural patterns of the local community. Different ability in the adaptation process of function of evolving space, and imbalance in the control of reproduction of space in a new town provides impacts on marginalization and poverty in the urban local communities.

Keywords: New Town Transformation; Suburbs; Land Use Conversion.

1. Introduction
Metropolitan suburban areas developed as new towns in Indonesia physically, economically, and socially have a tendency toward complexity utilization of space based on functions of activity that is growing. Giyarsih states that there are three factors that led to the growth of suburbs; (a) improving city transportation services, (b) urbanization and migration, and (c) increasing standard of living \cite{1}. From a perspective of more macro-region, it illustrated that the formation of a new town in the suburbs of metropolitan city is basically prompted by the corresponding relations between regions, between cities and urbanization factors. Hence, the development of metropolitan suburban as a new town is strongly influenced by external and internal factors of the metropolitan city. The most prominent external factor is the economic globalization effect. Utami states that global economic activity is not only formed in urban center, but also extends and ultimately has an impact on the area surrounding suburbs \cite{2}. This fact indicates that the new town development in metropolitan perspective in Indonesia shows spatially corresponding relation signs between core cities and suburbs as well as the
effect is very significant to the small towns around it. Basant Maheshwari et al, asserts that most of the future urban growth will occur in peri-urban areas that are complex to manage and have significant impact on the live ability of cities [3]. Urban growth is inevitably linked to peri-urban areas, the zones of transition from rural to urban land uses located between the outer limits of urban and regional centers and the rural environment. This perspective indicates that the new town development contributes positively to rural areas around. This condition is marked by changes in the structural and spatial pattern as well as suburbs land use conversion which are directly connected to the rural areas as a hinterland.

Moura points to the trend of "expanded metropolization", that is, metropolitan territorial expansion, the result of an almost uncontrollable peri urbanization, through which the urban proliferates and extends [4]. The polarization of function of activity of Makassar as the core city positively contributes to the development of the urban functions toward the suburb in the Mamminasata Metropolitan areas either concentrically or linearly along the main road corridors. The process causes the spatial transformation in the suburbs. Spatial physical transformation, due to the residential densification and trade urban functions, gives a very significant effect to the transformation process of economic and socio-cultural in the newly developed town as a pole of economic growth in the Metropolitan area of Mamminasata. This condition can be observed through the infiltration process of urban element to the suburbs and the area which became the widening area is the transition area that is undergoing intensive change [5,6].

Urban areas of Moncongloe-Pattallassang, the object of the study, is a suburb established as a new town in the urban systems of Mamminasata Metropolitan area and administratively correlated with Makassar city, Maros regency and Gowa regency. The new town area is now predominantly dwelled by local communities with the main activities orientation is the agricultural sector. The population in Moncongloe urban areas is 14,776 and in Pattallassang urban areas is 8,999. The functions of space that has developed are; (a), in Moncongloe urban area marked by the presence of the functions of activity, i.e.; settlement area of 37.6 Ha, office area of 1.01 Ha, trade area of 1.03 Ha, rice cultivation and plantations area of 2000 Ha. (b), in Pattallassang urban area, marked by the presence of functions of activity of; settlement area of 36.1 Ha, office area of 0.2 Ha, trade area of 2.5 Ha, rice field of 838.73 Ha and plantations covering 277.85 Ha. Both of these urban areas are an integral development of the new town area in the concept of urban area development of Mamminasata Metropolitan.

Figure 1. New Town Orientation Map of Moncongloe-Pattallassang Mamminasata Metropolitan as the Object of the Study 
Source: [31]
2. Research methods
This research was located in the suburbs of Moncongloe-Pattalassang developed as new town in the Mamminasata Metropolitan. The new town is considered to have different specifications to other suburbs in Mamminasata Metropolitan area, both in terms of the physical condition of the region and in terms of the development intensity and directly connected with the dynamic change of the local community.

This study aims at examining and analyzing the physical, economic and socio-cultural transformation in new town development of Moncongloe-Pattalassang as an integrated system development of urban areas Mamminasata Metropolitan. In accordance with the focus of the study, this research was naturalistic, holistic, and phenomenology. The selected research approach was qualitative and quantitative approach (mixed method) using case studies. Case study is a research on the quality of data. [7,8]. Thus the focus of this study was to examine and analyze the conditions and circumstances related to the spatial transformation physically, economically and socio culturally. The purpose was to understand and explore by describing the emerging phenomena associated with events, critical incident, expressed in depth, detailed, in a particular contexts and holistic.

The data collection methods used in this study were; (a) Observations, to observe the conditions and characteristics of the spatial transformation physically, economically and socio culturally related to the functions of developing space in the new town of Moncongloe-Pattalassang. Observations made in this study used field notes, periodic notes and check list for the purpose of observing the circumstances/situations or events related to the research problem and for the purpose of data search. (b) In-depth interviews, conducted to establish an understanding into the restricted environment of social reality to catch a glimpse of the social as it was. In-depth interviews in this research used tools such as; tape recorder, image and interview guides equipped with; loose notes and check list. In-depth interviews were used to explore the data: changes in utilization of space, social relationships patterns, social interactions, and social adaptation. The purpose was to compare before and after the new town built and developed. Instruments used this indepth interviews were the interview guidelines in accordance with the phenomenon which become the limitation of the research. (c). Documentation, this research used a variety of documents related to the circumstances and conditions of the new town of Moncongloe-Pattalassang. (d). Triangulation.

3. Results and Discussion

3.1. Conditions and Characteristics of Moncongloe-Pattalassang New Town
Geographically, the location of the new town of Mongcongloe-Pattalassang is in the suburban area in Mamminasata Metropolitan which has direct access to Makassar city, Maros Regency and Gowa Regency. This urban area is characterized by rural agrarian yet, marked by the dominant use of agricultural land. Spatial planning of Mamminasata Metropolitan (Department of Spatial Planning and Settlement of South Sulawesi Province, [9]), established that both urban locations are new town areas that will be developed. The concept of the new town development includes several activity functions; residential area of 1,119.55 Ha, trade area of 372.74 Ha, educational area of 172.86 Ha and some other functions of activities. This fact shows that land use conversion and urbanization which takes place in a new town, become the driving force that developed morphological changes both concentrically or linearly along the main road corridors. Hanief mentions three elements of city morphological establishment, namely land utility, road patterns, and the characteristics of the building [10]. Use of space of Moncongloe-Pattalassang urban areas’ conditions in 2011-2016 is in the following figure.
Figure 2. Space Use of Urban Area of Moncongloe-Pattallassang 2011-2016

Figure 2 shows that in 2011 until the end of 2012 period, there was no change yet. The dominant use of space in the new town was rice fields of 84.08% from the total land use, followed by mixed garden of 8.23%, fields of 5.34% and settlements of 2.24%. This fact illustrated that the intensity of new town development had not significantly changed in terms of use of space and still characterized by rural agrarian as well as that the local community activities orientation had not fundamentally changed. In 2013-2014, it showed changes in the use of space, characterized by the additional residential area by 5.45% from the previous conditions and the depletion of agricultural land area covering 17.7 Ha of rice fields, mixed garden area of 34.57 Ha and field of 60.18 Ha. Later in 2015-2016, the changes of new town’ use of space showed higher intensity, characterized by an increase in new residential construction, education, trade and services, as well as the construction of the road network. This fact showed that the characteristics of the use of space and the morphology of the new town evolved toward a very complex spatial expression in line with the implementation of development stage. There are 2 types of development of spatially developing new town, namely; First, concentrical development with its city center located in the CBD area and, Second, linear development along the Moncongloe-Mandai road corridor toward Maros Regency and Moncongloe Sungguminasa corridor toward Gowa Regency.

3.2. Transformation of New Town Metropolitan Suburbs

The phenomenon of new town development indicates that the changes of suburbs space utilization will continue from time to time and positively contributes to the morphology and typology changes of urban areas Mamminasata Metropolitan. This fact shows that despite giving impact on the productive agricultural land reduction, it also contributes in positive manner to the change of job orientation and the adaptation process of the local community, based on the space functions that will be developed. A plan on the use of space of Moncongloe-Pattallassang new town is in the following table.

Table 1. Plan on the Use of Space of Moncongloe-Pattallassang

| No | Space Utilization   | Width (Ha) | Percentage (%) |
|----|---------------------|------------|----------------|
| 1  | Settlement          | 1.119,55   | 33.16          |
| 2  | Offices and Services| 327.83     | 9.71           |
| 3  | Trade               | 372.74     | 11.04          |
| 4  | Bus Station         | 68.54      | 2.03           |
| 5  | Social              | 109.05     | 3.23           |
| 6  | Education           | 172.86     | 5.12           |
Table 1 illustrates that the use of space in the new town will significantly change in the intensity until the end of 2020. Based on the data obtained, it shows that from the total of the new town area, the dominant use of space is for the settlement of 33.16%, followed by the trade area of 11.04%, offices and services of 9.71% and 5.12% for education. What is interesting in the concept of new town development is to meet the needs of green open space, i.e; city forest of 7.24%, green lane of 5.72% and sports field and city park of 5.44%. This fact shows that the idea of a new town development concept is directed to generate development sustainability in order to maintain the ecological balance. Increase in the new town development through the fulfillment of social and economic activities functions is in line with the service scale and evolves towards the poles of economic growth, positively contributes to the agglomeration and dis-agglomerameration process of urban functions and the establishment of market areas in urban Mamminasata Metropolitan. Agglomeration appears "as the outcome of the interaction of increasing returns, trade costs, and factor price differences" [11].

Surjono, et al. ([28]), states that changes in land use of an area affected by; physical properties of soil, availability of urban infrastructure, distance to the strategic location, land use, and land status. So, the pattern of linkage relationships between spaces runs parallel with the increase in the number of new town population. Therefore, the physical spatial transformation of the new town positively contributes to the of rural agricultural land use conversion towards urban industrial cause a change in the orientation of economic and social activities of the local community level. Yunus ([12]), confirms that the spatial development process horizontally becomes a determinant of broader urban areas. That is, the development of the functions of new town urban activities is implicated directly to the additional urbanity area and becomes the factor of urban sprawl in the suburbs of Mamminasata Metropolitan. Hanief ([13]), states that the process of urban sprawl gives impacts including: (a) the environmental impact; (b) the transportation impact; (c) the land price; (d) changes in the form of the city; and (e) social change.

**Figure 3.** Position of Moncongloe-Pattallassang New Town in Urban Regional System in Mamminasata Metropolitan
From Figure 3, several things can be explained related to the new town development of Moncongloe-Pattalassang: First, the position of the new town will serve as a hinterland of Makassar and as a connecting lines between Maros and Sungguminasa. That is, in the future the new town will receive load of activity functions of; Makassar, Maros and Sungguminasa as a single unified connectivity system in Mamminasata Metropolitan urban areas. Woltjer ([14]), mentions that urban centers connectivity is essential for any urban land use options. Second, the dynamics of the new town development as a hinterland city will experience very rapid acceleration and very significant effect on the physical and economic transformation process, causing social change in urban local communities. Prados, ([15]), confirms that the effective polarisation between cities and country sides and the existence of interdependence among demographic processes, socio-economic and residential development in urban and rural areas provide complex landscape gradients. Third, the dynamics of the new town development positively contributes to the presence of the surrounding rural areas in terms of population migration process, related to the employment opportunities that may be achieved with the presence of urban activity functions. Dee Chan ([16]), states that the urban-rural relationship is based on the demand and the number of functions which are oriented regarding the town (urban). This condition is characterized by the process of urbanization, industrialization, land speculation and increased population mobility. This relationship is complementary and contradictory as a result of the economic system and the social relationship pattern between communities. Winarso et. al. ([17]), confirms that the suburban area is a transition area between urban land use and rural land use in which the boundaries are not rigid and dominated by mix land use, dynamic land value, work reorientation from agricultural to non-agricultural (urban industrial), assimilation of local residents and migrants, and mostly local people searching for informal employment to improve the welfare.

Fourth, the increase in linkage relationships between cities is high enough in its intensity; this condition is strongly influenced by the location of Moncongloe-Pattalassang new town geographically which is located on the node of transportation flow movement in Mamminasata Metropolitan. Babcock [18], states that node of transportation movements with the presence of the transportation shaft will result in concentric pattern distortion, because along the route of transportation is associated with high mobility. That is, that the population mobility and freight forwarding will increase from its previous state. This process is triggered due to agglomeration and dis-agglomeration function and capital flow increase towards the new town and the surrounding area. Dahuri and Nugroho ([19]), states that there are three capital flows processes will take place in the context of the metropolitan region development, namely; (a) capital in the form of money that is, flowing from one region to another following the exchange of goods and services flow or to finance investments, (b) capital in the form of physical assets, that is transferable capital from one place to another in a relatively limited number, (c) capital in a physical form that is non-transferable and changeable in its value or benefit. Those three factors illustrate that the physical transformation process in the new town development Moncongloe-Pattalassang runs parallel with the economic transformation process in the sense that the new town development requires high capital investment. Firman ([20]), states that there are three main goals of new town development; (a) to serve public’s need for a quiet, modern life as well as a safe environment; (b) to give them investment opportunities; and (c) to obtain quick financial profit.

Fifth, economic agglomeration develops along with the new town development. This condition has a tendency towards unification of the market area as a result of infrastructure support and government policy support factors. In a perfect market, the economy doers are rational and aim for maximum satisfaction and maximize their business potential, (Sukirno, [21]). Agglomeration is related to the market area as a result of the meeting of two or more different economic activities (Dahuri and Nugroho, ([22]; Tari gan, [23]). That is, that the size of each producer of market area will be meaningless because with the agglomeration, the market area tends to blend although they are not identical. Adisasmita ([24]), states that any developed market center has an influence on the complementary region. This condition illustrates that the new town development in a more macro perspective area will encourage the formation of the urban hierarchy. Sui et al, ([25]), “New urban
growth will manifest itself in the urban forms and spatial structures, and what kind of ecological impacts the new growth will bring”.

**Figure 4. New Town Development of Moncongloe-Pattalassang**

Figure 6 shows that one of the supporting factors to the presence of new town of Moncongloe-Pattalassang is a road network support that serves to connect several urban areas in the Metropolitan area Mamminasata. The urban areas here are; Hertasning Samata Utara area in the west, Antang area in the east towards Makassar, Pattalassang urban area in the north towards Sungguminasa city, Gowa Regency, Moncongloe-Mandai urban area towards Maros City, Maros Regency and surrounding rural areas. Another factor that supports the new town development is the entrance of developersto build residential facilities for migrants expansively. This fact illustrates that the intensity of settlement construction runs parallel with migrant’s arrival in the new town area. Setioko, et al. ([26]), mentions spatial settlements environment is built is influenced by two complementary components, which are population distribution and movement patterns. Spatial physical transformation relationship to social change in urban communities is in the following table.

**Table 2. Spatial Physical Transformation and Direction of Social Change of Local Community in Moncongloe-Pattalassang New Town**

| No | Spatial Physical Transformation Process | Construction Activities | Direction of Social Change and Impacts |
|----|----------------------------------------|-------------------------|--------------------------------------|
| 1  | Characteristics of Land Use Forms & Area Morphology Changes | • Development of economic activities (economic activities functions of the new town area Moncongloe-Pattalassang) • Development of social activities of new town area Moncongloe-Pattalassang • Construction of new and large scale settlement areas | • The ability in spatial articulation process and control of reproduction of space • Changes in Social Formation • Changes in social interaction and social adaptation |
| 2  | Characteristics of Building | • Changes in the building composition of building coverage ratio (BCR), floor area ratio (FAR), height of the building. • Building materials • Building architecture • Layout of the building • Status of the building • Function of the building • Building density • Orientation of buildings utilization | • Relation and patterns of labor relation • Changes in social structure (strata, status and social class of communities) • Social change process • Social segregation |
| 3  | Characteristics of Settlement | • Building style and architecture • Settlement infrastructure service • Design pattern of settlement area | • Social dynamic • Changes in the social order • Changes in social systems • Changes in environmental characteristics • Changes in cultural patterns |
| 4  | Characteristics of Circulation | • Population mobility • Transportation facilities and infrastructures | • Changes in social mobility • Change the orientation of production activities |
Table 2 shows the relationship between the spatial physical transformation processes and local communities socio-cultural changes in the new town of Monconglo-Pattallassang. Some interpretations that can be proposed related to the process of socio-cultural changes in local communities are: (a). Changes in the characteristics of land use and morphological changes of new town positively contribute to the ongoing process of spatial articulation. Spatial articulation is characterized by mode of production differences between the migrants and the local community. Differences in mode of production affect the differences in spatial reproductive control in a certain urban spatial articulation. Articulation of two mode of productions i.e, the capitalist mode of production and non-capitalist mode of production, indicates that the existence of capitalists is increasingly dominant or will increasingly dominant over the others [27]. Giddens, ([28]), confirms that reproduction is a process that is full of possibilities and is based on the activities of the agents. This process shows differences in growing economic activities, at one side, formal economy activities is dominated by the migrants and on the other, the non-formal economic activity, dominated by local residents. Differences in control of reproductive of space then develop towards social formation differences and social relations which are built. Thus the social structure of urban local communities has shifted in the role and functions in accordance with the prestige that can be achieved by an individual and is determined by the adaptive ability due to changes in environmental stimuli. This fact shows that the change in the social order of local communities is a transition from traditional agrarian social order to the urban industrial social order. (b). Changes in the characteristics of the building is marked by changes in the composition of the building, building coverage ratio (BCR), Floor Area Ratio (FAR), the height of the building, the use of building materials, building architecture, building layout, the status of the building, the function of the building, building density and orientation of the building utilization. This process leads to changes in relationships and patterns of employment relationships, from the traditional system of work then evolved towards a modern urban society work system. That is, changes in relationships and patterns of labor relations agrarian society traditionally move toward work relationship patterns that is contractual, so it gives impact on the change of social solidarity from fully mechanical solidarity to organic solidarity [29,30]. Furthermore, differences in building ownership, building materials, building layout and function of the building, show inequality in wealth and welfare between migrants and the local community. This process then causes changes in the social structure in terms of sharpening the economic strata, status differences based on effort and ability that can be achieved as well as lifestyle differences between the migrants and the local community. The direct impact that can be observed as a result of physical transformation in perspective of characteristics of building is revolutionary social change and runs parallel to the construction phase of the new town development. (c) change in the characteristics of settlements in the new town, is characterized by differences in the style and architecture of the building, residential infrastructure services and housing design patterns.

4. Conclusion
From the discussion, several things can be concluded as follows:
Collaboration in the new town development causes the land use conversion from full productive agricultural towards urban industrial characterized by the morphology diversity. The growing morphology diversity and sufficient transportation supports become the driving force of integration of the surrounding urban activity system becomes the determining factor of changes of the orientation of the of local communities activities from fully farming towards non-formal economic activity. Differences in orientation of community based on the segmentation positively associated to the coexistence of the two types of modes of production with a tendency towards the formal economy type driven by the capitalist sector and the non-formal economy type driven by pre-capitalist sector but not in a hierarchical position.

Physical and economic transformation leads to the socio-cultural transformation of local communities, characterized by differences in economical social relations and wealth gap between communities. The complexity of growing economic activity and control of reproduction of space
inequality of new town as well as the differences in adaptability on evolving space reproduction influence in the marginalization and poverty in urban local communities. Marginalization and poverty in urban local community urban gives impact on the penetration on empty spaces, urban public space for the need to build residential facilities and non-formal urban economic activities as a form of community existence.

5. References

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