



A Study On Multistoried 'Palli Janapad' Housing As A Compact Township For Agricultural Land Restoration In Rural Bangladesh

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ABSTRACT

The majority of the rural population of Bangladesh experiences issues with their quality of life and their ability to support themselves and they have a dream to have a colorful urbanized life. To fulfill their dream and to accommodate new generations, people are constructing unplanned buildings destroying agricultural land. Therefore, an unplanned horizontal urbanization is occurring in rural areas which would have a negative impact from social, economic, and environmental perspectives. To save agricultural land, Bangladesh Government has taken a research-based prototype project named 'Palli Janapad' at several districts. At Jamalpur, Bogura there is an under-construction project supervised by the Rural Development Authority, Bogura which is going to fulfilling the goal of the project. The aim of the study is to learn about the administrative and initiation process and to investigate the construction process, architectural design aspects, and building materials. A site survey is conducted to inspect the actual scenario of the project. The government can take the initiative to develop all villages like 'Palli Janapad' for the overall development of rural Bangladesh if the research results show it is sustainable. There are some important aspects regarding building materials and construction techniques which can create examples to develop sustainable buildings whereas the whole project should have more revision according to the context to grow a sustainable community.

1. Introduction

Bangladesh is primarily an agrarian nation, and since agriculture accounts for around 15.33% of the country's GDP and employs about 45% of its work force, it is the economy's single greatest producer [1]. The structural change in Bangladeshi agriculture came under scrutiny over time. A process of structural change is brought on by changes in policy, the transition to capitalism, access to technology, and education. Migration occurs frequently as a result of the allure of the great metropolitan lifestyle and improved quality of life. In comparison to agrarian work, industrialization gives substantially better pay. Between 1991 and 2010, the percentage of households' income that came from agriculture fell from 40.1 to 29.73. [2]. Integration with larger cities is a constant feature of Bangladesh's modern rural landscape. Increased rural-

urban connections, the rise of non-farm employment opportunities, and the widespread adoption of urban lifestyles have all contributed to the erosion of once-distinct social and cultural practises. As ties between rural and urban communities grow stronger, the physical layout of rural and urban areas changes to make room for age-old practises. Changes in lifestyle, family dynamics, livelihood options, and other areas are inevitable as the agrarian social structure is moulded by the pervasive influence of globalisation and urban expansion [3]. Thus agricultural lands are being deteriorated by rural settlement. The rate of losing agricultural land every year due to horizontal growth in housing is from 0.5% to 1% [4]. Total agricultural land reduced 1,126,750 ha during the past 34 years (1976-2010) with a yearly average loss 33,140ha [8]. For the time being, it is essential to plan compact development. In this context, economist Dr. Salim Rashid

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has conducted his research introducing the term 'Compact Township'. The compact township typically entails creating cities within Bangladeshi villages where residents would have access to contemporary amenities including schools, colleges, and healthcare, shops for their children. The villagers aren't required to waste their agricultural land because they will live inside a specific periphery [5].

Three decades have passed since 1978, and rural China, like Dancheng County in Henan Province, has changed drastically. Significant and rising out-migration of rural labourers within the urban-rural dual-track system has accelerated the rural hollowing phenomenon, creating significant obstacles to improving land use efficiency and coordinating urban-rural development. Two community-based practises of rural residential land consolidation and allocation (RRLCA) have been implemented in TAAs across China as a means of addressing these issues. These efforts have been successful in improving local infrastructure, increasing farmland, and bolstering the growth of rural businesses. Self-organized rural planning, democratic decision-making processes, and endogenous institutional innovation are some of the hallmarks of these initiatives, which can provide valuable lessons for future RRLCA initiatives [6].

In the context of the situation, the Rural Development Academy (RDA) of the Bangladesh Government had already submitted a project to the planning commission through Rural Development and Cooperative Division (RDCD) for land restoration to save the agricultural land and to establish a self-sustaining rural housing system realizing about the vertical expansion of the building. The project was 'Action Research Project on "Construction of Co-operative based Multistoried 'Palli Janapad' Housing with Modern Urban Amenities for Livelihood Improvement of the Rural People.' This initiative is the very first step of the Government of Bangladesh according to the integration of rural settlement and agricultural land and appeared as a pilot project which would be multiplied in near future in different areas of Bangladesh. So, the detailed study and careful assessment of this project need to be seriously committed by observing the pros and cons of the objective and the overall process to preserve the precious and limited agricultural land, and also the well amount of human-land relationship. This study also includes the building materials and the design aspect of the housing.

2. Objective

1. To study the administrative & initiation process of the Project.
2. To visit the construction site to observe the actual scenario and architectural spaces of the built project.

3. Methodology

To undertake this research, a detailed examination of

the initiation, administrative procedures, and allocation processes is necessary. Due to the dearth of previously conducted research on architectural design in this setting, primary data must be heavily relied upon. In order to successfully complete the research, both primary and secondary sources will be used. The author conducted a site visit to a relevant construction site and based their criticisms on what they saw there. This method guarantees a thorough and objective evaluation of the architectural design processes under study. Key Informant Interviews will be conducted with the key officials who have good knowledge about the initiation of the project. Development Project Proposal and Feasibility Study report will be collected from secondary sources of Rural Development Academy, Bogura, CIWM, LGED to collect the initiation process of the administrative framework and also the allocation process. From all these survey data, recommendations would be placed.

4. Action Research Project –Palli Janapad

To save agricultural land, the Rural Development Academy (RDA) has taken initiatives by consolidating more than 38 years of experience in rural development aspects towards maximizing the utilization and restoration of the land. During the study of CIWM of RDA, the scientists found some difficulties as some people fabricated their cottages in agricultural land in a scattered manner. In this view, RDA is thinking about the vertical expansion of the building as a priority measure for newly built-forms.

In the context of this situation, RDA had already submitted a project to the planning commission through Rural Development and Cooperative Division (RDCD) for land restoration to save agricultural land and to establish a self-sustaining rural housing system. The project was 'Action Research Project on "Construction of Co-operative based Multistoried 'Palli Janapad' Housing with Modern Urban Amenities for Livelihood Improvement of the Rural People.' The aim of the initiative is to accumulate the scattered people in a common shelter on 1.5 acres of land with all modern utility facilities including modern hygiene and waste management in low-cost multistoried building Project Evaluation Committee (PEC) has decided to take initiatives to undertake action research pilot project at manageable scale at the final approval. The project was introduced at 7 sites in 7 divisions of Bangladesh. [7]

This initiative is the very first step of GoB according to the integration of rural settlement and agricultural land and appeared as a pilot project which would be multiplied in near future in different areas of Bangladesh. So, the detailed study and careful assessment of this project need to be seriously committed by observing the pros and cons of the objective and the overall process with outcome.

The specific objectives taken initially are as follows:

- To improve the lifestyle and livelihood of the rural community, construct multistoried building in rural areas with modern urban

facilities;

-To construct seven numbers of four storied low-cost rural housing with all utility

facilities and 272 flats to accommodate the scattered rural people in a common shelter

for making it a rural-level growth center;

-To construct seven numbers of two-storied cattle (for rearing 468 head cattle 12636 poultry birds & shed as the input source of bio-gas plant and make the dwellers self-help entrepreneurship;

-To install community-based biogas plants as a source of renewable energy;

-To install solar power system as the alternate electric source and ensure rainwater

harvesting facilities and also recycling wastewater system;

-Production of organic manure for better waste management as well as improvement of soil health and develop the multistoried rural shelter as a zero waste society.

4.1. Project Beneficiary Selection Strategy

Project beneficiaries or citizens who apply for rural township project flats are selected based on the following criteria:

- 1) At First, land sellers in favor of the project;
- 2) Applicants of project villages (various classes, professions, brave freedom fighters, remittance senders);
- 3) If there are not enough application forms for the project village, the applicant of the nearest villages around it;
- 4) After that, if there are surplus flats, then the applicants of affiliated unions, upazillas, districts, and divisions;
- 5) Applicants who are residents of project villages/ unions/ upazillas/ districts whose family members send remittances to the family;
- 6) Freedom fighter's family: Village/Union/Upazilla/District/Division;
- 7) Residents of the entire district/division/Bangladesh. (RDA,2022)

5. Description And Number Of Different Types Of Flats In Rural Townships:

5.1. Project-wise flat types and details

Considering the socio-economic status of the people of the villages, there are plans to construct four types of flats in the rural townships, i.e. A, B, C and D type flats. So that starting from the low-income people of the village to high-income people can get the opportunity to buy flats. The information about the details, size and area of the flats is given below:

Table:1

Types of flat	Number	Net Area (Sq. Ft.)	Gross Area (Sq. Ft.)
A- type	64	915	1383
B-type	96	710	1073
C-type	32	460	696
D-type	80	365	552
Total	272		

Source: (source: RDA, 2022)

Table 2: Other Facilities in the building

Type	Number	Unit Gross Area
Shops	2	331.21
Book and Stationery	1	331.21
Tailor	1	331.21
Salon	1	331.21
Pharmacy	1	331.21
Medical Center	1	662.42
Internet and Computer Lab	1	331.21
Library	1	331.21
Community Center	2	1104.03
Mosque	2	662.42

Source: (RDA, 2022)

5.2. Project implementation strategy:

A rural township housing society was formed in each project area. The idea was like that 'The rural township housing society should have a constitution and should be governed in accordance with the constitution. Subject to the payment of the total price of the flat by the members living in the flat, each member would get ownership through the registry deed at his own expense in proportion to the flat and available space. Flat key will be handed over after advance payment of 30% flat construction cost as down payment. After handing over the keys, the remaining 70% should be paid within maximum 15 years with only 5% service charge (simple interest).'

The project is an ambitious dream project of the Government of Bangladesh where 272 families will live together in low-cost multi-storied buildings with land management. Besides, every resident beneficiary will have access to civic facilities such as prayer, community center, computer and internet facilities, training, and loans. A study by the Rural Development Academy, Bogra shows that a total of 29 acres of agricultural land will be saved, including about 13 acres for house construction and 16 acres for connecting roads, if 272 families join together. Also, the construction cost of 6.15 km electric line and about 8 km water supply line would be saved. Also, waste collection and management would be easier due to

cohabitation (RDA,2022).

5.3. Building Materials used in the project:

As the project is a practical research project, apart from the traditional technology, there are Ferro cement technology slabs to reduce the self-load of the building and increase its durability, keeping the temperature bearable through the double roof with sandwich panels on the top floor, the possibility of using solar power as alternative electricity and the possibility of fire extinguishers by storing rainwater and the system of circulating excess underground water. The project has reduced the possibility of a loss of agricultural land fertility due to the construction of rural townships by using eco-friendly Hollow Block instead of clay bricks.

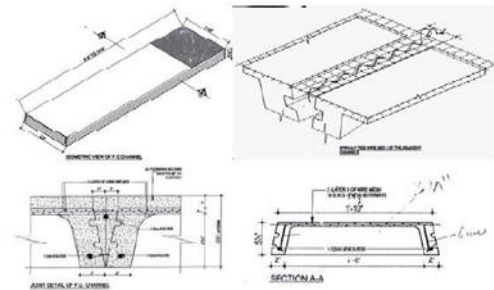
Low-cost technology used in this project:

Ferro Cement pre-cast U-shape channel:

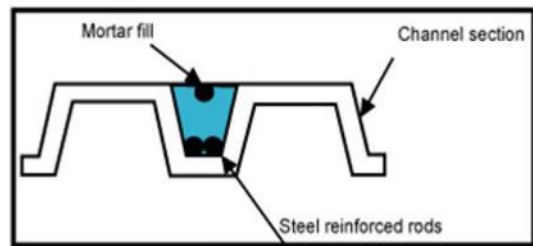
1. Maximum channel length for a floor or roof slab is 12'-6";
2. The use of steel shutters with a minimum cement content corresponds to a 1:2 mixing ratio for conforming cement;
3. The highest calibre coarse sand (F.M.2.2-2.8)
4. reinforced cement concrete works with two layers of 18 BWG galvanised wire mesh with a 12 mm c/c gap in each direction;
5. well-graded stone chips that are 12 mm down and fine sand (F.M.1.2) mortar (1.4) for finishing.

5.4. EVG 3D Construction System

It is a construction system that is both affordable and offers a tried-and-true construction technique using modular panels with great load-bearing strength. The EVG 3D Construction System is made up of panels with an EPS core and a layer of galvanized mesh on either side that are joined together by diagonal galvanized steel trusses that travel through the EPS core. To create a Sandwich-style building, the panels are linked in the desired configuration on site and sprayed with concrete. A type of lightweight concrete known as CLC—also referred to as foam concrete—is created in the same way as regular concrete under ambient circumstances. CLC Blocks are cement-bonded products created by mixing a cement slurry. Foam is created by injecting a stable, already-formed substance that is produced locally into this slurry.



Slab design of Ferro-cement



Pre-cast Ferro-cement Channel

Figure 1: EVG 3D Construction System panels. (source: RDA, 2022)



Figure 2: Cellular Light Weight Concrete (CLC) (source: Field survey, 2022)



Figure 3: Entry gate(Palli Janapad ,Bogura)
(source: Field survey, 2022)



Figure 6: Spaces for Shops and Community center at ground level and first level



Figure 4: 4 storeyed under-construction building of Palli Janapad



Figure 7: Central courtyard (view from the corridor)



Figure 5: Long corridor to pass through the units



Figure 8: Expansion joint among column



Figure 9: Sandwich panel



Figure 10: Frame for the pitched roof at the top
(Source: Site Survey by Author, 2022)

6. Critical Review Of The Project

This project has related all concepts of rural livelihood:

1. Financial perspective: This is a mega project for the rural community, so there are many financial benefits for the rural community. Many Investor Companies and banks will help investors for investing there, so day by day this type of housing will be developed. However, unplanned growth of this type of community can create chaos instead of saving resources.

2. Environmental aspect: This project used natural rural land near the growth center and makes a new settlement of houses. In rural areas, people expand their house settlement by increasing population density in the family. So lots of agriculturally productive lands are lost for this type of unplanned settlement of housing (One family in one land which is a horizontal settlement). In this project, lots of families are living together. So agricultural productive lands are saved. However, this project can be built by filling water bodies, green and open spaces and agricultural land as well. There are a few certainties to becoming abandoned in some units which cannot be removed. Residents would destroy the ecology as the housing is not built according to the village culture. If this type of project will be replicated without revising the design, the amount of hard paved surfaces will be increasing, the underground water level will be lower day by day and the overall ecosystem will be under threat.

3. Socio-cultural aspect: This project will have an impact on socio-cultural aspects. Lots of educated people will start to live there, thus there will be created a society of mixed-income groups which will improve social networks whereby poor people expand their job-search and acquisition networks. Social inequity among various income groups will be diminished.

The leadership powers of people will be increasing and people will be respecting the norms and rules. Therefore, they will get benefit from the social sustainability of mixed-income housing. The large playground might help to interact each other. Nevertheless, the enclosed courtyard would be better if it has a connection with the playground. There is a probability that so many other amenities like schools, colleges, Bazar, mosques, etc. will be emerged in near future to provide opportunities to

these residents which will also be used by the surrounding people.

4. Physical infrastructure: This multi-level built form provided with water supply, electricity, rainwater harvesting system, solar panel, etc. are many modern tools and technologies which are used in this project are important physical infrastructure. Rural people will get accustomed to this type of technology.

6. Rural-urban linkage: This project is focused on rural-urban linkage. This type of project tries to enjoy a modern lifestyle for rural people with all types of modern utility services. The location of this project is near a growth center in rural area, so it is a rural-urban linkage getaway through the growth center. This is a place where the rural-urban flows are occurring (product flow, raw material flow, information flow, technology flow, movement of people, improving transportation system etc.). Thus, new types of spaces will be emerged which characteristics would be a mixed essence of rural –urban.

7. Conclusion

Palli Janapad is one of the brand new ideas for the rural people of Bangladesh. Their dream of having a taste of urban life will come true after launching the project fully. However, if the architectural design and planning guidelines would not in place, it will ruin the rural ecosystem (socio-cultural and environmental) completely. From the architectural perspective, the overall design should be in consideration of socio-cultural issues like rural lifestyles, activity patterns, their cultural activities. These considerations are totally missing in this project. There should be added terrace spaces for vertical vegetable gardening, amphitheater-type spaces under a large tree for cultural activities, and so on. In addition, all of the building materials should be sustainable and eco-friendly. More research should be conducted to use bamboo, mud, etc. as the main components of buildings as these are sustainable building materials. Large corridor spaces should be broken as these spaces increase the unnecessary and boring circulation spaces. Kitchens besides corridors may hamper the privacy of the consisted families because in Bangladesh cooking pattern is different and the smell of spices can hamper the people who use the circulation. The central courtyard should have a tiny connection to the large field at least, otherwise, the space becomes congested. There should be more innovative design ideas connecting upper-level community space to the central courtyard. Last but not the least, the space should be more affordable so that the root-level poor farmers who are the majority of the rural area can avail of the spaces otherwise it would be like patronizing the upper-class level and not giving equal priority to all of the income groups of people. Building cattle farms and bio-gas plants which were deducted previously because of budget constraints should be added to grow a sustainable community. A properly structured project both from architecture and planning perspectives would be a

successful project which has so many positive aspects for the country by reducing migration and creating stress-free urbanization. Government should have a proper plan about the land-use planning to plan the residential and farmland properly to execute this type of housing including utilizing organic resources like bio-gas plants, vegetation, etc. otherwise, people may build many more apartment-type vague housing buildings which would ruin the rural atmosphere.

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