Chapter 3
The Comprehensive Land Use Plan

3.1 Introduction

The Cagayan de Oro City 2013-2022 Comprehensive Land Use Plan was prepared pursuant to the Local Government Code of 1991 (RA 7160), which mandated the Local Government Units, to “prepare their comprehensive land use plans and enact them through zoning ordinances”.

The Plan is meant to guide the city physical development and to steer the city’s growth as the business and trading center of Southern Philippines. It provides a framework of goals, objectives, strategies and actions required for achievement of the city/s future “CdeO 2022”.

3.2 Vision

A city managed through good governance, empowering its citizenry to thrive in a highly competitive economy and a sustainable environment nurturing its diversity and multi-cultural heritage towards a resilient, progressive, and inclusive future.

3.3 Goals, Objectives, Strategies

Goals & Objectives

Upliftment of socio-economic condition by empowering the citizenry for a safe, healthy and secured community integrating the principles of DRR-CCA

- To promote safe, peaceful, orderly, healthy and CCA+DRR resilient community
- To improve the quality of education
- To Implement housing and urban development-related initiatives
- To promote values formation in the community
- To promote skills development and technology transfer
- To provide livelihood opportunities
- Maximize utilization of safe and secure settlement areas to accommodate demand in housing
- To improve water production capacity in order to serve other areas and for future demands
- Improved health services and minimize climate change and disaster related diseases
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- Increased no. of decent and resilient housing for ISFs and formal sector in identified high risk areas in brgy's
- Effective & efficient delivery of social welfare services to affected families in times of calamities

**An efficient and responsive governance**

- To strengthen government-private/NOGs/CSOs collaboration
- To strictly implement environmental and other laws and ordinances
- To improve efficiency in fiscal management
- To formulate and promote policies, laws and ordinances on resiliency to CC/DRR impact with transparency and accountability
- To promote efficiency in fiscal management thru sufficient allocation of funds for the DRR/CCA plans and programs
- To equip city and barangay officials with capacity for effective and responsive urban environmental governance
- Increased resiliency of academic institutions to climate change and disaster related events
- Increase involvement of the private sectors and CSOs in the implementation of projects and programs
- Increase awareness and knowledge on the impacts of CCA/DRR

**A sustainable development for the protection and utilization of natural resources for inclusive growth**

- To preserve natural tourist attractions and cultural heritage sites
- To improve the quality of inland, coastal, surface, and ground waters according to their designated classification
- To protect and conserve the integrity of fresh water resources.
- To ensure effective solid and liquid waste disposal
- To arrest degradation and rehabilitate denuded forest areas
- Provide natural flood abatement facilities
- To promote sustainable use of mineral resources
- To protect wildlife and vegetation and preserve biodiversity
- To minimize occurrence of flooding in the low lying areas and along the riverbanks and its adjoining areas
- To reduce soil erosion and improve soil fertility
- To minimize air pollution in the urban areas
- To protect and conserve ground and surface water
- Maximize use of land in urban areas
- Increase percentage of open spaces
- To improve existing and develop road network to hasten
development in new growth areas in the hinterland barangays

- To formulate a comprehensive transportation masterplan
- To protect and conserve ground and surface water
- To rehabilitate Mangrove and inter-tidal vegetation (coral reef and sea grass areas) in 5 years
- To develop and provide legislated protection to wildlife sanctuary areas
- Establish updated environment planning database
- To optimize agricultural production/productivity and sustain/increase yields by 10%:
  - crops
  - fishery
  - livestock & poultry
  - forestry
- Preserve, protect and enhance natural and heritage tourism sites and indigenous peoples’ way of life

Investment Enabling City

- To maintain good peace and order condition
- To promote green and disaster resilient infrastructure
- To provide infrastructure facilities and utility support
- To organize and develop alternative livelihood system
- To provide adequate supply of potable water
- To strengthen human resources development
- To promote private-public partnership
- To ensure reliability and sustainability of power supply (power generation, power distribution thru N+1 supply mode, renewable energy program)
- To develop and enhance drainage and sewerage system
- To establish efficient and effective information and communication system
- To promote eco-friendly investment opportunities to generate employment
- To ensure unhampered business operations year-round through proper implementation of existing laws and regulations and provision for infra-support facilities.
  - Industry
  - Trade/Commerce
  - Services (e.g. tourism, ICT etc.)
Strategies

Social

Employment & Livelihood
- Livelihood program (home and community-based) to augment income
- Implementation of regular training program for skills development and enhancement (entrepreneurship development program)
- Compliance with standard ration of social services

Housing & Resettlement
- Provision of funds for housing
- Relocation for dwellers within the hazard areas
- Provision of decent, affordable housing on environmentally safe areas
- Adopt community mortgage program for informal settlers
- Application of urban renewal in onsite relocation
- Encourage housing developers to participate/engage in socialized housing

Sports and Recreation
- Establishment of sports complex

Disaster Risk Reduction & Mitigation
- Establishment of evacuation center
- Introduction of alternative livelihood projects
- Conduct IEC/drills of disaster preparedness and implementation of DRRM Plan
- Organization of community disaster response team
- Regular health care and supplemental feeding for malnourished children
- Rescue and emergency drill in community, schools, offices at risk
- Disaster preparedness programs
- Proper utilization of DRRM Fund
- Construction of multi-storey schools and other public buildings in safer areas within the barangay
- Improvement of educational facilities
- Promotion of Technical/Vocational Courses
- Medical Emergency and health services
- Promote the concept of cremation
- Identify possible burial sites
- Promote multi-interment
- Improvement of jail buildings with facilities
• Construction of additional police sub-stations
• Establishment of central fire station and its facilities
• Daycare Centers in all relocation sites
• Landbanking
• Establishment of city social welfare services complex
  o Center for street children
  o Vocational and Development Center for Person/Children with Disabilities
  o Day Center for Senior Citizens
  o Center for Women
  o Center for Mentally Challenged Persons

Economic

• Expand areas for urban greening
• Streamlining business registration process and lowering business transaction costs
• Strengthen investment promotion
• Establishment of high-density commercial district in the new growth areas
• Pedestrianization of commercial districts and in cultural heritage areas
• Promotion of Agricultural Technology in selected rural areas
• Provision of alternative livelihood projects/activities
• Implementation of integrated coastal management plan (11 coastal barangays)
• Development of rural road network linking to primary farming areas
• Establishment of post-harvest facilities
• Enhancement of Agriculture and Fisheries Modernization Plan
• Development of tourism sites
• Development of comprehensive tourism programs
• Encourage farmers/fisherfolks to insure crops, livestock and fishery with PCIC
• Conservation and protection of cultural, natural sites and heritage
• Maintenance of identified natural sites for eco-tourism
• Installation of irrigation facilities (SWIS)

Infrastructure

• Provision, rehabilitation and establishment of quality infra-support (river dikes, protection wall, upgraded drainage canal)
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**Land Use and Environment**

- Promotion of urban gardening
- Passage of ordinance for no build zone areas
- Strict implementation of traffic rules and regulation
- Strict implementation of legal easement as provided by law
- Implementation of project NOAH/warning system in coordination with DOST
- Adoption of River Basin/Watershed Approach in Planning
- Implementation of DRR Management Plan
- Implementation of river basin planning system approach
- Establishment of buffer zones in danger areas

- Formulation of Comprehensive Drainage Master Plan
- Encourage solar energy as alternative source of power
- Improvement of road network
- Establishment of by-passed roads
- Pedestrianization (Divisoria)
- Establishment of bicycle lanes
- Tap alternative sources of potable water
- Establishment of sewerage system
- Promote water conservation practices
- Modify water supply facilities to be hazard resilient
- Dredging of rivers
- Implement/enforce Clean Water Act and other pertinent laws and regulations
- Retrofitting of bridges
- Adoption/integration CCA-DRR plan into urban development.
- Adopt disaster-resilient telecommunication facilities/system.
- Adopt Shift Improve and Avoid policy
- Formulation/development of a Comprehensive Transport Plan
- Promote carpooling and use of public utility vehicles
- Discourage importation of surplus vehicles
- Introduction of rain-harvesting system and other water impounding facilities in big business establishments
- Provision of retaining walls/flood control dikes
- Improvement of river channel
- Shift/influence development from hazard prone to hazard free areas
- Adoption of Geo hazards Consideration in planning and construction.
  - *Encourage structures on stilts*
- Modification of public offices/buildings to be disaster resilient
3.4 The Concept/Structure Plan

The structure plan of the City of Cagayan de Oro focuses on the priority development for the next ten years. This includes the following:

- Conservation and preservation area in Barangays Macahambus, Mambuaya, F.S. Catanico, Malasag, Dansolihon, Bayanga, Cugman, Agusan, Indahag, Balubal
- Heritage Sites in Barangays Poblacion, Divisoria, and Taguanao
- Urban Greening Area in Barangays Poblacion, Isla de Oro and along riverbanks
- Reforestation Area in Barangays Bayanga, Lumbia, Agusan, Baikingon, Besigan, Camaman-an, Canitoan, Carmen, Taglimao, Pigsag-an, Balulang, Tignapolano and Dansolihon
- Light-Medium Industrial Area in Barangays Tablon, Cugman, Agusan, Bugo, Puerto and Lumbia
Mangrove Reforestation in the coastal barangays of Bayabas, Bonbon, Agusan, Tablon, Cugman, Bugo, Puerto, Bulua
- Agricultural and Forest Areas in the southernmost barangays of the city
- Western Urban Development in Barangays Bulua, Patag, Kauswagan, Bonbon and Bayabas
- West Uptown Development in Upper Carmen, Canitoan, Lumbia and Pagatpat
- East Uptown Development in Gusa, Indahag, Macasandig and Camaman-an
- Eastern Urban Development in Upper and Lower Puerto, Bugo, Agusan, Balubal, and Tablon
- Downtown Development in Poblacion (CBD), Carmen, Lapasan, Puntod and Macabalan

### 3.4.1 Preferred Development Thrust

**Commercial and Light-Medium Industrial Development**

The City opted for commercial and light-medium industrial development. The chosen thrust was evaluated through Goal Achievement Matrix (GAM) Analysis. GAM results are presented in Annex A.

### 3.4.2 Major Spatial Development Strategies

1. Entice development in identified growth areas through the provision of basic and excellent facilities (west uptown-Carmen, Canitoan and Lumbia; downtown-Divisoria, Cogon, Carmen, Lapasan, Macabalan, Puntod and Poblacion CBD; western urban-Bulua, Patag, Kauswagan, Bonbon, Bayabas (BULPATKABONBAY); east uptown-Gusa, Indahag, Macasandig and Camaman-an; eastern urban development-Puerto, Bugo, Agusan, Balubal and Tablon)

2. Conservation and protection of natural sites and heritage i.e. gorges landscape, critical habitat, wetlands and river system (Macahambus, Mambuaya, FS Catanico, Malasag, Dansolihon, Bayanga, Cugman, Agusan, Indahag, Balubal)

3. Incorporate provisions of pedestrian (walkways, bicycle lane) on proposed road right-of-way (Divisoria, Poblacion)

4. Identify and legally declare built heritage sites in Divisoria, Taguanao and Poblacion and regulate building heights,
architecture and color for historical-cultural tourism

5. Intensify and sustain urban greening in Poblacion, Isla de Oro and along riverbanks

6. Establish new sanitary landfill in Pagatpat/other suitable alternative site

7. Enforce the setback requirements along public roads for yield points/loading-unloading bay

8. Intensify greening and fruit tree growing in sloping areas of Barangays Bayanga, Lumbia, Agusan, Baikingon, Besigan, Camaman-an, Canitoan, Carmen, Taglimao, Pigsag-an, Balulang, Tignapolohan, and Dansolihan

9. Light-Medium Industrial Areas – Tablon, Cugman, Agusan, Bugo, Puerto, Lumbia

10. Mangrove reforestation - Bayabas, Bonbon, Agusan, Tablon, Cugman, Bugo, Puerto, Bulua

11. Provision of structural mitigation measures (special land use planning) for hazard prone areas

12. Provision of housing for settlers in blighted areas
3.4.3 The Structure Plan
3.5 The Land Use Plan

3.5.1 Urban Land Demand

The projected urban land requirement is based on the current land uses and the population trends. The different sizes of lots used as basis for computation was taken from prevalent size of lot in the city and which are considerably acceptable. For residential projections, a minimum lot size of 80 square meters per housing unit was used for computation.

3.5.2 Land Supply

Identification of land available was taken from the result of thematic mapping. Land available are those potential growth areas which are the remaining areas after deducting all development constraints.

3.5.3 Proposed General Land and Water Uses

3.5.3.1 Agriculture

The Strategic Agriculture and Fishery Development Zone (SAFDZ) and Comprehensive Agrarian Reform (CARP) areas shall serve as the development framework for agriculture. Areas devoted to crops, i.e. corn, bananas, fruits & nuts and vegetables will be retained in the rural barangays while crop production and productivity will be intensified.

For livestock and poultry, backyard production specifically for swine, goats and cattle will be regulated in the hinterland barangays.

Sustenance fishing (inland) shall be developed to augment fishery productivity in potential areas where there are rivers, lakes and fishponds.

Proposed agricultural areas within the planning period summed up to 12,621.32 hectares; roughly 63 percent of which is intended for production, while the remaining 37 percent more or less will be for protection.

3.5.3.2 Forest

The forest areas in the hinterland barangays on the south abutting the provincial boundary of Bukidnon and Lanao del Norte, i.e. Cugman, FS Catanico, Tablon and Balubal will be retained/conserved. Premium and
introduced species will be used in the reforestation of these identified barangays.

To sustain the National Greening Program, tree growing for reforestation at the barangays shall be constantly enforced requiring NSTP to facilitate such activity.

Open grassland will be devoted to fruit trees so as to protect the area from further erosion.

Proposed forest areas within the planning period summed up to 27,906.46 hectares. Around 46 percent of which will be devoted to production, while 54 percent is protection forest.

### 3.5.3.3 Tourism

The current development thrust for the City of Cagayan de Oro identified Eco-tourism as a priority. It has identified the development of Cluster 1 which includes the Calabera Cave located in Indahag and Huluga Cave in Taguanao, this City. It covers approximately 175 hectares comprising the Macahambus Cave and Gorge as well as Historical Heritage sites located in Barangays Lumbia and Bayanga. Total tourism area proposed within the planning period summed up to 1,305.40 hectares.

### 3.5.3.4 Urban Land Use

For the planning period, proposed total urban land use of the city summed up to 13,900.78 hectares.

### 3.5.3.5 Water Use

Appropriate Coastal Use Zone shall be identified and delineated (e.g. recreational areas, mariculture areas, marine protected areas, marine parks, marine reserves, navigational lanes, fishing grounds, eco-tourism destination sites, docking areas).

The following tables show the proposed general land and water use and the comparative general land use of the City within the planning period.
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Cagayan de Oro City Comprehensive Land Use Plan

2019-2027

Table 3.1
Proposed General Land and Water Use
Cagayan de Oro City

<table>
<thead>
<tr>
<th>Land/Water Use Categories</th>
<th>Area (hectares)</th>
<th>% to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural</td>
<td>12,621.32</td>
<td>21.82</td>
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<tr>
<td>Forest</td>
<td>27,906.46</td>
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<tr>
<td>Tourism</td>
<td>1,305.40</td>
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<tr>
<td>Urban Land Use</td>
<td>13,900.78</td>
<td>24.03</td>
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<tr>
<td>Roads, Utilities, etc.</td>
<td>2,117.04</td>
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<td><strong>Total Land Area</strong></td>
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<td>Production Water</td>
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<td>Protection Water</td>
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<tr>
<td><strong>Total Water Area</strong></td>
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Table 3.2
Comparative General Land and Water Use, Existing and Proposed
Cagayan de Oro City

<table>
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<th>Land Use Categories</th>
<th>Area (hectares)</th>
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<th>Existing</th>
<th>Proposed</th>
<th>Existing</th>
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<tr>
<td>Agricultural</td>
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<td>Forest</td>
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<td>Tourism</td>
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<td>0.00</td>
<td>0.00</td>
<td>2.26</td>
<td>2.26</td>
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<td><strong>100.00</strong></td>
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<td><strong>100.00</strong></td>
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</tbody>
</table>
Chapter 3 – The Comprehensive Land Use Plan
3.5.4 Proposed Urban Land and Water Uses

Settlement

The proposed settlement areas are the major and sub-nodes sited along east-west stretch of the city towards the southern escarpment areas. There will be strong linkages of these nodes to the CBD.

Major linkages in the east are the Agusan-Balubal Road and the national highway. The J.R. Borja Road will be extended up to Agusan traversing Cugman and Tablon. The Eastern Coastal Highway shall be completed to decongest traffic along Iligan-Cagayan-Butuan Highway.

For the western nodes, Western Coastal Highway will be fast tracked for completion.

Major linkage in the southern portion is the Iligan-Bukidnon Lateral Highway.

3.5.4.1 Residential Areas

Within the planning period, residential areas remain the highest allocation estimated at 11,177.49 hectares of the total urban land area of Cagayan de Oro. This would dominate the land uses. Significant areas are the relocation sites in Indahag, Calaan, Camaman-an, Canitoan, Balubal and Pagatpat. Medium-rise residential buildings are expected to be adopted for the lack of space vis-à-vis the increase of households. Residential areas are planned to be pedestrian-friendly.

3.5.4.2 Commercial Areas

Mixed uses of commercial areas will be established in Poblacion, Carmen, Lapasan and Gusa that would cater to offices, malls, and shopping/retail/trading services.

New growth/expansion areas will be developed as follows:

- Western Urban Development (covering BULPATKABONBAY)
- West-Uptown Development Area (Barangays Carmen, Canitoan, and Lumbia)
- East-Uptown Development Area (Barangays Gusa, Indahag, Macasandig and Camaman-an)
- Eastern Urban Development Area (Upper Puerto, Lower Puerto and Bugo, Agusan and Balubal, and Tablon)
Downtown Development Area – Poblacion (CBD), Carmen, Lapasan, Puntod and Macabalan

Infrastructure support facilities and amenities such as ample parking areas, upgraded drainage system, developed sewerage system, and improved telecommunication network facilities will be provided in these growth areas.

Commercial area within the planning period is estimated at 792.03 hectares.

3.5.4.3. Industrial

Areas along Tablon would be processing of agricultural products while this would be mixed to wood-based industries.

Lumbia Airport will be converted into Industrial Economic Zone.

Agro-industrial development will take place at Upper Puerto.

Light-medium industries will be developed at Lower Puerto, Bugo and Tablon.

Tourism Infrastructure and Economic Zone will be established at Cugman, along with development/expansion of industrial warehousing facilities.

Cashew and Cashew Nuts Production at Lumbia will be intensified for cashew industry development, as well as product Innovation and promotion.

Proposed industrial areas within the planning period summed up to 290.34 hectares.

3.5.4.4 Institutional

Barangay centers, schools, churches and government centers are the institutional uses with location dispersed throughout the locality.

Youth centers will be constructed in four strategic areas, namely: Lumbia, Carmen, Nazareth and Lapasan.

A sports complex equipped with world-class facilities will be constructed at Barangay Lumbia.

Within the planning period, proposed institutional areas summed up to 405.93 hectares.
3.5.4.5. Agro/Eco-Tourism/Heritage Area

Natural/heritage sites such as gorges, caves, wetlands as well as the river systems shall be rehabilitated, conserved and protected. These are located in Barangays Lumbia, FS Catanico, Cugman, Agusan, Bayanga, Mambuaya, Dansolihan, Macasandig, Agusan and Bonbon.

Built heritage sites are located in Divisoria and the area stretching to St. Augustine Cathedral. Building heights, architecture and color shall be regulated for historical/cultural tourism. Approved cultural heritage sites shall be preserved and enhanced.

Agro-Tourism will be developed at Palalan, Tablon with piped irrigation system for farm lots watering. Other Barangays identified are Lumbia, Pagalungan, Bayanga, Mambuaya, Dansolihan, Taglimao, Tagpangi, Tignapoloan, Tuburan, Tumpagon, Pigsag-an, Besigan.

Downtown check-in lounge and shuttle shall be established to ferry airport passengers from Cagayan de Oro to Laguindingan Airport and vice versa. An alternative fast craft ferry system to Laguindingan Airport will be established.

Regular Maintenance and Enhancement of existing historical landmarks in the city will be done.

3.5.4.6 Parks and Open Space

Salient feature is the proposed Isla de Oro River Walk with the urban renewal activity in Burgos Area. It features low-impact development and landscaping. Beautification and urban greening in major thoroughfares will be implemented and maintained.

Escarpmment areas are for tree planting/growing and greening Cagayan de Oro River.

Green-belt areas and forest parks in various islets in Cagayan de Oro River will be identified and established.

Additional parks and playgrounds shall be developed while the existing shall be improved.

The City Amphitheater will be re-developed as modern public amusement and recreational center with basement parking area.

Areas for parks and open spaces summed up to 332.57 hectares within the planning period.
3.5.4.7 Mangroves

Mangroves in the city are located in the coastal floodplains of Bulua, Bayabas, Bonbon, Lapasan, Agusan, Bugo, Puerto, Tablon and along the riverbank of Kauswagan. These are the same areas currently subjected to mangrove reforestation activities of the city government in partnership with the fisherfolk associations of respective barangays.

Table 3.3 shows the proposed urban land and water use of the City within the planning period, while the comparative urban land and water use is shown in Table 3.4.

### Table 3.3
Proposed Urban Land and Water Use
Cagayan de Oro City

<table>
<thead>
<tr>
<th>Land Use Categories</th>
<th>Area (hectares)</th>
<th>% to total</th>
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<tbody>
<tr>
<td>Agro-Industrial</td>
<td>822.55</td>
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<tr>
<td>Commercial</td>
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<td>Industrial</td>
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<td>Institutional</td>
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<td>Open Space/Vacant Land</td>
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<tr>
<td>Residential</td>
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<tr>
<td>Swamp/Marshland</td>
<td>79.87</td>
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<td><strong>Total</strong></td>
<td><strong>13,900.78</strong></td>
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### Table 3.4
Comparative Urban Land and Water Use, Existing and Proposed
Cagayan de Oro City

<table>
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<th>Land Use Categories</th>
<th>Area (hectares)</th>
<th>% to total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Proposed</td>
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<tr>
<td>Agricultural</td>
<td>8,065.10</td>
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<tr>
<td>Agro-industrial</td>
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<td>822.55</td>
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<tr>
<td>Commercial</td>
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<td>Forest</td>
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<td>Industrial</td>
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<td>Institutional</td>
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<td>Mining and Quarrying</td>
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<td>Residential</td>
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<td>Swamp/Marshland</td>
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<td>Utilities</td>
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<td><strong>Total</strong></td>
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<td><strong>13,900.78</strong></td>
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Chapter 3 – The Comprehensive Land Use Plan
3.5.5 Development Directions/Guidelines/Policies

3.5.5.1 Urban Development-Growth Areas

3.5.5.1.1 Urban Expansion Area #1

(Western Urban Development Area)

Western Urban Development covers Barangay Bulua, Patag, Kauswagan, Bonbon and Bayabas.

This growth node serves as the entry and exit points from and to Laguindingan Airport and other parts of the country. This also serves as the major convergence point for people, goods and products, as well as transport service to and from other parts of the region.

- Existing Facilities
  1. Integrated Bus and Jeepney Terminal
  2. Fish and vegetable landing
  3. Coastal road passing through barangays Gusa, Lapasan, Kauswagan, Bayabas, Bulua and Iponan

- Proposed Development
  1. Commercial mixed use medium to high density pedestrian friendly center for Cagayan de Oro City.
  2. Commercial areas along Western Coastal Highway-Kauswagan, Bayabas, Bulua
  3. Completion and widening of western coastal highway
  4. Establish/construct main drain (canal)
  5. Waste water treatment for subdivisions
  6. Preservation and expansion of wetlands in Bulua, Bonbon and Bayabas
  7. Provision of multi-purpose and socio-economic centers (reading centers, parks, and the like)

3.5.5.1.2 Urban Expansion Area #2

(West-Uptown Development Area)

Covering Barangays Carmen, Canitoan, Lumbia and Pagatpat. This will be a medium to high-density, mixed-use pedestrian friendly center with high end, low-density type of development for residential and commercial uses. This area
will decongest the present major urban center/city core and shall provide more opportunities for socio-economic activities.

The Lumbia Airport shall be converted into an industrial area/economic zone which shall then become a major provider of employment for the people in the city.

➢ Existing Facilities

1. Macapagal Highway Extension connecting to the western coastal highway.
2. An established residential and commercial areas and neighborhood centers such as; Pueblo de Oro Township, Camella and Xavier Estate.
3. SM Shopping Mall
4. Xavier University IT Park

➢ Proposed Development

1. Development Master and Urban Design Plan
2. Road Network Development
3. Establishment of green belt areas
4. Establishment of parks and open spaces
5. Establishment of tree parks in subdivisions
6. Strict implementation of tree planting strips in major thoroughfare including subdivision major roads
7. Establish main drain from airport going to Calaanan Creek (canal)
8. Waste water treatment for subdivisions
9. Establishment of retention basins
10. Rain harvesting for commercial establishments and residential buildings
11. Establishment of retirement community
12. Provision of multi-purpose and socio-economic centers (reading centers, parks, and the like)

3.5.5.1.3 Urban Expansion #3

(East-Uptown Development Area)

Located in Barangays Gusa, Indahag, Macasandig and Camaman-an. This area will have the same function as that of the West-Uptown Development Area with the presence of high-end subdivisions like the Fil-Estate Subdivision and Alegria Hills.
This area is linked to the other major urban centers through the Pelaez Highway that also connects to the West-Uptown Development Area.

- **Existing Facilities:**
  1. Convention Center (on-going construction)
  2. Camp site for Boys Scouts of the Philippines
  3. High end residential subdivisions
  4. Heritage area (Huluga Cave in Indahag)
  5. City relocation site (Indahag)
  6. Private Schools

- **Proposed Development**
  1. Slope protection/regulated development
  2. Establishment of green belt areas
  3. Establishment of tree parks in subdivisions
  4. Strict implementation of tree planting strips in subdivisions
  5. Establishment of retention facilities
  6. Waste water treatment for subdivisions
  7. Rain harvesting for commercial establishments and residential buildings
  8. Provision of multi-purpose and socio-economic centers (reading centers, parks, and the like)

### 3.5.5.1.4 Urban Expansion #4
**(Eastern Urban Development Area)**

This area is composed of the following sub-nodes, namely: Upper Puerto, which is identified as an Agro-Industrial Area; Lower Puerto and Bugo which are existing industrial and residential areas; Agusan and Balubal, which are hosts to high-end subdivisions; Tablon, which is an existing industrial area; and, Palalan, Tablon, which is identified for Agro-Tourism.

- **Existing Facilities:**
  1. Sayre Highway which has recently been upgraded with a fly-over to ease traffic congestion at the intersection provides linkage to the Provinces of Bukidnon and Cotabato
  2. Iligan-Cagayan-Butuan Super Highway links the area to the Provinces of Davao, Agusan, Surigao and Sarangani
  3. Puerto Public Market serves as trading center for goods and other products from adjoining areas.
Proposed Development

1. JR Borja Extension shall be connected to Agusan, Balubal and Puerto
2. Concreting from Agusan to Manolo Fortich Highway
3. Waste water treatment for subdivisions
4. Establishment of green belt areas for subdivisions with slope 18deg and up
5. Establishment of tree parks in subdivisions
6. Strict implementation of tree planting strips in subdivisions
7. Rain harvesting for commercial establishments and residential buildings
8. Slope protection/regulated development
9. Regulate/Limit industrial land use along coastal area at Tablon
10. Harmonize the various land uses in Tablon and enhance the ecology (mangrove reforestation)
11. Livelihood improvement for the marginal fisherfolks affected at the same time retain the industrial base
12. Provision of multi-purpose and socio-economic centers (reading centers, parks, and the like)
13. Agro-Tourism development at Sitio Palalan in Tablon (piped irrigation system for farm lots watering)
14. Secondary Road (20m) Network for Sitio Palalan in Tablon

3.5.5.1.5 Urban Expansion Area #5

Downtown Development Area – Poblacion (CBD), Carmen, Lapasan, Puntod and Macabalan

This Downtown Development Area is going to be a high density commercial district comprised of the Poblacion or CBD and Barangays Carmen, Lapasan, Puntod and Macabalan.

Existing Commercial and Residential Areas

1. Presence of big business establishments like Limketkai Mall, Gaisano City Mall, Pure Gold and Centrio Mall and Tower
2. Macabalan Port
3. Integrated Bus and Jeepney Terminal (Agora, Lapasan)
4. Public Markets (Cogon, Carmen and Agora)
5. Recreational Sports Facilities (Sports Center)
6. Institutional Facilities (Academic and Government)
Proposed Development

1. Develop an expanded downtown master plan
2. Provision of new Transportation Master Plan with the introduction of new traffic scheme
3. Downtown check-in and shuttle for airport passengers from Cagayan de Oro to Laguindingan Airport (Fast craft or utility vehicles)
4. Provision of sidewalks and pedestrian lanes
5. Establishment of interceptors from city hall to Isla Bugnaw
6. Establishment of green belt areas at Islas de Oro, Bugnaw, Baksan
7. Installation of rain harvesting facility for commercial establishments and residential buildings
8. Establishment of tree parks in subdivisions
9. Strict implementation of tree planting strips in subdivisions
10. DEWATS (Waste water treatment facility) baffled with planted gravel filter.
11. Waste water treatment for subdivisions
12. Urban renewal for blighted areas
13. River front development project
14. Urban greening of Divisoria
15. Provision of vertical parking space
16. Provision of multi-purpose and socio-economic centers (reading centers, parks, and the like)

3.5.5.2 Conservation and protection of natural sites and heritage i.e. gorges, caves, wetlands and river systems. (Barangays Lumbia, FS Catanico, Cugman, Agusan, Bayanga, Mambuaya, Dansolihon, Macasandig, Agusan and Bonbon.)

3.5.5.2.1 Dansolihon/Bayanga/Mambuaya–Cave System
Bayanga/Lumbia - Macahambus Cave & Gorge (Natural sites and heritage)
Malasag, Cugman - Protection of natural sites for forest reserves;
Taguanao, Indahag - Natural sites and heritage

- Clarification of the status of land ownership (DENR declaration as Forestal Area)
- Regulate/ limit settlement in the area to preserve its natural site
- Non issuance of land title/tax declaration

3.5.5.2.2 Mambuaya-River system for tourism particularly river
rafting; Cugman-River system; Agusan- River system; Cagayan de Oro River – protected area

- Prohibit settlements within the legal easement along the riverbanks by strict implementation of existing national & local laws.
- No build zone and restriction of development along the area

3.5.5.2.3 FS Catanico- Natural sites for tourism;

- Development and improvement of the identified natural sites for tourism

3.5.5.3 Incorporate provisions of pedestrian network (walkways, bicycle lane) on proposed road right-of-way (Divisoria, Poblacion)

3.5.5.3.1 Divisoria

- Provide 1.20 m. width both sides for bicycle parking
- Amendment of existing City Ordinance pertaining parking areas at Divisoria

3.5.5.3.2 Poblacion

- Propose bicycle lane of 1.20m width at the left side of the road
- Identify specific locations of ramp for compliance of BP 344
- Sidewalks alignment for safety

3.5.5.4 Identify and legally declare built heritage sites in Divisoria, Taguanao and Poblacion and regulate building heights, architecture and color for historical-cultural tourism

3.5.5.4.1 For 16m wide road allow construction of 4 storey building. For 32m wide road allow construction of 8storey building.

- Strict implementation on the provisions of the NBC and Zoning Ordinance of the city
- Adaptation of the framework plan
Chapter 3 – The Comprehensive Land Use Plan

3.5.5.5 Intensify and sustain urban greening in Poblacion, Isla de Oro and along riverbanks

3.5.5.5.1 Poblacion

Identified greenbelt area/urban greening at Poblacion: Capistrano St., Velez St., Corrales Ave., JR Borja St., Osmeña St., Gaabucayan St. with total area of 13.5 hectares

- Establishment of greenbelt areas/urban greening
- Maintenance of existing planted trees
- Additional areas to be planted with ornamental plants in planter boxes

3.5.5.5.2 Isla de Oro (8.85 has.), Isla Bugnaw (4.1 has.), Isla Baksan (2.3 has.) with total area of 15.25 has.

- Develop forest park specially in no build zone identified areas
- Establish river protection dikes and planting of bamboo trees, talisay trees, lambago trees and pagatpat trees along the riverbanks
- Planting of endemic/hardwood trees for future seedbank and tree repository

3.5.5.5.3 Riverbanks- Cagayan de Oro River, Iponan River, Umalag River, Bigaan River, Tablon River, Agusan River, Puerto River, Besigan River, Tignapoloan River, and Cugman River with a total area of 225 linear kilometers

- Strict implementation of the National Greening Program
- Adoption of watershed characterization and management plan
- Require NSTP to facilitate tree growing for all freshmen students
- Intensify rehabilitation and establishment of riverbank vegetative measure

3.5.5.6 Development of Pagatpat Sanitary Landfill (area: 41 has.)

1. Land use conversion from CBFM to Sanitary Landfill (for conversion to special land use)
• Continue the re-compensation of the improvements of the surface claimant/affected areas (City Ordinance)
2. Conduct Hydro Geologic and Geotechnical studies of the area to determine its feasibility
3. Preparation of site development plan
   • Actual zoning/allocation of area as to waste segregation, waste special waste, reuse, recycle and research
4. Contain tributaries creeks within the subject area and provide peripheral canal/drainage
5. Provide monitoring wells in strategic location to monitor the possible leachate seepage and percolation

3.5.5.7 Enforce the setback requirements along public roads for yield points/loading-unloading bay-nodal growth areas
   • Enforcement of the NBC and the RTA regulation
   • Define road width, type of occupancy, historical sites
   • Assign overseer on the growth areas depending on the development concern of each growth center
     o West Urban Center - 30 m. RROW
     o West Uptown Urban - 30m. RROW
     o East Uptown Urban Center -15m. RROW
     o Urban Center J.R Borja - 12m. RROW
     o East Urban Center - 12m. RROW

3.5.5.8 Intensify greening and tree growing in sloping areas of Barangays Bayanga, Lumbia, Agusan, Baikingon, Besigan, Camaman-an, Canitoan, Carmen, Taglimao, Pigsag-an, Balulang, Tignapolohan, Dansoloohan
   • Implement reforestation (premium and introduced species) for domestic use in the identified areas
   • Require NSTP to facilitate tree growing for all freshmen students

3.5.5.9 Light-Medium Industrial Areas – Tablon, Cugman, Agusan, Bugo, Puerto, Lumbia

3.5.5.9.1 Allocate industrial zone area for future expansion, new plants and possible relocation of industries inappropriate to their existing location (within residential areas) area: 100 hectares within Tablon to Palalan
• Relocation on light-medium industries within the residential area (e.g. Barangay Cugman)
• Strict monitoring of industrial plants in compliance to environmental requirement (e.g. ECC)
• Industrial Zone area for relocation/transfer
• Improvement of private ports and open the facilities for other industries to cater shipments of products and raw materials
• Existing light to medium industries along the coastal areas will be required to plant mangroves

3.5.5.9.2 Light-Medium industrial area at Lumbia

• Enhance/improve cashew nuts production.
• Establish backyard-type cashew plantation.
• Conduct capability enhancement program related to cashew production.

3.5.5.10 Mangrove reforestation - Bayabas, Bonbon, Agusan, Tablon, Cugman, Bugo, Puerto, Bulua

• Inventory/Assessment and reversion of abandoned fishpond areas to mangrove (RA 8550)
• Rehabilitation of mangrove areas
• Preservation of wetland areas
• Strict implementation of the Wild Life Conservation Program pursuant to RA 9147 (Wild Life Act)
• Inventory and enhancement of flora and fauna
• Identification, protection and conservation of critical habitats (caves, wetlands, river systems, natural and built heritage areas)
• Enforcement of beach rehabilitation program pursuant to EO 533
• Adaptation and implementation of the City Integrated Coastal Management (ICM) Plan pursuant to EO 533
• Implementation of water easements (3m in urban, 20m agro areas as per Water Code 1067
• Declaration and management of marine protected areas
• Enactment of Local Fishery Code in conformity with RA 8550
• Enactment of Coastal Zoning Ordinance and integration to CLUP

3.5.5.11 Provision of structural mitigation measures (special land use
planning) for hazard prone areas

3.5.5.11.1 Establishment of Retention Basins at (strategic areas similar to MMDA)

- Conduct study to determine appropriate area for retention basin. (Gaisano Mall, KetKai, and MUST)
- Require the industries /establishments to maintain retention basins

3.5.5.11.2 Dredging of rivers, creeks waterways

3.5.5.11.3 Adopt the 20m easement of no build-zone and utilize it for research and forestry development, agriculture, fishery, plantation, and sanctuaries

- Strict implementation of guidelines for sand and gravel extraction and provide protection measures along the banks of the area applied
- Contribute to the long term plan in establishing dikes for systematic quarry operations
- Formulate guidelines/with penalties for strict implementation on the maximum depth/allowable for sand and gravel extraction which is more or less 2.00 meters and succeeding extraction will be based on replenishment capacity of the river.
- Quarry permits/operators that fall at meandered sections of the river shall be directed to include straightening of the river and shall form part of their development plan.

3.5.5.11.4 Straightening/Rechanneling of severely meandered sections of Iponan River and other areas to increase the discharge capacity since obstruction are already minimal

- Coordination of the government agency as to the private lots that maybe affected by said rechanneling/straightening

3.5.5.11.5 Formulation of drainage master plan

3.5.5.11.6 Enact an ordinance requiring land developments to provide retention basins to delay discharge of surface run off to
existing waterways.

- Strict implementation of guidelines for drainage system of land developments/subdivisions.

3.5.5.11.7 Area declared as no build zone (from shoreline to Pagatpat more or less 90 has., from shoreline to Balulang more or less 50 has., more or less 15.25 hectares comprising Isla de Oro, Bugnaw, Baksan) shall be utilized for plantation, propagation of premium trees, research for forestry, agriculture, fisheries and wild life and recreation.

- Establish the perimeters and boundaries of the No Build Zone area in accordance with the existing city ordinance.
### 3.6 Land Use Sector Policy Options

<table>
<thead>
<tr>
<th>Issues/Concerns</th>
<th>Implications</th>
<th>Policy Options/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty in implementing the no build zone policy due to lack of implementing guidelines</td>
<td>Residents returning to their former residences identified as hazard areas</td>
<td>Enactment of city ordinance to implement the no build zone policy in geohazard areas and heritage areas</td>
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<td>New occupants/informal settlers on hazard areas</td>
<td>Implementation of Early Warning system at the Barangay level</td>
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<td>Delineate no build zones</td>
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<td></td>
<td>Development of forest park particularly in no build zone identified areas</td>
</tr>
<tr>
<td>Encroachment of private claims in Legal Easements along coastal, deltas and riverbanks</td>
<td>Increase frequency Flooding/Obstruction of waterways and reduction of absorption capacity of beaches and shores</td>
<td>Enactment of city ordinance to implement legal easement</td>
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<tr>
<td></td>
<td>Potential risk to lives and properties in case of flooding,</td>
<td>Removal/relocation of informal settlers.</td>
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<td>Demolition of illegal structure after due process</td>
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<td></td>
<td>Enforcement of pertinent local and national laws on illegal structures</td>
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<td>Strict monitoring and coordination among RLAs and</td>
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<tr>
<td>Storm Surge and Fire</td>
<td>Non Preservation of Old Identity/Structure of the City's Cultural/Heritage Structure</td>
<td>Lack of Consistencies in the Implementation of IPRA Law and Existing Policy on Tenured Timberland Areas</td>
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<tr>
<td>Prevent Public Access</td>
<td>Lose Identity of the City</td>
<td>Non Compliance of Requirements</td>
</tr>
<tr>
<td></td>
<td>Identification, Survey and Evaluation of Existing Old Structure and Heritage Site Both Natural and Built with Historical Accounts</td>
<td>Review of Existing Policies/Guidelines on Issuance of Tenurial Instruments to Timberland Areas and Submit Findings and Recommendation to Harmonize the Implementation of the IPRA Law. (Adaptation-Non Structural)</td>
</tr>
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<td></td>
<td>Implementation of Heritage Act Pursuant to RA 1601</td>
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<td>Integration to the Strategy of the Tourism Program of the City</td>
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<tr>
<td></td>
<td>Preservation and Enhancement of Approved Cultural Heritage Sites and Structures</td>
<td></td>
</tr>
</tbody>
</table>

Chapter 3 – The Comprehensive Land Use Plan
| Conflicting uses of coastal use zone | Low productivity of coastal/marine resources  
Reduction of income of fisher folks and business people  
Loss of natural protective covers of shoreline areas and loss biodiversity | Enactment of local fishery code in conformity with ra8550  
Implementation of legal easement on coastal areas  
Identification and designation of appropriate Use Zone (ex. Recreational, mariculture areas, marine protected areas, marine parks, marine reserves, navigational lanes, fishing grounds, eco-tourism destination sites, docking areas) and formulate coastal use management plan to be integrated in the CLUP  
Implementation of coastal use management plan integrated in the CLUP  
Reversion of abandoned fishpond areas to mangrove rehabilitation areas |
### Chapter 3 – The Comprehensive Land Use Plan

**Degradation of watershed areas**
- Flooding downstream
- Siltation of rivers due to agriculture and mining activities

**Preparation and adoption of Watershed Management Plan**
- Adoption of NIPAS law in critical watershed areas
- Restore water quality based on its most beneficial use/designated classification
- Formulation of CdeO and Iponan River Rehabilitation Plan

**Reforestation/Protection in watershed areas to improve vegetative cover**
- Establishment of protected areas

**Coordination with LGUs within the watershed areas**

**Loss of wetland areas due to continued urban development**
- Reduced fish catch
- Loss of bio diversity
- Loss of grain production areas (rice fields)

**Conduct massive assessment and inventory of abandoned fishpond and enact ordinance on conversion of the same to mangrove area**

**Mangrove reforestation**

**Presence of illegal mining operations**
- Siltation due to illegal mining activity

**Strict Implementation of mining laws**
- Creation of Bantay Kalikasan task force at

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*Note: The table above outlines the challenges and solutions related to the Comprehensive Land Use Plan for Cagayan de Oro City from 2019 to 2027.*
### Chapter 3 – The Comprehensive Land Use Plan

#### Denuded forest due to illegal mining activity
- Extreme flooding in urban and rural areas
- Reforestation and rehabilitation of denuded forest areas
- Establishment of greenbelt areas
- Enforcement of mining laws

#### Timber poaching in the hinterland barangays
- Denuded forest
- Provisions of livelihood project in the upland barangays
- Tree planting and growing

#### Conversion of prime agri-lands to residential purpose
- Reduced agricultural production and productivity
- Strict implementation of RA 8435

#### Pollutive discharges from agricultural, residential, commercial and industrial establishments.
- Contamination of water bodies
- Decrease productivity of marine and aquatic resources
- Potential risk to health
- Enactment of septage management ordinance.
- Require all hotels, malls, hospitals, and similar commercial establishments to put up their own sewerage treatment (as a requirement in building permit issuance).
- Provision of septage management facility (interim) to cater individual residential houses and commercial
<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of sanitary facilities (open defecation)</td>
<td>Permit issuance. Require plantations and individual farms to implement best management practices.</td>
</tr>
<tr>
<td>Unregulated extraction of ground water</td>
<td>Relocation of informal settlers. Strict enforcement of sanitation code (thru barangay enforcement). Owners to provide septic tanks for animal wastes.</td>
</tr>
<tr>
<td>Depletion of ground water, salt water contamination (salinity intrusion), and ground subsidence</td>
<td>Creation of city water resources board to look into deep wells. Strict regulation in putting up of deep wells (NWRB permit). Require owners of deep wells to plug abandoned wells in order to prevent further contamination of neighboring deep wells. Monitoring of deep wells.</td>
</tr>
</tbody>
</table>
### Chapter 3 – The Comprehensive Land Use Plan

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impact</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unregulated mining and quarrying activities in rivers of Cagayan de Oro</td>
<td>Siltation and contamination of rivers</td>
<td>Strict enforcement of mining laws by LGU and MGB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deputize barangay officials to enforce mining laws.</td>
</tr>
<tr>
<td><em>Indiscriminate disposal of solid waste and hazardous waste</em></td>
<td>Contamination of groundwater and health risk</td>
<td>Establishment of MRF for every barangay or cluster of barangays to include hazardous wastes (busted lamps, used cellphone batteries, etc).</td>
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<tr>
<td></td>
<td></td>
<td>Strict enforcement of Ecological Solid Waste Management Ordinance</td>
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<tr>
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<td></td>
<td>IEC on SWM</td>
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<tr>
<td></td>
<td></td>
<td>Create Solid-Waste Management Board</td>
</tr>
<tr>
<td><em>Open burning of garbage</em></td>
<td>Increased carbon emission</td>
<td>Passage of an ordinance in accordance with RA 9003 and enforcement of ordinance at the barangay level.</td>
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<tr>
<td></td>
<td>Increased potential risk to health</td>
<td>Enforce open burning</td>
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<tr>
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<td>Intensify the conduct of IEC on effects of open burning</td>
</tr>
</tbody>
</table>
### Chapter 3 – The Comprehensive Land Use Plan

<table>
<thead>
<tr>
<th>Proliferation of smoke belching vehicles</th>
<th>Increased carbon emission</th>
<th>Intensify anti smoke belching drive to be undertaken by LGU (by entering into a MOA with LTO). Operationalize multi-sectoral CdeO Airshed Management (RA 8749-Clean Air Act) Conduct Carbon Reduction Initiative</th>
<th>Strengthen motor vehicle inspection system (MVIS) thru LTO to check vehicle condition prior to registration. Collaboration of LTO and LGU in monitoring smoke belchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of area for public burial sites</td>
<td>Congested and flood prone burial site High cost of private burial sites Poor sanitation</td>
<td>Multi-storey or multi-level entombment</td>
<td>Establish public crematorium and columbarium Identify additional burial sites not prone to flooding</td>
</tr>
<tr>
<td>Lack of parks and playgrounds, sports, camping grounds and other recreational facilities</td>
<td>Low performance on basic education indicators High incidence of life-style diseases</td>
<td>Improvement of existing facilities</td>
<td>Development of additional facilities Identify area for the construction of sports dome and its facilities</td>
</tr>
</tbody>
</table>
### Cagayan de Oro City Comprehensive Land Use Plan

#### 2019-2027

| Inadequate area for the construction of protective and social welfare services buildings and facilities | Congestion results to sickness/illness of inmates
| Low efficiency rate in providing police services
| Delayed response to emergency call
| Deprivation of senior citizen’s need for socialization and active community involvement
| Lack of technical skills
| Identify appropriate areas for protective and social welfare services

| Absence of Health Center in some poblacion barangays and relocation area | Inadequate/poor health services rendered
| Poor health ambitions and vulnerability to diseases
| Inaccessible health services
| Establish health center within the area of city health office
| Establish health center in all relocation sites

| Absence of Youth Center | Deprivation of out of school youth to acquire knowledge and opportunities for self advancement
| Identify areas for youth centers in four (4) strategic areas; Lumbia, Carmen, Nazareth, Lapasan.
3.6 Integrated Land Use and Environment Priority Programs and Projects

3.6.1 Land Use Sector

- Delineation of 20-m legal easement along riverbanks
- Increase bulk density regulation
- Increase open space requirements in complex subdivisions
- Establishment of green belt areas
- Delineation of "No Build Zone" areas
- Intensification of the city's land banking program
- Initiate updating of the Land Classification Map of the city

3.6.2 Environment Sector

City Forest Resources and Flood Control Facilities Development Program

- Hinterland Barangays Reforestation Project (including the implementation of the Forest Land Use Plan)
- Industrial Tree Plantation Project
- Forest Communities Livelihood Support Project (livestock production, handicrafts, gardening, seedling, and indigenous industries development)
- Agro-Forestry Development Projects (nursery establishment, rattan and bamboo plantation, tree orchards, and botanical park development)
- Implementation / Integration of CDORBMC Programs and Projects into the city CLUP PPAs
- City Flood Dissipators / retention/ abatement Projects

City Coastal and Marine Resources Development Program

- CDO Riverine Barangays Wildlife Sanctuary and Mangrove Reforestation Project (including all no-build-zones within JICA/WB /CDO Project delineation)
- Coastal Mangrove Reforestation Project
- Establishment of Aquatic Conservation Nursery Centers
- Enactment of City Ordinance converting all no-build zone areas along rivers, and creeks into Barangay Ecotourism and Protected Wildlife Sanctuary Areas
- Enactment of Ordinance addressing conversion of abandoned fishpond areas to mangrove areas
Chapter 3 – The Comprehensive Land Use Plan

**Environmental Governance Capability Building Program**

- Enactment of ordinance providing Off-campus Environmental Management Training Courses for all City and Barangay Officials¹
- Formal off-campus Capability-Building for all City, and Barangay Officials for Environmental Management Courses (Voluntary Basis)
- IEC on urban greening along the riverbanks and coastline areas, green belt areas, tree parks and green strip in subdivisions and all open public places.

**Planning Research and Development Program**

- Establish Database for Shoreline Tracing / Coastal trending
- Establish Ecological Baseline Data, and conduct river assessment particularly on water quality, volume of river discharges, tidal variation data, and extent of water pollution after flooding.

**Urban Fresh Water Resources Management Program**

- Installation of rainwater harvesting facility and water impounding system
- Metering of Ground Water Project

**City Liquid Waste Management Program**

- Enactment of Septage Management Ordinance (for both urban and rural barangays)
- Establishment of Septage Treatment and Disposal Facility for city barangays
- Enactment of Integrated Urban Drainage and Combined Septage-Sewerage Master Plan
- Enactment of Ordinance for Waste Water/Septage Treatment and Disposal facilities among subdivisions (1% of project area taken from the 5% of the open space)
- Enactment of City Ordinance establishing the City Sewerage System
- Sewerage Treatment and Disposal System Project
- Liquid Waste Monitoring and Disposal Capability-Building / Training Project
City Solid Waste Management Program

- IEC on Solid Waste Management (SWM)
- Strengthening of City Solid Waste Management Board
- Establishment of Sanitary Landfill
- Transfer Station /MRF Project

City Air Quality Management Program

- Enactment of local ordinances implementing Clean Air Act in the city
- Air Quality Monitoring Capability - Building /Training Project
- Air Quality Monitoring and Testing Facility Project