

FIFTY YEARS OF RESEARCH ON HUMAN SETTLEMENTS AND ITS IMPLEMENTATION IN INDONESIA

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ABSTRACT. This paper is attempted to discuss various research on human settlement programme in Indonesia either in reference to urban settlement or rural in the role of research that has been regarded as an important one. The range of issues and problem were like a long string stretched from designing a new town to urban kampung improvement; from building a communal toilet to simple water purification method; from gender issues to making soil blocks.

The discussion of this paper will covered many range of issues as follow: research to build new satellite town for Jakarta, research in developing alternative building materials, appropriate technology in sanitation and water supply, research to support improvement of rural housing, and finally, research in connection with natural disasters.

Keywords: human settlement, urban, rural

ABSTRAK. *Tulisan ini akan memaparkan berbagai macam studi penelitian tentang program permukiman di Indonesia baik dari sudut referensi pada permukiman perkotaan maupun permukiman pinggiran sebagai salah satu masalah yang terpenting pada penelitian ini. Berbagai isu dan masalah diangkat dari mulai bagaimana merencanakan sebuah kota baru sampai pada perbaikan kampung di perkotaan, dari mulai membangun kamar mandi umum sampai dengan metode purifikasi air yang sederhana, dari mulai isu gender sampai pada masalah pembuatan blok-blok tanah.*

Penjelasan dari tulisan ini akan mencakup beberapa isu sebagai berikut: penelitian atas pembangunan kota satelit baru bagi Jakarta, penelitian dalam pengembangan material bangunan alternative, teknologi tepat guna dalam sanitasi dan suplai air, penelitian dalam mendukung peningkatan kualitas pada permukiman pinggiran dan terakhir akan membahas hubungan dengan bencana alam.

Kata kunci: permukiman, perkotaan, pedesaan/ pinggiran

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INTRODUCTION

It could be said that soon after the Second World War ended, research on human settlement in Indonesia become significant when it was part of the planning in 1948 to build the so called '*Kebayoran Baru*' (New Kebayoran) a satellite town planned to cover 730 Ha for 100.000 people located 18 Km to the South of Central Jakarta (formerly known as Batavia Centrum).

In its early phase the target of population of Kebayoran Baru had to be changed from 100.000 to 180.000 due to the influx of civil servants to Jakarta; and consequently the number of particularly the small unit of dwellings and semi permanent housing types had to be increased almost to the double, and causing thus the need to change the planning of zoning of Kebayoran Baru,. To support this the Ministry of Public Works which become the responsible institution after the transfer of Government from the Dutch to Indonesia in 1949, to conduct research on alternative building materials, and to find second best solutions in the provision or supply of low- cost housing, become a pressing need not only for Jakarta but for other major cities in Indonesia as well.

The establishment of the Regional Housing Centre attached to the Building Research Institute in Bandung – West Java Province in 1953, which was sponsored by the United Nations Organization in collaboration with the Ministry of Public Works, has stimulated the progress of various aspects related to human settlement issues in Indonesia and in the countries in South East Asia and the Pacific which climate belongs to the hot humid region .Cooperation and contribution from donating developed countries through technical assistance both in form of experts, fellowships , infrastructures and finance, all had enhanced the progress of research and development in the field of human settlements in an invaluable way. It also support the establishment of various institutions in Indonesia which up to the present still play an important role in the development and progress of urban housing in particular, and rural housing development in general..

A selection of research activities in human settlement and its implementation and dissemination within the last 50 years, are highlighted in the following headings.

RESEARCH TO BUILD A NEW SATELLITE TOWN FOR JAKARTA.

On August 17, 1945 soon after the Second World War ended, Soekarno and Hatta proclaimed in Jakarta, the Independence of Indonesia as a Republic which alas was followed by a short but decisive turbulent years known as the Independence Revolution.

At the same time the Allied returned to control the country and established the so called NICA administration (Netherlands Indies Civil Authority) which made Jakarta to become a divided city as being the seat of two governments on national level , and two authorities on the management of the municipality of Jakarta..

Under the administration of the Dutch controlled area of Jakarta, an ambitious plan to build a self contain satellite town of Jakarta was introduced in July 1948. It was geographically located 18 Km from central Jakarta, situated within the administration of Kebayoran District, under the Regency of Jatinegara (formerly known as Meester Cornelis).

Within only a year, all preparation from land acquisition to the design of the town plan including the various housing types needed, public buildings, the necessary town infrastructures and public facilities were ready, including the financing scheme for the construction of this particular new town.

The first stone laying or the actual physical construction of *Kebayoran Baru* (New Kebayoran) took place in March 1949, in a time which from the point of view of the Indonesian side was a decisive period both from the side of political as well as economical situation. In December 1949 when the formal transfer between the two Governments became a reality the whole development of Kebayoran Baru town become the responsibility of the Ministry of Public Works of Republic of Indonesia, and appointed Ir. Santoso as the a Head of the Special Project of Kebayoran Baru Town known as PCK (*Projek Khusus Kota Kebojoran Baru*).

Virtually however the construction of the satellite town was initially done in 1948 by CSW (Centrale Stichting Wederopbouw/ Reconstruction Central Institute) under a Dutch team lead by Ir. E.W.H. Clason and Ir.C.J.E.Klencke as first engineer which included in the organization the only available Indonesian engineer practitioner at that time, M. Soesilo who was the former Chief of Jakarta Municipality Public Works during the Japanese Occupation Government of Indonesia.

The research and design in the preliminary process of the town planning was under the advice of Prof. Ir.Jac.P.Thijse which emphasized how in the shortest time a new town can be realized. There had been a polemic in the design of Kebayoran Baru town plan, between Prof. Ir. V.R.van Romondt who was then the inspector of the Department of Archeology; and also as Head of the Department of Architecture at the Bandung Faculty of Engineering- University of Indonesia (the former 'Technische Hogeschool ' and now known as the Institute of Technology-Bandung), and M.Soesilo who was the chief of the Town Planning Bureau in the new town organization scheme.

The vision of the latter which was based on a research data on socio-cultural aspects, had the conclusion that the majority inhabitants of Kebayoran Baru would consist of urbanized Indonesian of the middle income and the lower income group but having already a westernized life style rather than those who were still practicing the traditional customs. Also taken into consideration in this matter was the idea that Indonesia was heading into a new era, and Jakarta had to prepare its entrance as a capital of a new state in the international world. With such a thought as a background, the housing neighbourhoods were planned as a synthesis fitting for a western and eastern life styles. Prof.Romondt, who was a very distinguish scholar on Indonesian traditional culture and had a very high appreciation of the traditional cities in the archipelago, made certain criticism that Kebayoran Baru should instead properly planned following the traditional roots.

After the transfer of CSW function to PCK, the planning of Kebayoran had to change its original target from 100.000 inhabitants to 180.000 due to the influx of mainly the loyal to the Republic civil servants of various levels coming from Yogyakarta which was made as the temporary capital city of the Republic between 1946 -1949 during the so called Dutch 'Politieele Acties' period.

To fulfil this target, the number of the semi permanent housing and the small types of dwelling had to be increased almost 80 % from the original plan. Consequently adjustment in zoning was needed.. In the process of developing Kebayoran Baru town, the cooperation with Dutch man power in the higher levels was still maintained. Also the dependable collaboration with various engineering laboratories at the Bandung Institute of Technology continued, respectively with the Laboratory for Hydrology, Sanitation, Road Construction, Geology, and Mechanical Engineering where the Dutch lecturers were still in service. In regard to elaborating low cost building materials especially the suitable organic materials such as bamboo and wood species, collaboration were made with the Faculty of Agriculture and Forestry in Bogor. While for the greening of the new town, sought advice from the Bogor Botanical Garden.

Kebayoran Baru might not grow to be the town as the original planners and designers had in mind, since today it is still in a dynamic mood to regenerating itself in spite the fact that a fast area of the town was declared in 1974 as a historic protected area. Urban conservation to preserve certain characteristic of its streetscape and typical housing quarters are faced with problematic constrains and almost beyond control by the local authorities. Kebayoran Baru is no longer a separate city as it was conceived, but an integral part of greater Jakarta in general, and is today the city centre of South Jakarta in particular.

Nevertheless the experience in creating Kebayora Baru town was invaluable and much had been learned. The new town was indeed a historic mile pole for the Republic in the field of town planning and when in 1960 the Ministry of Public Works received another task from President Soekarno to build a new town in the interior of the island of Kalimantan (Borneo), although limited in regards to skill and number of man power, the core technicians of Kebayoran Baru project could at least become a dependable team for the planning and building of Palangka Raya., the capital of the newly founded Province of Central Kalimantan.

RESEARCH IN DEVELOPING ALTERNATIVE BUILDING MATERIALS.

In the first two decades of Independence, beside the accomplishment in the delivery of low cost housing in Kebayoran and in the nearby new housing estate locations (Pejompongan, Slipi and Grogol housing), it was also realized that the construction of small dwelling units and the semi permanent dwellings is actually a national problem. In the housing policy, a distinct division between urban housing and rural housing were made. Each had its specific problems and involving other Ministries as well next to the Ministry of Public Works. Those were the Ministry of Social Affairs for dealing with isolated tribes, and rural housing development, the Ministry of Internal Affairs for rural development and town management; and the Ministry for Transmigration for organizing resettlement of poor families living with sub-standard condition in very high density areas in Java and Bali. They were resettled to other Provinces in the mayor islands which were still scarcely populated and in need of man power accelerate progress in their regional development programme. Transmigration projects include among other things, to execute land clearance of fringe areas of unproductive forests land, the building of infrastructure, the construction of shelters, and the provision of livelihood for certain period.

All above mentioned activities which relates to human settlement were supported by specific research projects at the Building Research Institute/Regional Housing Centre Bandung in cooperation with the Directorate of Housing and concern Directorates in respective Ministries.

As already mentioned in the introduction, the Building Research Institute was established by the Ministry of Public Works with the objectives to develop among other things developing low cost and appropriate building technology in the delivery system of mass housing, which initial experiments were made already by the Department of Housing in Jakarta in cooperation with the Engineering Laboratory at the Institute of Technology – Bandung. This laboratory was in fact the embryo of the Building Research Institute (BRI) in Bandung, which in 1953 received an additional role as the Regional Housing Centre (RHC) –Bandung, for the research and development of low cost housing in the developing countries in the hot humid climate areas in complementary with another Regional Housing Centre in Roorkee –India which dealt with the hot dry

climate areas Both RHC's were established with aid from ECAFE (Economic Commission for Asia and the Far East, now known as ESCAP –Economy and Social Commission for Asia and the Pacific) and the United Nations Organization.

At RHC-Bandung particularly, foreign experts from various developed countries both from Europe (such as from Norway, Denmark, Sweden, the Netherlands, Belgium, UK,) from Australia, New Zealand, and last but not least, a well established cooperation with various institutes from Japan. All counterparts from abroad were sharing experience with Indonesian researchers or other fellow researchers from South East Asia and the Pacific region under the sponsorship of UNDP or on bilateral bases.

The coverage of research topics or themes were both on technical as well on socio-economic or socio-cultural issues of human settlements, and which accomplishments will be describe briefly under the following points.

Building Material Research and Studies.

It was recommended that an in-depth research should be made in using local indigenous materials and industrial waste for the production of cheap or affordable building materials for low cost housing. Notable results were among other things :

- 1) The use of bricks of stabilized pressed soil or adobe bricks.
- 2) The use of volcanic/pozzolanic soil to be combined with lime and pressed by a hand operated machine to become building blocks in various size types. In the block making process no firing is needed.
- 3) The process of making bamboo mats in a standardized size by using mechanized tools, and produced as a 2 or 3 layer laminated bamboo panels for wall construction or as dividers..
- 4) The process of making panels made of industrial waste such as coconut fibre, sugar cane fibre, wood shreds or chips, etc. A special factory manufacturing particle boards suitable for wall panels and for making furniture was built in the late 1970's at Sukabumi-West Java, using as raw material unproductive or old rubber trees from nearby Plantation. It was a technical cooperation with Belgium.

- 5) To process second class wood for building material by preserving it first through hot or cold chemically soaking process, and made it into pre-cut components in various standard sizes planks for nailed frame construction of walls or for roof trusses. (Actually some of those particular alternative low cost building materials were already found already its implementation in the construction of small dwelling units and semi-permanent housing projects in Kebayoran Baru).
- 6) To popularize the use of red-cement made from crust of waste or damaged bricks or tiles which was an alternative for standard cement. Red-cement as also used in the mixture for plaster and even for flooring. The preference to use red-cement was due that standard Portland cement in those consolidating decades in Indonesia must be imported from abroad and as scarce in the market, besides its high price The Government recommended that the use of cement for low cost urban housing and for rural housing to be as minimum as possible. Cement was needed in great amounts in the construction of concrete buildings and infrastructures in the cities, especially in Jakarta.

APPROPRIATE TECHNOLOGY IN SANITATION AND WATER SUPPLY.

It should be noted that all development project had a planning umbrella launched by the Government through the National Planning Board (BAPPENAS) and presented to be endorsed by the Parliament in the form of the so called National Development Plan.

During Soekarno era (The Old Order) it was called the 8 Year National Plan; During Suharto (New Order era) it was made into the 5 Year National Development Plan; and this pattern continued to the Reformation era of 1998 and up to the current Government.

In the field of human settlement, town planning in general and housing in particular, a distinct policy and strategy in dealing with urban development and rural development were made and divided the tasks to specific Ministries as the responsible institution. However changes had been made as done by the second President of the Reformation era in 1990 like abolishing the Ministry of

Social Welfare , deleting The State Minister for People Housing or restructuring the Ministry of Public Works into the Ministry for Regional Infrastructure Development and Human Settlement. (By the present Government all three Ministries were re-instated as they were). The fact remains that urban and rural human settlement are approached as two different issues.

Research for improvement of Urban 'Kampongs'

A 'kampong' (*kampung* in Indonesian means village or hamlet) in the current urban context is to denote a neighborhood usually densely populated with sub standard urban facilities and inadequate infrastructures impressing quite easily to be identified as slum areas. Since the 1970's a massive project known as Kampong Improvement Program (KIP) with technical assistance from the World Bank was launched as a start in the 3 largest cities in Indonesia (Jakarta, Surabaya and Bandung) under the management of respective local government in collaboration with local universities or non-government organizations and of course the community themselves. Prior to its implementation a socio-economic research was usually done, covering for example a survey of existing condition, data collecting of the area morphology and urban pattern, demographic statistic, and the detailed design of infrastructures and facility buildings to be constructed, according to the local need.

A general concept was then conceived for KIP phase I, which focus was on the physical improvement as stated above. The physical improvement of infrastructure was in fact one part of the three main KIP targets which points are the following.

- (1) To awaken awareness of the community of their own potencies to improve their living condition and their quality of life. This activity is the human aspect or *Bina Manusia*. (*Bina* means guidance; *manusia* means man/human. This part was a matter of human approach and psychology of mass persuasion as done by social workers. It become a priority in KIP phase II in the 1980's when KIP phase I of the 1970's was completed.
- (2) To motivate their direct participation in improving the physical condition of their environment and to share willingness in its maintenance.

This goal is known as the environmental aspect or *Bina Lingkungan* (*lingkungan* means environment). It is also known as KIP phase I. This concept became a priority by taking for granted that the improvement of the environment's physical condition and its infrastructure like betterment of footpaths, street gutters, provision of public taps for potable water, building communal facility for washing/ toilet /bathrooms, and organizing garbage disposal services, could trigger the enhancement of public health in the area and could also heighten the people self esteem.

The construction cost of infrastructure improvement were contributed by the local government from the World Bank loan. Infrastructures projects as mentioned above were usually based on a standard design recommended by the Public Works which data might refer to research results of RHC-Bandung. KIP projects were in the mean time implemented in all larger cities in Indonesia

- (3) To encourage the community in increasing entrepreneurship for promoting family income, with special attention to women's role and potentialities. This action is known as the livelihood aspect. (*Bina Usaha : usaha* means business). In this field various training activities or assistance in finding loan for starting small business was rendered by the local government, or other relevant sources in getting social funds. (KIP phase III of the late 1980's and early 1990's). Establishing cooperative shops, networking in home industry (food, garments etc.)

KIP activities in Jakarta has reach now to stage IV in which it was up to the wishes of the community themselves to determine the priority of aid they proposed to the local government. It is also the community themselves that must manage the implementation of their own KIP while the local government acts as facilitator and supervisor.

Successful KIP were many, some received even international recognition and award (e.g. the Aga Khan Award for Architecture, 1970 ,1972 and 1976) or become model for good accomplishment discussed in international seminars etc. However, there were also experiences of less successful or even failures, although the percentage was small. Completion of KIP could increased land price, and some of the original

beneficiaries of KIP might sell their house or land and moved elsewhere to another sub-standard environment. Post construction maintenance was usually inadequate and become rather a problem, among other causing the provided facilities a too soon deterioration while funds for maintenance was not easy to acquire since it must be sought through other channels

The 'blame' when such negative results occurred was that the approach in the development process was too much top-down rather than bottom-up, or that the project was pressed by time constrain and dominated by accomplishing for the sake of quantitative targets rather than quality.

Research in urban mass housing.

As part of the issues on urban human settlement was the stress and need of affordable housing for the majority of urban population which also belonged to economically weak strata. In this respect prior to the decision by Government to establish *Perum Perumnas* (The National Housing Authority) which followed by assigning the *Bank Tabungan Negara –BTN* (the National Saving Bank to function as a mortgage bank for housing, in 1972, RHC-Bandung since the late 1960's had built low-cost model houses of various type, using second best solution methods in respect of the building material used, and application of easy and practical building technology. The design of house types were based on the concept of minimum standard and on modular coordination

The various house type consisted from T36 (means 36 m² floor area) to T120, and could be in form of row houses , detached building types, two-floor dwelling (maissonete) types, to 4 storey walk-up flats. These first generation design of dwelling units were called prototypes which through the time it was adopted and further elaborated by *Perumnas* in their mass housing scheme all over the country. However in the later years, the price of *Perumnas* was not affordable even for the smallest type. They were still too expensive for the targeted consumers that lowering the standard and minimizing the dwelling unit floor area from 36 m² to 21m² and even to 18 m² were necessary.

Recommendation by UNCHS (UN Centre for Housing and Human Settlement) to develop mass housing through site and services by providing a toilet structure

only, was never implemented in Indonesia since the Minister of Public Work then (Radinal Moochtar) had the opinion that it was a discourse to the local culture.

Compromise was taken that Site and Services Housing in Indonesia is to provide one main standpost or tap of water through pipe distribution system or a water pump, and a connecting line for electricity as the basic for further development by the prospective occupant.

Many of the economically weak community such as factory laborers, people without definite income as civil servants were not eligible to apply for *Perumnas* housing. Fortunately certain involvement of lecturers of various universities had shown a proof that with their consistent dedication solution to assist these needed people for having a decent shelter could be a reality.

Their approach which was virtually community or popular base was strengthened by feasibility studies and research. A praise worthy to mentioned in elaborating this approach in the 1970's is the late Prof. Hasan Purbo from the Institute of Technology- Bandung. His ideas has continued to develop until to day.

In the total delivery system of urban housing, the share of *Perumnas* , which was identical as the Government share, was only 20 %. Which means that the opportunity to participate of private investors in the housing market were wide open. Between 1970 to 1997 larger cities in Indonesia saw a boom in real estate development to such extend that for Jakarta especially a rule was set by the Governor (Ali Sadikin) that regulated a ratio for the attention of Housing Developers. It referred namely that the ratio 1: 3: 6 meaning 1 very expensive luxurious house, against 3 middle expensive house, and against 6 low cost houses. The rule however gave a provision that the 6 low cost houses could be built elsewhere outside the luxurious estate. And here begun the cheating.

After 50 years of tackling housing problem in urban areas, the gap between housing need and the capacity of supply especially of houses for the urban lower middle and lower class people, is getting greater rather than closer.

It was also due to the economy crisis of 1997 which alas for Indonesia its recovery was slow and hindered by political conflicts.

RESEARCH TO SUPPORT IMPROVEMENT OF RURAL HOUSING.

As stated earlier, the strategy of rural housing improvement in the frame work of rural development in general, has a specific strategy. In the span of 50 years the rural population was decreasing from 80% out of 150.million population to 70% out of 200 million of the current Indonesia total population.

Further more the pace of rural progress had been rather slow. Reflecting to the condition of half of a century ago, rural people lives generally in dwellings – the so called traditional houses- which from the point of view of health were judged as very inadequate. Such valuation was based on the high data of statistics that indicated houses were without windows, going to the toilet to nearby river or backyard pond and bringing animals into the house to spend the night were still persistent. In short, total improvement was deemed necessary.

It cover among other things the need:

- (1) To build connecting accesses to reach remote villages, paved it with stones or asphaltting the village road ,
- (2) To improve the quality of houses with better or more durable local building materials,
- (3) To protect water wells and water sources with eventually pipe distribution system or sharing water tap,
- (4) To provide communal bathing/toilet facilities,
- (5) To extend network of village electricity.

All those activity were based on mutual self help or by the implementation of local customs such as the *gotong royong* or *arisan* systems or self help as the local tradition had taught it. Also the technology for renovating the dwelling, to purify water, or to construct toilets were based on 'easy method' or appropriate technology.

Training the community before actual implementation was usually part of the whole process. Furthermore the implementation of above mentioned

improvement projects were valid to conventional rural areas where the people were predominantly farmers or fishermen.

Generally, human settlements problem in rural areas was executed technically in situ as a collaborative efforts between respectively the Divisions or Services under the Ministry of Internal Affairs, Ministry of Social Affairs and the Ministry of Public Works.

For the isolated tribes or roving tribes in forest fringe areas, the approach was different since they had to be first 'pre-conditioned' before any suggestion to settle down nearer to roads could be made or to do any change concerning their daily life. For this particular task it was the Ministry of Social Affairs which dealt with it.

While for resettling families originated from over crowded areas in Java and Bali to scarcely populated areas in Sumatra, Kalimantan and West Irian (Papua), the preparation to clear hectares of unproductive forest and transformed it into a preliminary settlement and plotting it into 1 Ha land to toil plus building a 20m2 to 36 m2 dwelling unit on it, and also connecting it by a stretched ribbon road systems, all were the management of the Ministry of Transmigration. In this particular kind of project, an intensive and in depth research including the use of data by satellite remote sensing was used in the planning and executing transmigration projects. Transmigration projects had not only a consequence of technological impact but what was more essential and more dominant, was the socio-cultural impact. Adaptation and assimilation of migrants into a new territory of different ethnic was thought as a probable smooth process. However beyond all expectation a sudden sentiment of violence could occurred as it happened during the economic crisis of 1997 in Indonesia. Migrants from the islands of Madura-East Java came into violent conflict with the native Dayaks in East Kalimantan which caused thousand of refugees returning to Java after 2 generations had been living in peace and feeling as one nation.

By the ending of the 20th century in Indonesia, a political change happened called the Reformation and has revived democracy. Administrative centralized system had shifted to decentralization and ethnic consciousness of diversity

become stronger and even to the extreme of triggering certain sentiment of separatism.

From the view of resettling a mass of people as it was done so far, it seemed that re-evaluation through socio-economic and socio-cultural research had yet to be conducted , to learn what was sliding after almost a half century accomplishing transmigration projects

RESEARCH IN CONNECTION WITH NATURAL DISASTERS

Emergency action to assist victims in stricken areas on the occurrence of natural disasters such as volcanic eruption, earthquake, floods and tsunami, landslides, had also been a task of the Ministry of Public Works to assist in the post occurrence rehabilitation work. It covered not only concerning the immediate help to restore or reconstruct what was damaged, but included as well to give technical aid and information to the population how to build for example houses with better resistance to earthquake; or whatever technical information were needed in an emergency situation caused by other natural disasters. BRI/RHC-Bandung had designed various prototype easy to construct of emergency shelters or certain public buildings (schools, hospitals) as guide to the local Public Works.

In particular on earthquake resistance building technology, BRI/RHC-Bandung had collaborated with several institutions including the Building Research Institute in Japan and their experts to conduct research and model investigation in the behavior of earthquake. A tilting table to investigate tremor and behaviour of earthquake was installed at BRI/RHC laboratory in full scale model

In fact it should be noted that the very first tall building in Jakarta built in 1963 reaching over 30 floors was a prototype of earthquake resistant building even in the context for building practice in Japan.

Finally, in urban settlement, in the urban kampong areas especially, the break of fire was a big hazard to be overcome with. Research efforts had been made by BRI/RHC to produce cheap, fire resistance building panels, however its marketing feasibility was low.

CONCLUDING REMARKS

To support various human settlement programmes in Indonesia both in reference to urban settlement as well as rural the role of research had been important.

The range of issues and problem were like a long string stretched from designing a new town to urban kampong improvement; from building a communal toilet to simple water purification method; from gender issues to making soil blocks .

The findings through appropriate technology of all those innovative things from new building materials to simple ways of living in a house with better conveniences, found however certain constrains in attracting support for investment by the industries. Research at BRI/RHC-Bandung was meant to introduce a prototype, a sample, or a possible method, rather to an actual commercial big scale production. It was fortunately enough that certain results of research on the technology related to human settlement received acceptance by investors as small cottage industries and has convinced local consumers in rural areas in using those affordable materials. Greater efforts was needed in the dissemination and information systems. In this connection. BRI/RHC-Bandung initiated a network of Building Information Centers in 5 Provinces through a cooperation project with the Bouw Centrum – Rotterdam in the 1970's which to day grew to become a network to cover all Provinces except the those new Provinces founded in the last two decades. (1985 -2004).

Research in human settlements was naturally also done by many other institutions as well, universities, relevant Ministries, professional and industrial institutions, and also non-governmental organizations.

The National Board for Science and Technology (*Badan Pengkajian dan Pengembangan Ilmu Pengetahuan dan Teknologi Nasional –BPPTN*) was another important institute established in the 1970's which has shown a great interest also in the research of human settlement especially in the macro context of matters on environmental ecology

Research on human settlements will continue into the next decades, and naturally with new challenging problems both on urban and rural development issues. Jakarta was predicted in this century (Agenda 21) to become a megapolis populated by more than 15 million inhabitants, and with population still predominantly belonging to the urban poor. Urban population in Indonesia will raise to more than 35 % from the predicted a total population nearing 250 million. The face of the Indonesian cities and villages in the 21st century could not be imagined without being supported by the world of research and studies. It means that research on human settlement will always be important, in the past, now, and the future.

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All photographs are from the author's collection.