

Chapter 5: Issues, Goals, Objective/Targets (Sectoral + DRR/CCA concerns)

1. Development Issues and Problems

The increasing trend in population in the province would require an increase in settlement areas. This may pose potential encroachments to the critical production and protection lands. At present, however, the increase in settlements can still be accommodated by the existing settlement area. The underlying concern in this situation is the present location of the built-up areas in the province. There are major built-up areas that are located near the critical production lands and have the potential to expand its areas towards production lands. There are also settlements in the rural areas that are situated near or at production and protection lands.

Based on the assessment of the existing situation, the major development issues and problems are summed up as follows:

- a. The increase in population has corresponding encroachment of settlements/built-up areas to protection lands and critical production lands
- b. Resource depletion and environmental degradation
- c. Increasing demand for social infrastructure and services due to increasing population
- d. Inadequate infrastructure support facilities
- e. Unstable peace and order
- f. Low economic productivity due to lack of initial capital, lack of managerial and entrepreneurial capability and fluctuating market prices.

Development Goals:

- Provide life preservation and meet the basic subsistence needs of affected population during or immediately after a disaster;
- To reduce human suffering and economic loss caused by natural disasters;
- To raise awareness of the communities on the cause and effect of CCA and develop adaptive capacities;

2. Development Goals, Objectives and Targets

Cotabato Province adopts the following general goals, objectives, strategies and PPAs for the appropriate delineation of settlements, protection lands, production lands and infrastructure as shown in the following tables.

Table 143. Issues/Problems, Goals, and Objectives/Targets

Issues/Problems	GOALS	OBJECTIVES/TARGETS
DRIVERS		
Population		
<ul style="list-style-type: none"> • Projected encroachment of urban settlements in critical production areas • Existence of settlements in protection lands • Concentration of population along main transport axis 		
Economy		
<ul style="list-style-type: none"> • Lack of sustainable employment opportunities in the countryside • Inadequate agricultural support services in terms of credits and other facilities • Low farm income due to non-use of appropriate technology including organic farming • Deteriorated irrigation facilities • Lack of irrigation facilities appropriate for highland areas • Unstable international/local markets for commercial crops such as oil palm, coconut and rubber • Absence or lack of access to market related database • Inadequate impetus for harnessing tourism and investment potentials • Inadequate tourism facilities • Lacking investments to key potential tourism sites • Potential ARBs are underserved 		

Physical Resources		
<ul style="list-style-type: none"> • Depletion and denudation of forest cover resulting to soil erosion/ landslide and siltation of river basins • Environmental degradation especially the watershed • Non-compliance to Land Use and Zonification Plans • Growing settlements in environmentally-critical areas 		
Transport/Access		
<ul style="list-style-type: none"> • Inadequate and poor condition of road networks and bridges • Absence of local air transport facilities • Undeveloped potential water transport via Ligawasan marsh 		
Income/Access to Services		
<ul style="list-style-type: none"> • Inadequate health services and facilities • Failure of RHUs to comply with requirements for Sentrong Sigla P2 L1 certification and PHIC accreditation; • Lack of health personnel and training of the available human resource complement to carry out the priority health programs; • Insufficient budget for logistics and medicines • No Upgrading of staff capacity in terms of hospital and financial management (for deletion) • Improper drug management • Untrained personnel dispensing drugs at the Botika ng Barangay (BnB) • No strict implementation of national health-related policies, e.g Milk Code, Sanitation Code, Anti-smoking, etc) 	<ul style="list-style-type: none"> • Integrated and comprehensive approach to public health development in order to effectively deliver quality complementary, preventive, curative and rehabilitative health services and improved hospital service capability 	<ul style="list-style-type: none"> • To improve access to and delivery of quality health care services among populations within the four ILHZs in Cotabato Province • Upgrading of hospitals and services • To ensure that health services and goods provided in the health facilities meet the standards for quality seal •
<ul style="list-style-type: none"> • Sentrong Sigla and PHIC accreditation of RHUs • Non-accreditation of RHUs to Sentrong Sigla & PHIC • Non full coverage of the Provincial Government in the implementation of the NHIP (CHIP) 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • To implement guidelines on Philippine National Drug Formulary (PNDF) • At least 85 percent of the target indigent population have been enrolled in the NHIP to attain universal coverage;

<ul style="list-style-type: none"> • Only 9.54 percent of indigents enrolled under the NHIP • Insufficient allocation for health services among LGUs • Not all RHUs are PHIC- accredited and are not charging user's fee • Local Health Systems: <ul style="list-style-type: none"> - ILHZ not yet operational - Inequitable utilization of health resources - Poor referral system - Poor Health Information system: - Poor Health Management Information System - Inaccurate health data • Delayed surveillance monitoring and evaluation 		<ul style="list-style-type: none"> • To provide sustainable and equitable investments in health care • Not all RHUs are PHIC- accredited and are not charging user's fee • Local Health Systems: <ul style="list-style-type: none"> - ILHZ not yet operational - Inequitable utilization of health resources - Poor referral system - Poor Health Information system: - Poor Health Management Information System - Inaccurate health data • Delayed surveillance monitoring and evaluation
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • To establish an integrated and comprehensive approach to health development to include enhancement of ILHZ capability (support management systems ie. health human resource development system, financial management, Information systems and implementing mechanisms, etc) •

<ul style="list-style-type: none"> • Health Human Resource Management and Development: <ul style="list-style-type: none"> - Some midwives serving 3-5 catchment areas • - Rapid turn-over of manpower • Need for additional school buildings and other educational facilities • Inaccessibility of basic education services and facilities for the poor communities • Lack of an integrated development approach to a focused technical vocational education and training in the provincial/municipal level • Need for accessible and regular scholarship opportunities to deserving students from low-income families • Inadequate housing and settlement • Need to upgrade water system • Inadequate potable water supply in areas not served by water districts • Need to expand coverage of electric services • 	<ul style="list-style-type: none"> • Promote equitable educational opportunities in all areas including conflict-affected areas • Reduction of housing backlog by providing wider housing opportunities • To enhance accessibility of potable water supply • Provision of efficient power services and reliable power supply in the province 	<ul style="list-style-type: none"> • To provide school buildings, educational facilities and services to remote and depressed areas • To institutionalize non-formal education at the local level • To provide scholarship programs for the poor • Assist deserving IP youths to pursue appropriate education • To promote comprehensive shelter program in the LGUs • To encourage NGOs initiatives in the construction of affordable housing units • To improve water supply distribution • Develop and upgrade water supply system in urban centers of Aleosan, Carmen, Arakan and Banisilan • Upgrade existing Barangay Water Systems • To attain 100% electrification coverage to all component sitios of the barangays • To develop other source of power
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<ul style="list-style-type: none"> • Inadequate flood control facilities • Insufficient mechanism for crime and fire prevention • Lack of permanent day care centers in some barangays • Non-functional OSCA in some municipalities • Inactive organizations of PWDs Non-functional MDCCs • Need of rehabilitation centers and separate detention centers for Children In Conflict with Law • Lack of facilities to cater to children in need of special protection 	<ul style="list-style-type: none"> • Provision of adequate flood control systems • Improve and maintain the peace and order situation and public safety at all times • Improved access to social services and facilities 	<ul style="list-style-type: none"> • To protect river banks from scouring • To provide flood control structures in identified priority areas • To improve mobility of police, fire force so as to meet the protective needs of the province • To advocate for awareness and consciousness of the communities on crime and fire prevention techniques/ measures • To encourage active participation of all sectors of the community in crime and fire prevention and suppression • To provide adequate equipment and facilities • To attain 80% coverage of children below 5 years old attending day care • All barangays having permanent Day Care Centers • Full implementation of the Expanded Senior Citizens Act by 2010 • Improve rehabilitation structures and institutions for youth offenders • Improved protection services for children •
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<ul style="list-style-type: none"> • Boundary conflict and Overlapping of AD claims • Presence of other tenurial instrument within the AD claim • Some LGUs non-supportive and has reservation to AD claims • Limited budget allocation for the formulation of ADSDPP • No funding agency to assist the formulation of ADSDPP • Poor access to legal assistance • Intrusion of settlers within AD areas • Land grabbing • Discrimination among ICCs/IPs • Violation of ICCs/IPs human rights • Land conflicts • Exploitation of the Indigenous Knowledge System and Practices (IKSP) • Legislations are inadequate with respect to the protection of the IKSP 	<ul style="list-style-type: none"> • Improved socio-political, cultural and economic services extension to indigenous people in consonance with the IPRA Law 	<ul style="list-style-type: none"> • To properly identify and recognize AD claims of ICCs/lps and delineate or demarcate boundaries between adjacent AD claims and other existing property rights • To formulate a long term master plan/blueprint of IPs total development plan in their respective AD • To improve conflict settlement/legal assistance concerning ICCs/IPs conflicts • Enhanced learning from IKSP
<ul style="list-style-type: none"> • Exploitation of Cultural Community Festivals • Misrepresentation of traditional cultural expressions • Commercialization of indigenous cultures 		<ul style="list-style-type: none"> • Preservation of cultural and historical heritage
Land Use		
<ul style="list-style-type: none"> • Environmental degradation affecting land, air and water • Non-compliance to Land Use and Zonification Plans • Growing settlements in environmentally-critical areas 	<ul style="list-style-type: none"> • Ensure sustainable use of land resources and protection of critical environmental values 	<ul style="list-style-type: none"> • To intensify the rehabilitation of protection lands • Strict implementation of Land Use and Zonification Plans

Table 144. Table on Goals, Objectives and Targets on DRR/CCA

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
Population and Settlements	<p>HYDROMET</p> <p>Flood</p> <p><i>A. Population</i></p> <p>On the exposure of population to flood hazard in the province, more than 500 thousand residents are exposed to flooding in highly susceptible areas.</p> <p>The Municipality of Kabacan registered the highest percentage of 86.35% followed by Pikit with 83.61% and Midsayap with 82.69%. This means that 87.89% of the total population are at risk in times of worst flooding that may hit the province under the high, moderate and low susceptible areas.</p> <p>Midsayap registered the most numbered population exposed to high susceptible areas followed by Pikit and Mlang, respectively. These municipalities are densely populated, low-lying areas and are located along the Rio Grande de Mindanao.</p>	<ul style="list-style-type: none"> Inadequate flood control facilities 	<ul style="list-style-type: none"> Provision of adequate flood control systems 	<ul style="list-style-type: none"> To protect river banks from scouring To provide flood control structures in identified priority areas 	<ul style="list-style-type: none"> Construct flood control dikes and drainage system Construct, repair, rehabilitate and upgrade flood control structures along major river banks and national highways
	<p><i>B. Built-up Areas</i></p> <p>Densely populated and low-lying areas are likely susceptible to flooding.</p> <p>A built-up area of 3,418.40 hectares is exposed to flood hazard. The City of Kidapawan has the biggest area that is exposed to hazard followed by Midsayap and Pigcawayan, respectively.</p>	<ul style="list-style-type: none"> Inadequate housing and settlement 	<ul style="list-style-type: none"> Reduction of housing backlog by providing wider housing opportunities 	<ul style="list-style-type: none"> To promote comprehensive shelter program in the LGUs To encourage NGOs initiatives in the construction of affordable housing units 	<ul style="list-style-type: none"> Intensify socialized housing development programs Identification of site for socialized housing Provide low cost housing assistance to homeless households and squatters living along riverbanks.

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
		<ul style="list-style-type: none"> Lack of LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code at the municipal/barangay level in the province 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code at the municipal level
		<ul style="list-style-type: none"> Riparian law not properly enforced/ implemented 	<ul style="list-style-type: none"> Strict enforcement/ implementation of riparian law 	<ul style="list-style-type: none"> Strict enforcement/ implementation of riparian law 	<ul style="list-style-type: none"> Strict enforcement/ implementation of riparian law Regulation of quarry activities along river banks
		<ul style="list-style-type: none"> Insufficient community-based EWS and lack of access to flood/ rain forecasting information 	<ul style="list-style-type: none"> Improve access of the community to disaster related information 	<ul style="list-style-type: none"> To Establish community-based AWS, ARG, WLMS and access to flood/ rain forecasting for the entire province 	<ul style="list-style-type: none"> Installation of community-based EWS and access to flood/rain forecasting
		<ul style="list-style-type: none"> Lack of disaster preparedness for effective response at the municipal/ barangay level 	<ul style="list-style-type: none"> Improve LGU capacity for disaster preparedness for effective response at the municipal/ barangay level 	<ul style="list-style-type: none"> Improve LGU capacity for disaster preparedness for effective response at the municipal/barangay level in the entire province 	<ul style="list-style-type: none"> Conduct trainings, awareness activities, advocacy in the LGUs Institutionalization of the Local Disaster Risk Reduction & Management Office Formation of the emergency response team
		<ul style="list-style-type: none"> Lack of knowledge, innovation, education and IEC to build culture of safety and resilience at all levels 	<ul style="list-style-type: none"> Use knowledge, innovation, education and IEC to build culture of safety and resilience at all levels 	<ul style="list-style-type: none"> Use knowledge, innovation, education and IEC to build culture of safety and resilience at all levels 	<ul style="list-style-type: none"> Use knowledge, innovation, education and IEC to build culture of safety and resilience at all levels




Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p>C. Critical Infra</p> <p>Banks, churches, government buildings and hospitals are identified as first priority while private & public schools and universities/colleges are considered as second priority.</p> <p>Of the 33 banks, 16 are exposed and located within the high susceptibility areas; 14 under the moderate and 3 within the low susceptibility areas.</p> <p>Out of the 50 churches, 25 are located in the high, 21 in the moderate and 3 in the low susceptibility areas.</p> <p>31 hospitals are identified as exposed to flood hazard in which 19 are in the high susceptible areas, 9 in moderate and 3 in the low susceptible areas.</p>	<ul style="list-style-type: none"> Dilapidated school and hospital building structures Building code are not strictly enforced/ implemented (critical provisions) in all municipalities 	<ul style="list-style-type: none"> Construct, rehabilitate and/or retrofit dilapidated school, hospital building and other structures Strict enforcement/ implementation of building code 	<ul style="list-style-type: none"> To construct/ rehabilitate dilapidated school, hospital building and other structures in high risk areas Strict enforcement/ implementation of building code 	<ul style="list-style-type: none"> Construct, rehabilitate and/or retrofit dilapidated school, hospital building and other structures Strict enforcement/ implementation of building code Conduct micro-zonation and vulnerability assessment of buildings Review of building by-laws and zoning
	<p>D. Agriculture</p> <p>A total of 391,754.87 hectares are classified as agricultural area in the province. 53.71% of the total land areas of the province are exposed to flood hazard.</p> <p>Low-lying areas located along the Ligawasan Marsh are high susceptible to flooding. A total of 117,398.75 hectares are exposed and majority of these areas are within the Municipalities of Midsayap, M'lang and Pikit.</p> <p>On moderate susceptibility, a total of 158,614.46 or 40.48% are exposed to flood hazard in which Carmen, Banisilan and Kidapawan City are greatly affected.</p>	<ul style="list-style-type: none"> Inadequate and/or poor maintenance of drainage/ irrigation structures in agriculture areas for high risk areas Lack of knowledge and application of flood tolerant varieties of agric'l crops Low agricultural production of the area due to flooding 	<ul style="list-style-type: none"> Provide adequate and proper maintenance of drainage/irrigation structures in agriculture areas for high risk areas Increase knowledge and application of flood tolerant varieties of agric'l crops Improve agricultural production 	<ul style="list-style-type: none"> Provide adequate and proper maintenance of drainage/ irrigation structures of the low-lying areas located along the Ligawasan Marsh Increase knowledge and application of flood tolerant - varieties of agricultural crops To minimize damage to properties and crops 	<ul style="list-style-type: none"> Construction/Improvement/ Rehabilitation and proper maintenance of drainage/ irrigation structures in agriculture areas Use of knowledge and application of flood tolerant varieties of agricultural crops Provision of adequate drainage systems in prime agric'l areas prone to flooding

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>E. Lifeline Services</i></p> <p>A total of 102 bridges are identified that are exposed to hazard, 44 of which are located within the high susceptibility area. Bridges in Kabacan, M'lang, Pigcawayan and Tulunan are 100% exposed to hazard.</p> <p>On moderate level, 42 bridges are identified. Bridges in Antipas are 100% exposed to flood hazard.</p> <p>12 bridges are identified within the low level of susceptibility. 100% exposure to hazard are located in Alamada and in Aleosan .</p> <p>16 communication towers are identified of which 10 are within the high susceptibility level, 4 in moderate and 2 in low susceptibility level.</p>	<ul style="list-style-type: none"> • No adequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance • Deteriorated roads and bridges • Lack of alternate routes in high risk areas 	<ul style="list-style-type: none"> • Provide adequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance • Construct, rehabilitate, retrofit deteriorated roads and bridges • Provide alternate routes in high risk areas 	<ul style="list-style-type: none"> • Provide adequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance in high risk areas by CY 2019 • Construct, retrofit, rehabilitate deteriorated roads and bridges in high risk areas • Provide alternate routes in high risk areas by CY 2019 	<ul style="list-style-type: none"> • Construction, Improvement, Rehabilitation of flood control and drainage system along national, provincial, municipal roads and other roads of significant importance • Construct, rehabilitate, retrofit deteriorated roads and bridges • Construction or opening of alternate routes
	<p><u>RAIN-INDUCED LANDSLIDE</u></p> <p><i>A. Population</i></p> <p>The Municipality of Magpet registered a 45.28% highly susceptible to rain-induced landslide. This is followed by the Municipalities of Arakan (35.06%), Alamada (25.15%), Makilala (22.85%) and Pres. Roxas (16.16%).</p> <p>Areas located in higher elevation posed more danger compared to the low-lying areas.</p>	<ul style="list-style-type: none"> • Inadequate slope protection and stabilization measures • Inadequate housing and settlement 	<ul style="list-style-type: none"> • Provide adequate slope protection and stabilization measures • Reduction of housing backlog by providing wider housing opportunities 	<ul style="list-style-type: none"> • Provide adequate slope protection & stabilization measures in high risk areas by 2019 • To promote comprehensive shelter program in the LGUs 	<ul style="list-style-type: none"> • Reforestation, rehabilitation, protection and stabilization measure of affected areas • Intensify socialized housing development programs • Provide housing assistance to affected population • Encourage NGOs to initiate& invest in the establishment or development of affordable housing units

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
		<ul style="list-style-type: none"> Lack of adoption of slope stabilization technologies such as Sloping Agric'l. Land Technology (SALT) in high risk areas 	<ul style="list-style-type: none"> Stabilization of sloping areas especially those that are considered high risk 	<ul style="list-style-type: none"> High risk areas adopting SALT and other slope stabilization technology 	<ul style="list-style-type: none"> Fruit & forest tree growing in sloping areas using SALT Promote the planting of vetiver grass for slope protection
	<p><i>B. Built-up Areas</i></p> <p>The exposure under the high susceptible areas resulted to only 0.59% against the total built-up areas in the province.</p> <p>The total built-up areas of the Municipalities of Alamada, Banisilan and Magpet are 100% exposed to hazard under the moderate level.</p>	<ul style="list-style-type: none"> Lack of LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code at the municipal/barangay level in the entire province 	<ul style="list-style-type: none"> Conduct training/retooling of LGUs
	<p><i>C. Agriculture</i></p> <p>Of the total classified agricultural area of the province, 9.64% fall within the high susceptibility, 52.48% are within the moderate and 7.57% in the low susceptibility.</p> <p>Within the moderate level, the Municipalities of Alamada, Aleosan, Antipas, Arakan, Banisilan and Carmen registered higher percentage in terms of exposure considering these areas are located in higher elevation and are prone to landslides.</p>	<ul style="list-style-type: none"> Inadequate and/or poor maintenance of drainage/irrigation structures in agriculture areas for high risk areas 	<ul style="list-style-type: none"> Protection or decreasing the impact of flooding in production areas that are at high risk 	<ul style="list-style-type: none"> Provide adequate and proper maintenance of drainage/irrigation structures in agriculture areas of the low-lying areas located along the Ligawasan Marsh 	<ul style="list-style-type: none"> Construction/Improvement/ Rehabilitation and proper maintenance of drainage/irrigation structures in agriculture areas

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
		<ul style="list-style-type: none"> • Low agricultural productivity of the area due to flooding 	<ul style="list-style-type: none"> • Minimize damage to properties and crops 	<ul style="list-style-type: none"> • To provide adequate infrastructure support to catalyze economic growth 	<ul style="list-style-type: none"> • Provision of adequate drainage systems in prime agricultural areas that are prone to flooding
	<p><i>D. Critical Infra</i></p> <p><i>Under the first priority, 22 banks are identified as exposed to landslide hazard. 6 banks are within the moderate susceptible areas and 11 banks are within the low susceptible areas.</i></p> <p><i>Most of the structures whether religious, government buildings, hospitals are within the moderate and low-susceptible areas only.</i></p>	<ul style="list-style-type: none"> • Non-compliance with the provisions of the amended building codes 	<ul style="list-style-type: none"> • Providing for safe and disaster resilient infrastructures 	<ul style="list-style-type: none"> • To establish a mechanism that would ensure that new constructions meet current structural and life safety standard 	<ul style="list-style-type: none"> • Strict enforcement of the building code • Retooling of design engineers on earthquake-resilient design guidance for new and existing buildings and lifelines • Improve techniques for evaluating and rehabilitating existing buildings
	<p><i>E.Lifeline Services</i></p> <p>Bridges exposed to hazard registered a 73.19%. Of these, 11.88% are within the high susceptibility level, 61.39% moderate and 26.73% within low susceptibility level.</p> <p>Bridges located in Alamada, Aleosan and Antipas are 100% exposed to moderate level of landslide.</p>	<ul style="list-style-type: none"> • Deteriorated roads and bridges 	<ul style="list-style-type: none"> • Construct, rehabilitate, retrofit deteriorated roads and bridges 	<ul style="list-style-type: none"> • Construct, retrofit, rehabilitate deteriorated roads and bridges in high risk areas 	<ul style="list-style-type: none"> • Construct, rehabilitate, retrofit deteriorated roads and bridges

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p>There are 9 communication towers in the province. Of these, 3 towers in Makilala are 100% exposed to moderate susceptible landslide hazard while the tower in Kidapawan City is considered within the low susceptible level.</p> <p>Of the 6 electric utilities in the province, 4 units are considered exposed to hazard. 3 under the moderate (Kidapawan, Makilala&Matalam) and 1 under the low susceptibility located in Kidapawan.</p> <p>277.36 kilometers of all-weather provincial roads are considered exposed to hazard. 27.56 kms are within the high susceptible areas, 212.89 kms under the moderate and 56.91 kms within the low susceptible areas.</p>	<p>Inadequate slope protection and stabilization measures along roads</p> <ul style="list-style-type: none"> • Inadequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance 	<ul style="list-style-type: none"> • Provide adequate slope protection and stabilization measures along roads • Provide adequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance 	<p>Provide adequate slope protection and stabilization measures along roads in high risk areas</p> <ul style="list-style-type: none"> • Provide adequate flood control and drainage system along national, provincial, municipal roads and other roads of significant importance in high risk areas by 2019 	<ul style="list-style-type: none"> • Construction/Improvement/ Rehabilitation of slope protection and stabilization measures along roads • Construction, Improvement, Rehabilitation of flood control and drainage system along national, provincial, municipal roads and other roads of significant importance

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies		
	<p><u>GEOLOGIC HAZARD</u> <u>Groundshaking</u></p> <p>A. Population</p> <p>The entire population of the Municipalities of Aleosan and Mlang are 100% exposed to the phenomenon if ever the province will be hit by an earthquake.</p> <p>The population of the Municipalities of Midsayap and Tulunan will also be greatly affected. Only the Municipality of Arakan and its population will be spared from the exposure.</p> <p>Almost a million individuals of the entire population of the province will be exposed to groundshaking.</p> <p>B. Built-up Areas</p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ol style="list-style-type: none"> 1. Aleosan 2. Kidapawan 3. Libungan 4. Carmen 5. Kabacan 6. Mlang 7. Matalam 8. Midsayap 9. Tulunan 10. Pigcawayan </td> <td style="vertical-align: middle; text-align: center;">  <p>100% exposure to groundshaking</p> </td> </tr> </table> <p>Of the total estimated built-up areas in the province (3,418 hectares), 84.42% will be exposed to groundshaking.</p> <p>The above-mentioned municipalities/city will be totally affected while built-up areas of the municipalities located in a higher elevation are free from exposure.</p>	<ol style="list-style-type: none"> 1. Aleosan 2. Kidapawan 3. Libungan 4. Carmen 5. Kabacan 6. Mlang 7. Matalam 8. Midsayap 9. Tulunan 10. Pigcawayan 	 <p>100% exposure to groundshaking</p>	<ul style="list-style-type: none"> • Unpredictability of the occurrence on earthquake. • Lack of capacity and opportunity of some vulnerable communities to move out. 	<ul style="list-style-type: none"> • Protection of persons and properties from adverse effects of earthquake 	<ul style="list-style-type: none"> • To improve the earthquake resilience of communities by increasing public awareness of earthquake hazards and risks • To relocate vulnerable communities out of harm's way 	<ul style="list-style-type: none"> • Conduct continuous disaster preparedness and hazard awareness advocacy to the communities • Provide public education and training about earthquakes and other natural and man-made disasters • Enforce site-specific seismic design category requirements to minimize earthquake damage. • Require minimum setbacks for housing construction along riverbanks, based upon the susceptibility of the bank to groundshaking. • Allocate funds for the establishment of relocation site for vulnerable communities
<ol style="list-style-type: none"> 1. Aleosan 2. Kidapawan 3. Libungan 4. Carmen 5. Kabacan 6. Mlang 7. Matalam 8. Midsayap 9. Tulunan 10. Pigcawayan 	 <p>100% exposure to groundshaking</p>						

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>C. Critical Infra</i></p> <p>Infrastructures such as banks, church, communication towers, electric utilities, hospitals, government buildings are considered as Priority 1 prone to the hazard.</p> <p>Of the 33 identified banking institutions, 32 of which are 100% exposed to groundshaking.</p> <p>A total of 106 bridges are identified, 77 are exposed; 48 churches out of the 49 are also exposed; all 14 units of communication towers are exposed; 6 of the 7 electric utilities are exposed; 13 of the 19 government buildings and 30 of the 31 hospitals are exposed to the hazard, respectively.</p> <p>Under Priority 2, the following are exposed to hazard:</p> <ul style="list-style-type: none"> - 57 private school buildings out of the 64 identified - 91 public high school buildings out of 137 - 396 public elementary out of 610 - 16 universities/colleges out of 18 - 12 public market buildings out of 18 	<ul style="list-style-type: none"> • Non-compliance with the provisions of the amended building codes 	<ul style="list-style-type: none"> • Providing for safe and disaster resilient infrastructures 	<ul style="list-style-type: none"> • To establish a mechanism that would ensure that new constructions meet current structural and life safety standard 	<ul style="list-style-type: none"> • Strict enforcement of the building code • Retooling of design engineers on earthquake-resilient design guidance for new and existing buildings and lifelines • Improve techniques for evaluating and rehabilitating existing buildings

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>D. Agriculture</i></p> <p>58.10% of the estimated agricultural areas of the province are exposed to groundshaking. The municipalities located in the low-lying areas are the most affected by groundshaking.</p> <p>Municipalities located in higher elevation are not exposed or have less exposure to groundshaking.</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
	<p><i>E. Lifeline Services</i></p> <p>Of the total all-weather barangay roads in the province, 79.46% are exposed to groundshaking.</p> <p>Barangay roads in the Municipalities of Aleosan, Kabacan, Mlang, Midsayap, Pigcawayan&Tulunan are 100% exposed to groundshaking if ever an earthquake will hit the province. Barangay roads in Arakan, Antipas & Banisilan are free from exposure.</p>	<ul style="list-style-type: none"> • Building standards and code are not strictly enforced/ implemented (critical provisions) in all municipalities • Some buildings are old and dilapidated and are vulnerable to groundshaking 	<ul style="list-style-type: none"> • Prevent loss of lives and minimize property damages resulting from the impact of ground shaking 	<ul style="list-style-type: none"> • To ensure that infrastructures are resilient & adhering or conforming to the standards in the building code. 	<ul style="list-style-type: none"> • Classify infrastructures or structures according to their vulnerability. Based on this classification, recommend for either retrofitting or demolition.

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p>Of the total municipal all-weather roads, 94.97% are exposed to hazard. A 100% exposure to hazard are roads in Kidapawan City and in the Municipalities of Aleosan, Carmen, Kabacan, Mlang, Makilala, Matalam, Midsayap and Tulunan.</p> <p>Provincial roads in Aleosan, Matalam, Midsayap, Mlang, Pigcawayan, Pikit, Pres. Roxas&Tulunan are 100% exposed to groundshaking.</p>		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	
	<p><u>Earthquake-induced Landslide</u></p> <p><i>A. Population</i></p> <p>The municipalities that are greatly exposed to earthquake-induced landslide are those under the low susceptible areas and located in higher elevations like Magpet, Arakan and Alamada.</p> <p>Only 11.24% of the total population of the province under the low susceptibility level are exposed to the hazard.</p>	<ul style="list-style-type: none"> • Unpredictability of earthquake 	<ul style="list-style-type: none"> • Minimize risk to the community from seismic activity and geologic conditions including ground shaking, fault rupture, slope stability, liquefaction and landslides. • Protect people and property from seismic hazards 	<ul style="list-style-type: none"> • Protect life, provide safety, and substantially reduce the potential level of property damage from landslides 	<ul style="list-style-type: none"> • Identify areas susceptible to erosion and sediment loss. • Investigate specific geologic conditions underlying all new development or redevelopment proposals in areas where potential fault rupture, liquefaction, slope instability or other geological hazards are suspected. • Prohibit introduction of infrastructures in areas with high landslide susceptibility

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>B. Built-up Areas</i></p> <p>Some of the exposed built up areas are located within low susceptible areas to landslide</p>	<ul style="list-style-type: none"> Lack of LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code 	<ul style="list-style-type: none"> Improve LGU capacity to monitor compliance of building standards and code at the municipal/barangay level in the entire province 	<ul style="list-style-type: none"> Retooling of design engineers on earthquake-resilient design guidance for new and existing buildings and lifelines
	<p><i>C. Critical Infra</i></p> <p>In low lying areas, earthquake-induced landslides do not pose damages to the identified infrastructures like banks, communication towers, hospitals, public market building and universities and colleges</p> <p>Major damages will most likely occur in the municipalities of Alamada, Arakan, Aleosan, and Kidapawan City.</p>	<ul style="list-style-type: none"> Non-compliance with amended building codes 	<ul style="list-style-type: none"> Develop tools to improve the seismic performance of critical infrastructure 	<ul style="list-style-type: none"> Develop tools to improve the seismic performance of critical infrastructure Assure that new construction meets current structural and life safety standard 	<ul style="list-style-type: none"> Amend building code requirements to meet seismic performance goals Develops and disseminates earthquake-resistant design guidance for new and existing buildings and lifelines and aids in the development of performance-based design guidelines and methods. Improve techniques for evaluating and rehabilitating existing buildings
	<p><i>D. Agriculture</i></p> <p>Municipalities that are located in elevated areas like Magpet, Aleosan and Alamada are highly exposed to earthquake-induced landslide.</p> <p>Only 11.89% of the total agricultural area of the province will be affected by the hazard if ever.</p>	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>E. Lifeline Services</i></p> <p>Only 7.51% of the total barangay road network under the low susceptibility level may be affected by the hazard.</p> <p>The hazard will only give minimal damages on municipal roads in all level.</p> <p>On national roads – both concrete and all-weather will also be affected but on a very minimal level only.</p>				
	<p><u>Liquefaction</u></p> <p><i>A. Population</i></p> <p>Liquefaction is estimated to affect 32.93% of the total population under the high susceptible areas; 14.76% under the moderate and 14.58% under the low susceptibility level.</p> <p>High percentage of the population in Mlang, Pikit&Kabacan are exposed under the high susceptibility level; Matalam, Pigcawayan&Aleosan under the moderate while Aleosan, Pres. Roxas&Pigcawayan on the low-susceptibility level.</p>	<ul style="list-style-type: none"> • Although vulnerable areas are already identified, the information is not yet disseminated to the concerned communities 	<ul style="list-style-type: none"> • Protection of vulnerable communities 	<ul style="list-style-type: none"> • To provide reliable and up to date information to the communities for them to make informed-decisions 	<ul style="list-style-type: none"> • Conduct information, education campaign to vulnerable communities

Sector	Risk Evaluation	Issues/Problems	Goals	Objectives/Targets	Policies/Strategies
	<p><i>B. Built-up Areas</i></p> <p>Only 0.52% of the total land area of the province is the total built-up area of which, 30.16% are exposed to hazard under the high susceptibility level; 18.19% under the moderate and 12.54% are exposed under the low susceptibility level.</p> <p>High percentage of areas affected are in Kabacan, Mlang & Tulunan under the high susceptibility level; Libungan & Pigcawayan under the moderate level and Aleosan, Matalam & Midsayap under the low susceptibility level.</p>	<ul style="list-style-type: none"> Although vulnerable areas are already identified, the information is not yet disseminated to the concerned communities 	<ul style="list-style-type: none"> Protection of vulnerable communities and properties 	<ul style="list-style-type: none"> To reduce structural and non-structural hazards to life safety and minimize property damages resulting from disasters 	<ul style="list-style-type: none"> Consider site soils condition when reviewing projects in areas subject to liquefaction or slope stability Do retrofitting of structures that are located in risky areas
	<p><i>C. Critical Infra</i></p> <p>The phenomenon will also give 100% damages to hospitals in Kabacan, M'lang and Tulunan, private schools in Carmen, Kabacan and M'lang, universities and colleges in KabacanMatalam and Midsayap, and Public markets in Kabacan, Matalam and M'lang.</p> <p>Under the moderate susceptible areas, 100% damages will also happen to banks in Libungan, churches in Midsayap and Carmen, government buildings in Libungan and Midsayap, hospital in Libungan, college building in Libungan and public markets in Carmen, LibunganMidsayap and Pigcawayan.</p> <p>In low susceptible areas, government buildings in Aleosan, Kidapawan, hospital in Aleosan, private school in Pres. Roxas, universities and colleges in Aleosan and Midsayap and the public marker in Aleosan will be totally damaged if ever liquefaction will happen in the province.</p>	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

	<p>d. Lifeline Services</p> <p>Liquefaction may have 100% exposure on gravel-all weather barangay roads in Pikit, Kabacan and M'lang under the high susceptibility level, Pigcawayan under the moderate level and Aleosan under the low susceptibility level.</p> <p>Municipal roads may also be totally damaged in Kabacan, Matalam, M'lang and Tulunan under the high level, Midsayap under the moderate and Aleosan under the low level.</p> <p>For the provincial roads, Pikit (91.19%) and Midsayap (89.44%) will be greatly affected under the high susceptibility level, Matalam (66.19%) under the moderate and total damaged in Pres. Roxas under the low level.</p> <p>National roads – gravel-all weather in M'lang (75.14%) may be affected in high level but very minimal effect under the moderate and low susceptibility levels while on national-concrete roads, total damaged is expected in Kabacan under the high susceptibility level, Pigcawayan (72.37%) under the moderate and Aleosan (83.76%) under the low level.</p> <p>For NIA roads, the expected total damages will be in Carmen and Kabacan under the high level and Libungan (92.54%) and Midsayap (95.46%) under the low level.</p>				
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