

CHAPTER 16 LAND RECLAMATION

Objectives

After studying this chapter, students should be able to:

- define the term ‘land reclamation’.
- describe the various methods applied in land reclamation.
- state the importance of land reclamation and
- identify the various problems associated with land reclamation and provide solutions to them.

16.1 Definition

Land reclamation is a series of attempts and efforts aimed at returning unused and abandoned lands such as wetlands, mine fields, old factory sites, wilderness, etc back to their original state. It is a set of activities aimed at putting unused or abandoned lands into more productive uses and restoring such lands back to their original state where they can be used for more profitable human activities.

There are several reasons for land reclamation depending on those originating it and where the activity is to be executed. However, on a general note, land reclamation is usually executed for the following reasons:

- (i) The need to create more land space that will accommodate some human activities which hitherto were not in existence. For instance, a disused factory site can be rehabilitated to create more land space

for more industries to be established so as to promote diversification.

- (ii) The desire to alter the natural characteristics of an area in order to make it more conducive for human habitation. The reclamation of land from sea environment or coastal waters is a ready example. Here, land is being reclaimed in order to create estates where buildings can be raised for residential purposes.
- (iii) Restoration of deficient areas back to their natural state. Here, the motive is to restore places that have been negatively invaded or interfered with by man through such activities as indiscriminate deforestation which makes an area prone to some environmental hazards. Replanting of trees is a direct way of returning such a place back to its original state. Closely related to this is the creation of conservation areas or protected areas which are special areas where animal and plant species found in the area are protected from human interference in the form of lumbering, agriculture, hunting, etc as a way of preserving the living organisms from extinction or imminent danger.
- (iv) A direct step towards resettling people who have been displaced from their original homelands due to the ravages of war, epidemics, civil unrest, mining activities, dam construction, etc.
- (v) A concerted effort at decongesting heavily populated and urbanised settlements where living conditions are becoming deplorable and devastating. These efforts have resulted in the construction of special settlements called “NEW TOWNS” which are aimed at relieving congested settlements of excess population. These towns are modern and fitted with relevant public infrastructures such as roads, power supply, portable water, hospitals, etc. These

settlements are founded close to big cities on physical areas that have been left fallow for a long period of time.

6.2 Methods

There are several methods for reclaiming land either from an abandoned state or for productive uses. However, the most common ones include:

(a) Afforestation

This is a term covering all attempts and activities aimed at conserving forests in a place that has either suffered deforestation, (that is, indiscriminate clearing of forests for a variety of purposes such as lumbering, farming, mining, construction - road, buildings) or being affected by natural hazards such as droughts, desert encroachments, etc.

Afforestation may consist of the following measures:

- (i) Mass publicity against indiscriminate forest destruction and need to plant trees in places that are without.
- (ii) Replanting of trees and grasses immediately they have been exploited (felled) for economic purposes.
- (iii) Enactment and enforcement of legislations banning or prohibiting tree felling and imposing limits on the height of tree to be felled.
- (iv) The use of forest guards and security personnel to forestall deforestation, poaching (indiscriminate hunting and killing of forest animals/games) and illegal hunting.
- (v) Declaration of certain forests as forest reserves or protected areas where gaming or poaching and felling of tress are highly prohibited or outlawed.
- (vi) Subsidizing the cost of tree seedlings as a way of encouraging afforestation.
- (vii) Sponsoring and initiating research into forest activities.

(b) Construction of Physical Barriers

Physical barriers are needed in protecting the reclaimed land from the incursion of sea waves and river flooding or to serve as wind breakers in areas reclaimed from desert encroachment. Land reclaimed from the sea or riverine areas can be protected by constructing big walls around them or building physical barriers such as groynes or breakwater that will drastically reduce the velocity of sea waves and river flows. Wind breakers are variety of trees built against the direction of wind in places reclaimed from wind erosion and deserts. The trees will not only break the speed of the wind but the root of the trees will help consolidate the soil from being moved easily by the wind.

(c) Sand Filling

This is a measure adopted when land is being reclaimed from wetlands such as riverine areas, coastlands or disused mine fields. This method involves pouring sand through hydraulic process into waterlogged areas such that the water is forced to recede back. By this, a lot of land space is secured for human use. This process is also used in rehabilitating 'bad lands' that is, areas that have suffered from severe erosion and drought. Through it, soil fertility is restored and enough land space is made available, whereby several human activities can be supported. It is a complex activity that is, time consuming, physically-draining and expensive. Equally, it is a capital-intensive project which cannot be embarked on just for its sake. A lot of planning, resources and intensive monitoring is needed for it to be successful.

(d) Construction of Drainage Channels

This is a method that is adopted in reclaiming land from water-logged conditions. The drains are special outlets in form of trenches, gutters through which excess water is drained from the reclaimed land. Through these channels, water is allowed to flow freely and prevented from storing during heavy storms. This will allow the land to be dry so as to encourage human habitation. It is equally an expensive venture that is based on modern technology and is capital-intensive.

(e) Control of Erosion Heads

This involves the application of modern methods of erosion control in land reclaimed either from the sea or riverine areas. This measure includes:

- (i) Identification of place prone to intensive erosion in the reclaimed area.
- (ii) Installation of physical structures that will cause progradation, that is, the raising and retention of soil materials on the land surface.
- (iii) Deposition of sand materials got from dredging activities along the reclaimed area to increase the ground level.
- (iv) Planting of cover vegetation such as cover crops, marram grasses (along coastlines), etc to help hold the loose soil particles.
- (v) Construction of drainage trenches to allow water to flow freely.

(f) Construction of Embankments

These are raised concrete blocks which help in reducing the intrusions of river tides and sea water into the reclaimed land. This is necessary in order to prevent flooding in the area and help preserve lives and properties. It is a physical structure that is either constructed alone or constructed to complement the actions of groynes and breakwaters. It is an expensive method as it involves the use of concrete materials and heavy metals.

(g) Slum Clearance

This involves the destruction of low quality settlements such as slums ghettos, etc., so as to create enough land space for creating new settlements where improved and quality public infrastructures are provided, and to help decongest highly populated settlements.

16.3 Importance of Land Reclamation

Land reclamation is a physical venture that confers a lot of benefits, some of which include:

1. It is a means of recovering resources within man's physical environment which had either been lost or by conserving the existing ones.
2. It provides a wide range of opportunities for man to interact and exploit positively the benefits offered by the immediate environment.
3. It allows man to overcome difficulties and resistances posed by his environment and through that, take adequate control of the environment to his advantage. For instance, land reclamation from sea or water bodies allows man to control effectively the ravages of sea and river erosion and at the same time have more land space for other activities.
4. Land reclamation provides large avenue for man to acquire more wealth in terms of revenue for the various activities he carries out within the reclaimed land. For example, Victoria Island in Lagos is largely a reclaimed area that is noted for several commercial and financial activities that has provided more revenue for the Nigerian government in the last five decades.
5. It allows man the opportunity to combat and reduce maximally the negative effects of some environmental hazards such as erosion, deforestation, etc.

6. It allows for the effective planning, management, allocation and use of resources available in the reclaimed areas since they are within man's direct control and supervision.

16.4 Problems

Land reclamation is accompanied by some problems which include:

1. It is an expensive venture that requires a lot of capital and technology which most developing countries may not readily afford.
2. Its execution often results in loss of jobs or sources of livelihood especially where it involves population displacement such as slum clearance and other physical works such as erosion, control or urban renewal schemes that may have to do with resettling people from their original homelands to new places.
3. It may result in the abandonment of traditional occupations where people drop their original vocations and compete for white collar jobs in the event of the creation of new towns with modern facilities. This happens when people migrate from rural areas to these towns for employment.
4. It could promote the growth of slums and degraded areas where the reclaimed land is not properly planned and administered. For example, Maroko near Victoria Island, Lagos in the eighties and nineties, became a slum due to poor physical planning and had to be renewed subsequently..
5. It could encourage the spread of epidemics and certain diseases that result from the mixing of people from different social classes. For instance, the development of Abuja, Nigeria encouraged the practice of social vices such as prostitution and the spread of HIV and other diseases.

6. It could result to the altering of the existing natural ecosystems and the destruction of several organisms especially when reclaimed land is used for residential and industrial purposes.
7. It could promote environmental pollution due to the establishment of industries and production outfits all of which may emit poisonous gases during their operations that are detrimental to human health.
8. It could result in population displacement especially with activities such as the construction of dams and other public infrastructures that are likely to consume much land space.
9. It often results in deteriorating environmental quality as it encourages the death of living organisms and the spread of epidemics and diseases.

16.5 Solutions

1. In view of its huge financial implication, land reclamation schemes are better funded with the active involvement of private investors and the government. Current realities have shown that it is not a venture that can be shouldered alone by the government.
2. Members of the public especially beneficiaries of the reclamation schemes should be involved in the formulation and execution of the projects especially where it will involve the resettlement of the people. By so doing, government will have succeeded in carrying the people along. Efforts by the Lagos State Government to build an 'Atlantic City' along the shores of the Lagos Coastline in recent years has tried to involve members of the public in its implementation.
3. Latest technology and best international practices should be applied in the execution of the projects so that they will last for a long time and can be properly maintained.

4. In executing the reclamation projects, it is best that effort be made to protect the living organisms in such places and help ensure the stability of the prevailing ecosystem.
5. Reclamation projects should be executed efficiently and should not be abandoned mid-stream.
6. Qualified and skilled manpower such as engineers, architects, planners, environmentalists and other related professionals should be actively involved in the conception and execution of the reclamation projects in order to ensure speedy completion and effective maintenance.
7. There should be proper monitoring and evaluation during the project execution and after, as this will help reduce wastes, inefficiency and corruption to the bearest minimum all of which are capable of hampering the successful completion of the projects.

Summary

- Land reclamation are activities and efforts aimed at returning unused or abandoned land to its original state and made more productive for man's use.
- Land reclamation is based on the need to create more land for more human activities which are hitherto not in existence, restore deficient land into profitable use, resettling people who have been displaced from their original homeland and help decongest densely populated settlements.
- Methods of land reclamation include: afforestation, construction of physical barriers to prevent ocean or sea incursion, sand filling, embarkment, erosion control, construction of drainage channels, etc.
- Land reclamation confers some benefits such as better interaction between man and his environment. It is a means of providing man

with lost or hidden resources, wealth acquisition, etc.

- Land reclamation is faced with several problems such as poor funding, absence of modern technology, human displacement, loss of jobs and environmental degradation.

Revision Questions

Objectives

1. Land reclamation is a measure aimed at _____ land back to its original state.
A. exchanging
B. limiting
C. restoring
D. lowering
2. Which of the following is not a reason for land reclamation?
A. resettlement
B. restoration
C. recovery
D. reduction
3. All but one of the following are methods of land reclamation.
A. Afforestation
B. New towns
C. Resettlement schemes
D. Land degradation
4. Resettlement scheme is often considered when people are _____ from their original homelands.
A. displaced
B. depopulated
C. exploited

- D. returned back
- 5. Which of the reclamation measures is perhaps the most expensive?
 - A. Slum clearance
 - B. Building of barriers
 - C. Sand filling
 - D. Dredging
- 6. Which is the most appropriate measure for reclamation in wetlands and coastal areas?
 - A. Resettlement
 - B. Sand filling
 - C. Slum clearance
 - D. Shelter belts
- 7. A fundamental problem facing land reclamation in developing countries is
 - A. inadequate skilled manpower
 - B. inadequate fund
 - C. public dislike for land reclamation schemes
 - D. low technology acquisition
- 8. A major problem encountered in slum clearance is
 - A. where to resettle victims
 - B. how to fund it
 - C. how to dispose the rubbles
 - D. payment of compensation
- 9. Afforestation is best suited for restoring_____
 - A. bare lands
 - B. construction sites
 - C. water logged areas
 - D. disused factories
- 10. Erosion control is useful where

- A. there is constant loss of top soil
- B. the land is a former dump site
- C. mining sites are common
- D. there are vast forests

Essay Questions

- 1a. Give three reasons why land reclamation is necessary.
- b. Identify five benefits of land reclamation to man.
- 2a. Briefly describe three methods of land reclamation.
- b. Under what condition is sand filling used?
- 3a. Identify four problems associated with land reclamation?
- b. Suggest three reasons why afforestation is necessary.
- 4a. Why is sand filling considered relevant in the reclamation of water-logged areas?
- b. Describe three ways in which erosion can be controlled in places with bare land surfaces.
- 5a. Suggest three conditions for resettling people to a new area.
- b. Give three reasons why land reclamation is less common in developing countries.