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DMDP as a Tool to Safeguard the Flood Flow Zones from Unrestrained Development

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Abstract

Dhaka Metropolitan Development Plan (DMDP) has been prepared finally. Though, it consumed a lot of time, it is now the only widespread policy paper to control the development in DMDP area. From the experience of physical development of recent past it is evident that, some land grabbers have taken every chance to develop Dhaka city's hinterlands most of whose were earmarked as agricultural area or flood flow zone in Structure Plan. Now we have policy paper to protect them from unrestrained development. Moreover, this plan package holds some policies up as National Environmental Policy, 1992; National Land Policy, 2001; National Agricultural Policy, 1999; National Water Policy, 1999; National Fisheries Policy, 1998 etc. Now, to ensure a healthy urban environment in Dhaka and its surroundings, government should take every step to implement it at the ground level and at the same time, will stand by the policies that government prepared formerly.

Introduction

Dhaka Metropolitan Development Plan (DMDP) - the first policy plan for metro Dhaka is basically a three tier development control and growth management mechanism for Dhaka City and adjoining areas including its hinterlands. Rajdhani Unnyan Kartripakkha (RAJUK) started to prepare it in 1990s, when Dhaka was expanding at a huge rate. Population was increasing and the pressure on land did so. Before the independence of Bangladesh, RAJUK (Former DIT) took this initiative for the first time and prepared a master plan. As master plan is so much rigid and it could not hold the uncertainties of upcoming future, the plan failed to achieve its goal. This is why RAJUK took up the task of preparing a more flexible plan, The Dhaka Metropolitan Development Plan. This paper reviews the strength of DMDP as a tool to protect the flood flow zones.

Components of DMDP

DMDP is a multisectoral development plan comprised of Structure plan, Urban Area Plan and Detailed Area Plan. The project's planning component is presented as a package of plan outputs which collectively address Dhaka's urban planning issues at three geographic levels; sub-regional, urban and sub-urban. The Dhaka Metropolitan Development Plan is therefore, composed of the three following components:

- Structure Plan;

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- Urban Area Plan; and
- Detailed Area Plans.

Structure Plan identifies the order of magnitude and direction of anticipation of urban growth. It defines a broad set of policies in order to achieve the overall plan objectives and states that the strategies shall be subject to review preferably every five years interval. The plan is open ended, providing a broad policy framework for Urban Area Plan (UAP) and long-term development programs.

Urban Area Plan is a mid-term strategy for the 10 year period for the development of urban area and defines the geographic boundaries of the extent of area that covers during the interim plan period. Besides, it includes UAP maps delineating various landuse management zones. The UAP is primarily intended to be gradually superseded various SPZ (spatial Planning Zone) plans which covers specific geographic sub areas of Dhaka.

The Detailed Area Plan provides more detailed planning proposals for specific sub-areas of Dhaka. Primarily it was declared that they do not initially cover the entire Dhaka Structure Plan area (590 Sq. mile). While all sub-areas will eventually require a DAP, only priority areas will be dealt with initially. The detailed area plans consist of reports and maps at 1:15,000 scales (or larger as appropriate) with supporting documents. They may include the area of one or more Strategic Planning Zone (SPZ), or parts of several SPZs, depending on circumstances. Until a Detailed Area Plan is prepared for a sub-area, however, land use management functions will be exercised through the policies, guidelines, and rules found in the Structure Plan and Urban Area Plan.

Concepts of Flood Flow Zone

The rising of a water body and its overflowing onto normally dry land is called flood. Annual place of inundations are thus flood flow zones. A river in its flow regime maintains a width within which the flows occur during flooding time. Main flood flow zone is the cross sectional area of a river that carries the dominant flood flow whereas sub flood flow zone is that area which conveys the flood water only during high tide and storms (RAJUK, 2011).

Flood Flow Zones are designed for control the area where the flood flows are running over the flood time or at a specified time of a year. Land development within the designated flood plain areas requires control to avoid obstruction to flood flow, which might otherwise result in adverse hydraulic effects like rise of flood water levels and change in flow direction as well as adverse environmental effects like hampering ecological biodiversity.

Concepts of Development Control

Development Control is the process to make best use of the resources of land to achieve sustainable products of food as well as best possible output in the future. It covers all activities concerned with the management of land as a resource both from an environmental and from an economic perspective. It includes farming, mineral extraction, property and estate management and physical planning of towns and countryside (Acharya, 2009). It embraces such matters as:

- Property conveyance including decisions on mortgages and investment

- Property assessment and valuation
- Development and management of utilities and services
- Management of land resources such as forestry, soils, or agriculture
- Formation and implementation of land use policies
- Environmental impact assessment and
- Monitoring of all activities on land that effect the best use of that land.

Development Control can be defined as the process of managing the use and development (in both urban and rural settings) of land resources in a sustainable way. Land resources are used for a variety of purposes which interact and may compete with one another; therefore, it is desirable to plan and manage all uses in an integrated manner.

Although Land is part of man's natural heritage, access to land needs to be controlled by ownership patterns. It is divided for administrative and economic purposes. It is used and transformed in a myriad ways (Thomson & Neal, 2000). This is the reason why development control is so important for all of the associated professional groups.

Land is the scarcest commodity since it is fixed in supply having ever increasing demand with the population influx. In Dhaka the scenario is even worse due to unplanned and uncontrolled development race.

Importance of Flood Flow Zone

Flood Flow Zones within the DMDP area play a vital role for environmental balance as well as minimizing the flood risk in urban areas. It provides water both for agricultural irrigation and urban uses also. These areas also have agricultural value which ultimately ties with our food security. In DMDP, the flood flow zones are demarcated as special area and special attention has been given to protect these areas from different encroachment for our present and future generations. The importance of this zone is elaborated below.

- Dhaka's water level during monsoon is rising throughout last consecutive years. At the same time, the hinterlands that were earmarked as main flood flow zone or sub flood flow zone are being filled up. If the zones are filled up, it will heighten the level of flood water. So to protect the capital, flood flow zones are very important.
- These zones are crucially important for protecting the ecological biodiversity as well as the aquatic species like various kinds of fishes and microorganisms.
- The flood flow zones are the sources of food grain supply to the city. Our food security will be hampered if these zones are diminished.
- The area holds a variety of environmental beauty. It is an important issue of concern in this city of blight.
- Ground water table is recharged through these areas during the monsoon. Ground water level will be lowered in the absence of this zone.
- The intensity of flood is increased in the place next to the filled up area.
- If the area is filled, the water as well as silt cannot be flown over the surrounding area that results decrease in moisture and fertility of the land resulting in less agricultural outputs.

- Filling flood flow zones result in diversion of main river flow. In some cases flow becomes zigzag. This causes in erosion of riverfront that results an unacceptable economic situation.
- Some areas may face water logging if flood flows (actually, surrounding flood flows) are filled up.
- Lifecycle of fishes as well as other aquatic lives are disturbed in such types of action that may result in decrease of fish production. Furthermore, flood flow zones are mostly navigable during monsoon that will be disturbed if the areas are filled up.

Flood Flow Zones in DMDP

In DMDP, areas around the built up city has been earmarked as flood flow zone. The 5 (five) river basins of Buriganga, Sitalakkhya, Turag, Balu and Dhewleswari has been earmarked as flood flow zone that includes a large area of Baktaboli, Keraniganj, Ashulia, Savar, Rupganj, Baria, Dhitpur, Murapara and Basulia. Though a huge development pressure has been seen here since 1990s, because of population growth and low price of land, these areas have been demarked as "no development" zone.

Policy Regarding Flood Flow Zones

There are a variety of rules and regulations in DMDP regarding the flood flow zones. Structure Plan, Urban Area Plan and Detailed Area Plan separately gave policies and regulations regarding the flood flow zones. Those were mainly designed to reduce the adverse hydraulic effects, the risk to human life and economic damage.

Structure Plan Policy RS\3 for Flood Flow Zone: Land development, within the designated flood plain areas of the DMDP Structure plan, will be controlled in order to avoid obstructions to flood flow, which might otherwise result in adverse hydraulic effects, such as, the rise of flood water levels and changes of flow direction.

JICA in its Report on FAP-8A proposals identified main and sub flood flow zones. The DMDP Structure Plan adopts the same division, whereby development restrictions are more severe in the main flood flow zone. Proposed controls are as follows:

Main Flood Flow Zone

Land development for residential, commercial and industrial development, including raising the level of land, via land filling, will be strictly prohibited. Permitted uses, provided that they cause no adverse hydraulic effect will be:

- Agriculture;
- Dry season recreation facilities;
- Ferry terminals; and
- Excavation of mineral deposits, including dry season brick works.

Causeways for roads or railways will be permitted, subject to detailed geological surveys being undertaken and on condition that they are built with culverts sufficient to allow for unimpeded flood flow.

Sub Flood Flow Zone

Development compatible with the rural nature of these mainly rice growing areas, will be permitted on condition that the:

- Structures are built on stilts, or on land raised above design flood water level;
- Alignment of structures and raised land to be designed so as not to disturb flood flow;

Urban Area Plan came up with the following policies and regulations regarding the Flood Flow Zones:

SPZ 17: Flood Zone West (Development Management Report: Part I)

- The area should be enabled to function properly as a flood plain and a basic rural/pisciculture zone.
- All the development permits issued for the development of housing should be withdrawn and no new permits be allowed to maintain the nature of the zone.
- Conversion of land from rural to urban should be regulated strictly in this zone.

SPZ 18: Dhaleshwari Flood Zone South

- The area is a major flood zone, as such to avoid negative effects; flood water flow should not be disturbed.
- Even at this stage, Container Port should be relocated in the DND Triangle on the opposite bank of Buriganga river.
- The RAJUK scheme and the Cantonment should not be realized and the area should be allowed to maintain its present character.

Development Management

The flood flow zones were determined by FAP 8A studies, and lie largely outside the present urban area. The study recommended that development in low-lying flood plain areas be restricted, since it could obstruct natural flood flow. Such restriction would cause a rise in water level and changes in flood direction affecting the entire metropolitan area.

In the Main Flood Flow Zone, now mostly being agricultural land, urban development should be prohibited. Only development having no adverse hydraulic effects should be permitted. Such development includes:

- Agriculture
- Open space for recreation
- Ferry terminals
- Brickyards

The Sub-Flood Flow Zone is less affected by flood flow. It includes village and homestead areas. Development in this zone should only be allowed provided that:

- The developed land is raised more than the design flood water level;

- The slope of such land is sufficiently gentle to prevent slope failure and is protected from erosion;
- Structure orientation is designed to minimize flood flow obstruction;
- Floor elevation of structure themselves are sufficiently strong to withstand flood damage.

For both types of flood zones, it is important that laws preventing land fill soon come into force, otherwise, control of development in these zones will be very difficult, and the effectiveness of flood protection measures will be seriously compromised.

DMDP as a Tool of Development Control

Strength of DMDP to safeguard flood flow zones

DMDP can be an excellent tool to control the development in flood flow zones. Here, it is to be mentioned that in Structure Plan and Urban Area Plan, there are notions of two flood flow zones, but in DAP, there is a single flood flow zone. The regulation or control in sub-flood flow zone is less strict than the main flood flow zone in both structure plan and urban area plan. The land grabbers took this opportunity to develop in sub-flood zones around the city (additionally, flood flow zones were not earmarked well). As the regulation of main flood flow zone is more strict, DAP suggested similar restrictions in both of the flood flow zones and thus the two zones of structure plan and urban area plan became one in DAP. This made much more strict restriction on development within the area.

In DMDP, the recommended policies that are given ever, were intended to promote an uninterrupted flood flow over the zones and to do this, structure plan in its policy map earmarked an area of approximately 71995.41 (9.14% of total DMDP Area) acres of land as main flood flow zone and 29971.29 acres (21.96% of total DMDP Area) of land as sub-flood flow zone. The composition of land use of DMDP is given here for an instance.

Table 1: Land use proposed in the Structure Plan.

Sl. No.	Landuse	Quantity of Land		
		Acre	Hectare	Percentage
1	Established Urban Area	47531.79	19235.85	14.50
2	Sub Flood Flow Areas	29971.29	12129.22	9.14
3	Main Flood Flow Areas	71995.41	29136.14	21.96
4	Agricultural High Value Areas	47391.62	19179.13	14.46
5	Agricultural Areas	49470.47	20020.42	15.09
6	New Urban Land Development	23258.02	9412.39	7.09
7	Peripheral Urban Development	25929.01	10493.33	7.91
8	Waterbody	8886.55	3596.34	2.71
9	Others	23403.95	9471.45	7.13
Total		327838.10	132674.26	100.00

Source: DMDP Composite Policies Map, RAJUK, 1997.

In DAP too, the area is given due importance obviously, but it declared a less area of 74566.01 acres (20.60% of total DMDP area) of land as Flood Flow Zone (It is to be mentioned that Rural Homestead Zone and Agricultural Zone are situated within this and this zone is demarked as no further invasion zone in DAP as these are environmentally and economically crucial areas). The composition of landuse declared in DAP is as below:

Table 2: Land use proposed in the DAP.

Landuse	Acres	Hectares	Percentage (%)
Agricultural Zone	81415.91	32945.02	22.50
Flood Flow Zone	74566.01	30173.20	20.60
Industrial Zone	5962.34	2412.67	1.65
Institutional Zone	5845.71	2365.47	1.62
Mixed Use	12715.65	5145.40	3.51
Open Space	3273.43	1324.60	0.90
Overlay Zone	14943.44	6046.88	4.13
Road Network, Transportation & Communication	30939.37	12519.64	8.55
Rural Settlement Zone	35937.55	14542.16	9.93
Urban Residential Zone	66539.56	26925.29	18.39
Water Retention Area	5521.73	2234.37	1.53
Waterbody	20716.61	8382.99	5.72
Others	3515.96	1422.74	0.97
Total	361893.3	146440.40	100.00

Source: Composite Map, DAP, RAJUK, 2011.

If we compare, in contrast to 30.53% of land in DAP, Structure Plan declared 31.10% of entire land roughly (the calculation is not so simple, in flood flows we may find Road Network, Transportation & Communication, Waterbody, Overlay Zone etc. besides Rural Settlement Zone) as flood flow zone.

In UAP, the use regulations that are accommodated, if followed strictly, one cannot convert the rural characteristics of flood flow zone into urban or others. As UAP is superseded by DAP, now, the use regulation of DAP will take place and recommended policies of DMDP, the affirmed use permissions of Structure Plan and DAP is very strict to safeguard the flood flow zone. As for example, nothing is permitted in flood flow zone which are associated with any kind of hydrological change of that area.

Through this plan (DMDP), RAJUK will be able to satisfy the aims of the following policies related to environmental conservation, wetland protection and sustainable development.

i. National Environmental Policy, 1992[1]

The Environmental Policy, 1992 gave a lot of importance to protect waterbodies and environment. It states in the part of Policies for Housing and Urbanization that

- In every planning, Environmental Consideration will be given due priority,
- Controlling such kind of Housing and Urbanization that has negative impact over environment
- Waterbody will be given priority in enhancing the beautification of cities.

ii. National Land Policy, 2001

One of the objectives of National Land Policy, 2001 was to ensure maximum use of land resource according to the natural difference by introducing Zoning and controlling the process of unplanned Residential Expansion and Industrial placement rationally. Food production has been given highest priority in using the land resource in this policy.

Creation of a new Zoning law was given a great priority in this policy but in the landuse classification, it didn't give due emphasis on the flood flow zones though a great amount of land in our country falls under this classification. It rightly addressed the incidence of land fill here and there but regarding this phenomenon it suggested one thing only- the local administration to control this.

iii. National Agricultural Policy, 1999

This policy aimed at Increasing production and supplies of more nutritious food crops and thereby ensuring food security, Preserving existing bio-diversity and Taking necessary steps to ensure environmental protection as well as 'environment- friendly sustainable agriculture'.

Following steps were suggested to ensure planned utilization of land for crop production:

- Land zoning programme will be taken up by the Soil Resources Development Institute (SRDI) on a priority basis. Integrated approach of SRDI will be further strengthened for this purpose.
- To ensure maximum utilization of land, bottom up planning through people's participation and its implementation will be started from the mouza or village level.
- Fertile agricultural land is going out of cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfield, etc. Appropriate measures will be taken to stop this trend in the light of the Land Policy of the government.

iv. National Water Policy, 1999

National Water policy, 1999 in its every part emphasized usage of water and the water basin management very seriously as most of the part of our country is situated in the area.

v. National Fisheries Policy, 1998

Fisheries policy, too, aimed at maintaining ecological balance, conserve biodiversity, ensure public health provide recreational facilities and obviously, at increasing the total amount of fish production.

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[1] For the policies, visit government websites of concerned ministries, i.e., for Environmental Policy, visit MoEF's website, for Land Policy, visit Ministry of Land's website etc.

Besides, RAJUK has an additional act to protect the wetlands and to execute the policies of the plan in the field level named *Wetland Protection Act, 2000.*

Limitations of DMDP to Safeguard Flood Flow Zones

The applicability of DMDP decreased at a great extent, because of consuming more time for completion. Before DAP, as the flood plains were not earmarked at the ground level, some of the developers (both large and small scale, even individuals) filled the low lands of flood plains finding this gap in Structure Plan and Urban Area Plan.

Structure Plan and Urban Area Plan suggested that the development of rural nature could be done in flood flow zone, which is not a good policy. If we spread our development or give the opportunity to develop in flood flow zone (i.e. on flood plain and agricultural land) consecutively, after some year we will lose our very valuable flood flow zone as well as agricultural land.

In DMDP, the flood flow zones are earmarked according to FAP study but DMDP team did not conduct detailed study on it. In some cases DMDP is conflicting with Dacca Master Plan 1959. As for example, Dacca Master Plan'59 suggested raising the land of Keraniganj over the flood level, but DMDP earmarked the area as Flood Flow Zone (DIT, 1959).

Sometimes, such types of land are earmarked as flood flow zone in Structure Plan that had been grown as a growth centre in the past. As for example, Kashimpur, which is earmarked as flood flow zone in Structure Plan was a growth centre in that time.

Conclusion

As the first two tiers of the DMDP are policy plans, it is very difficult to control Dhaka's development effectively. This has resulted in the sprawl development and development in the areas of drainage corridor, flood plain and agricultural land. Wherein, it was expected that development would be directed towards preferred areas of urban expansion. DAP is going to provide the necessary legal instrument to steer such development according to the guidelines provided in the Structure Plan and the Urban Area Plan. It will safeguard the Flood Flow Zones from further deterioration. There is no alternative to the application of the plan in letter and spirit and as Planning is a continuous process, there are scopes for reviewing and furnishing the plans from the mistakes and weaknesses of the previous plans.

References

Acharya, B. R. 2009. Necessity of Effective Land Management for Sustainable Real Estate Market in Nepal. Retrieved September 12, 2011, from Federation Internationale des Geometres Web site: www.fig.net/pub/fig2009/papers/ts05a/ts05a_acharya_3352.pdf

DIT, 1959. Master Plan, 1959. Dhaka: Dhaka Improvement Trust.

RAJUK, 1997. Dhaka Metropolitan Development Plan (DMDP), Volume-1. Dhaka: Rajdhani Unnayan Kartripakkha (RAJUK).

RAJUK, 2011. Preparation of Detailed Area Plan for Dhaka Metropolitan Development Plan (DMDP) Area, Volume-1. Dhaka: Rajdhani Unnayan Kartripakkha.

Thomson, P. J. and Neal, H. V. 2000. Land Management Planning and Implementation Pursuant to Wetland Restoration in a Regionally Significant Watershed in Polk County, Florida. Florida: Greater Orlando Aviation Authority.