

2021 MIMAROPA Regional Development Report (RDR)
Chapters 02, 08, 09, 14, and 20

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Via Zoom

Chapter 08

Expanding Economic Opportunities in Agriculture, Forestry, and Fisheries

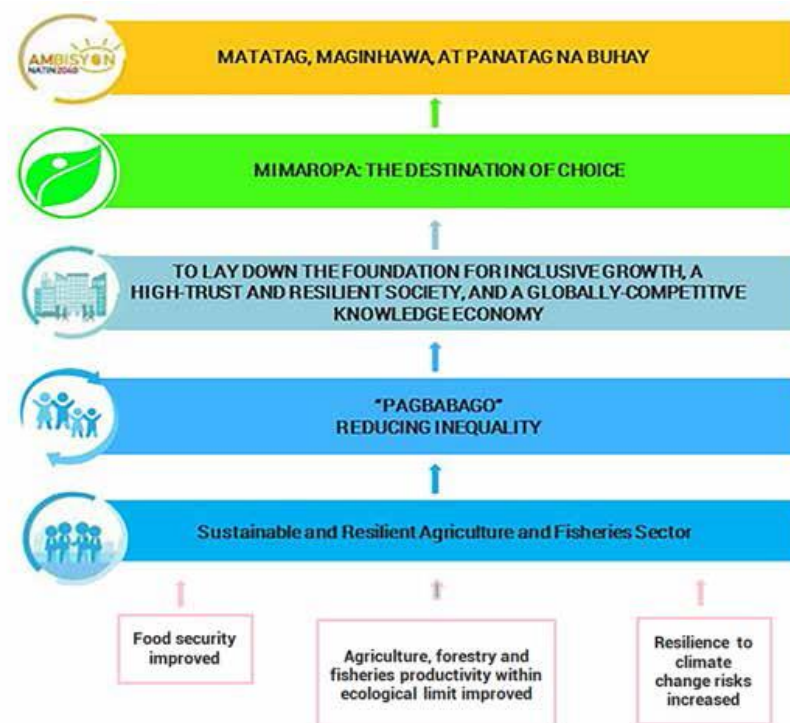
a. Abstract

The Agriculture, Forestry, and Fisheries (AFF) sector is one of the primary growth drivers of the MIMAROPA economy. It continues to contribute to the country's goal of food security as MIMAROPA is known as one of the top producers of rice, corn, cashew, calamansi, onion, garlic, and fishery products.

Production of major commodities in the region generally increased in 2021. The increase may be attributed to efforts of farmers, stakeholders, and government agencies to bounce back better after the beginning of the COVID-19 pandemic with all its accompanying restrictions and the onset of Typhoon Odette that severely affected MIMAROPA, especially the province of Palawan.

Based on the MIMAROPA Regional Development Plan (RDP) 2017-2022 Midterm Update, the desired outcomes for the AFF are: (a) Sustainable Growth in Agriculture and Fisheries Achieved, (b) Food Security Improved, (c) Sector Resilience to Climate Change Improved, and (d) Rural Income Increased.

This chapter discusses the performance of the AFF sector in the region and its contribution to the attainment of the development goals set in the MIMAROPA RDP 2017-2022 Midterm Update.



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b. Accomplishments

Achieving Sustainable Growth in Agriculture and Fisheries

At constant 2018 prices, MIMAROPA's economy declined by 7.6% in 2020 compared to 4.3% growth in 2019. AFF decreased by 2.2% in 2020 from 4.7% growth in 2019. Industry declined by 8.2% in 2020 compared with 2.2% in previous year due to continued decline in construction, mining, quarrying, and manufacturing.

The services sector accounted for the largest share in the region's economy with 45.6%. This was followed by the industry sector with 35.2% and the AFF sector with 19.2%.

The decrease in the growth of the AFF sector in MIMAROPA can be associated to the COVID-19 pandemic. The onset of the pandemic resulted in the limited movement of workers and agricultural products especially during the early stages of the enhanced community quarantine (ECQ). This, combined with the archipelagic nature of the region, resulted in the oversupply of some crops such as watermelon and melon which further resulted to the lower market price of these products. There was also an increase in the distribution cost of products due to impositions of local policies. Based on the business rapid assessment survey for AFF sector, the estimated direct losses from unsold agricultural produce in the region was at least ₱1.5 million. Almost 50% of the incurred losses were from cereals.

Improving Food Security

Self-Sufficiency ratio of the major commodities increased except mango, garlic, and onion. The decrease in self-sufficiency levels of mango, garlic, and onion may be attributed to the imposition of community quarantines during the first semester of 2021 that later turned into alert levels where movement within and without the MIMAROPA provinces was being controlled by strict regulations.

Self-Sufficiency Ratio measures the magnitude of production in relation to regional utilization. It is the extent to which a region's supply of commodities is derived from its local production or the extent to which a region relies on its own production resources. The higher the ratio, the greater the self-sufficiency of the agricultural commodities in the area. The following are the performances of the region's major agricultural commodities in terms of self-sufficiency ratio:

- Rice self-sufficiency level increased by 22.6 percentage points from 157.68% self-sufficiency in 2020 to 180.28% self-sufficiency in 2021. The RDP target of 175.53% was surpassed. All MIMAROPA provinces registered an increase in rice self-sufficiency levels except Oriental Mindoro that recorded a decrease of 7.41 percentage points from 224.41% in 2020 to 217% in 2021. Occidental Mindoro remains the most rice self-sufficient province in MIMAROPA with 295%, followed by Oriental Mindoro at 217% and Palawan at 151%.

- Banana self-sufficiency level significantly increased by 242.96 percentage points from 46.04% sufficiency level in 2020 to 289% in 2021. Banana achieved 507.73% of its target of 56.92%.
- Calamansi self-sufficiency level slightly increased by 1 percentage point from 302% in 2020 to 303% in 2021. However, the RDP target for calamansi self-sufficiency level of 1,932.51% was not achieved.
- Mango self-sufficiency decreased by 31.41 percentage points from 61.41% in 2020 to 30% in 2021, and did not achieve the 2021 RDP target of 41.03%.
- Garlic self-sufficiency level decreased by 5.67 percentage points from 17.47% in 2020 to 11.8% in 2021, and did not achieve its RDP target set at 161.15%.
- Onion self-sufficiency significantly decreased by 138.61 percentage points from 251.61% in 2020 to 113% in 2021. Onion was able to achieve its RDP target by 160.92%.
- Chicken self-sufficiency level increased by 31.81 percentage points from 34.24% in 2020 to 66.05% in 2021, also achieving its RDP target by 153.96%.
- Beef self-sufficiency level significantly increased by 184.64 percentage points from 59.54% in 2020 to 244.18% in 2021 and surpassed the 2021 RDP target by 115.53%.
- Pork self-sufficiency level significantly increased by 180 percentage points from 162.34% in 2020 to 342.24% in 2021, and was able to surpass its RDP target by 407%.
- Chevron self-sufficiency level significantly increased by 153.82 percentage points from 262.63% in 2020 to 416.45% in 2021, surpassing the RDP target for 2021 by 399%.

Production of most crops increased in 2021. The volume of crops production slightly increased by 1.30% from 2.63 million MT produced in 2020 to 2.66 million MT in 2021. However, only production of cashew, mango, cacao, and onion surpassed their 2021 RDP targets.

- Palay production in MIMAROPA slightly increased by 3.56%, from 1.18 million MT in 2020 to 1.23 million MT in 2021. This was, however, lower than the 2021 RDP target of 1.32 million MT for palay production. Among all the MIMAROPA provinces, Palawan and Oriental Mindoro were the major producers of palay contributing 33.32% and 32.21%, respectively. Palay yield in the region slightly decreased by 1.98% and fell short of the 2021 RDP target of 4.30 MT/ha. MIMAROPA contributed 6.14% to the national output and ranked 7th among other regions.
- Corn production also missed the RDP target for 2021 of 139,469.77 MT registering also a decrease in production by 4.87% from 121,201.15 MT in 2020 to 115,297.47 MT in 2021. Corn yield, on the other hand, increased by 2.51% from 3.98 MT/ha in 2020 to 4.08 MT/ha in 2021. Occidental Mindoro remains the biggest producer of corn in the region with a share of 76.43%. Production of yellow corn decreased by 2.14% from 105,467.99 MT in 2020 to 103,208.04 MT in 2021. The production

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of white corn significantly decreased by 23.16% from 15,733.16 MT in 2020 to 12,089.43 MT in 2021. These were also lower than the RDP targets for 2021. MIMAROPA contributed 1.4% to the national output and ranked 13th among other regions.

- Banana production increased by 7.72% from 62,574.73 MT in 2020 to 67,404.95 MT in 2021. This, however, fell short of the 2021 RDP target set at 101,347.46 MT. Palawan and Oriental Mindoro were the major contributors to banana production in the region with shares of 54.81% and 32.82%, respectively. The region's banana yield decreased from 4.72 MT/ha to 2.74 MT/ha. Saba remains the dominant banana variety being produced in MIMAROPA with a 63.31% share to the total banana production.
- Calamansi production increased by 9.73% from 35,382.35 MT in 2020 to 38,825.89 MT in 2021. This was lower than the 2021 RDP target of 43,230.99 MT. Calamansi yield of 5.39 MT/ha was lower than the RDP target of 6.43 MT/ha. All MIMAROPA provinces recorded a decrease in production. Oriental Mindoro continues to be the highest producer of calamansi in the region with a share of 96.77%.
- Coconut production in the region slightly increased by 5.79% from 759,368.93 MT in 2020 to 803,357.35 MT in 2021. This was however lower than the 2021 RDP target of 840,245.90 MT of coconut. The coconut yield of 3.39 MT/ha was slightly lower than the RDP target of 3.78 MT/ha. All MIMAROPA provinces recorded decreases in coconut production except for Palawan which registered an increase of 4.99% from 409,832.98 MT in 2019 to 430,283.74 MT in 2020.
- The volume of cashew nuts produced in the region exceeded the 2021 RDP target as its production increased by 0.53% from 249,023.78 MT in 2020 to 250,346.43 MT in 2021. Cashew nuts yield of 9.15 MT/ha was higher than the 2019 yield of 8.98 MT/ha, this can be attributed to the increase in area harvested in 2020. Palawan remains the biggest producer of cashew nuts and contributed 99.92% or 248,817.68 MT to the total cashew nut production in the region.
- Mango production increased by 17.02% from 18,085.66 MT in 2020 to 21,163.04 MT in 2021 and significantly exceeded the 2021 RDP target by 126%. Mango yield also increased from 4.91 Mt/ha in 2019 to 5.21 MT/ha in 2020 exceeding the RDP target of 4.59 MT/ha. Palawan was the highest producer of mango contributing 85.18% share to the total mango production of the region.
- Garlic production in the region significantly decreased by 69.35% from 1,149.51 MT in 2020 to 352.32 MT in 2021. The 2021 RDP target for garlic production was not achieved. All MIMAROPA provinces recorded a decrease in production except Romblon that registered a 0.17% increase in outputs. Garlic yield decreased from 6.15 MT/ha in 2019 to 5.37 MT/ha in 2020 and did not achieve the RDP target of 6.90 MT/ha. Occidental Mindoro is still the biggest producer of garlic in the region contributing 91.60% to the total garlic production in MIMAROPA.

- Onion production in the region significantly increased by 43.97% from 33,629.85 MT produced in 2020 to 48,418.52 MT produced in 2021. All MIMAROPA provinces registered decreases in onion production. Occidental Mindoro remains the top onion producer among all MIMAROPA provinces and contributed 94.02% to the region's total onion production. Onion yield slightly decreased from 10.14 MT/ha in 2019 to 10.01 MT/ha in 2020, however, this was still higher than the 2020 RDP target of 9.17 MT/ha yield of onion. The decrease in onion production was associated with the increase of area harvested in 2019 of about 1,194.98 hectares.
- Cacao production increased by 28.78% from 105.23 MT in 2020 to 135.52 MT in 2021 exceeding the 2021 RDP target of 92.28 MT cacao production. Cacao yield of 0.37 MT/ha in 2020 did not meet the RDP target of 0.74 MT/ha. Palawan was the highest producer of cacao in the region and contributed 83.54% to the total cacao production.
- The region's cassava production also increased by 12.36% from 19,260.38 MT produced in 2020 to 21,641.58 MT produced in 2021. However, the RDP target for cassava production was not met. Cassava yield slightly decreased from 7.74 MT/ha in 2019 to 7.44 MT/ha in 2020 and did not achieve the 2020 RDP target of 8.24 MT/ha.
- Production of vegetables including ampalaya, eggplant, gabi, kangkong, monggo, okra, pechay, radish, string beans, tomato, cabbage, and squash registered a slight increase of 0.28% from 24,415.21 MT produced in 2019 to 24,484.70 MT produced in 2020. However, vegetable yield decreased from 4.64 MT/ha in 2019 to 4.46 MT/ha in 2020 and did not meet the RDP target of 5.04 MT/ha.

In general, the total area harvested in 2020 was higher by 0.57% than the area harvested in 2019. However, the volume of production of most crops decreased by 5.01% from 2.64 million MT in 2019 to 2.51 million MT in 2020; the reason for the decrease in the yield of most crops.

Production of livestock and poultry commodities increased in 2021. The livestock volume of production increased by 14.96% from 95,650.30 MT produced in 2020 to 109,959.53 MT in 2021. Poultry production reached 21,013.02 MT and exceeded the 2021 RDP target of 19,651.69 MT.

- Carabao production increased by 11.74% from 4,778 MT in 2020 to 5,339 MT in 2021. This was, however, lower than the 2021 RDP target set at 6,056.90 MT carabao production. Cattle production also increased by 25% from 8,652.27 MT in 2020 to 10,812.71 MT in 2021, but failed to achieve the 2021 RDP target.
- Hog production increased by 14.93% from 79,794 MT produced in 2020 to 91,710 MT in 2021. This also exceeded the 2021 RDP target set at 86,631.18 MT hog production. Goat production, on the other hand, decreased by 13.55% from 2,426 MT in 2020 to 2,097 MT in 2021. The 2021 RDP target of 2,402 MT for goat production was not met.

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- Chicken production increased by 5.16% from 10,905 MT produced in 2020 to 11,468 MT produced in 2021. The RDP target for 2021 on chicken production was not met. Chicken eggs production, on the other hand, achieved 120% of its 2021 RDP target.
- Duck and duck eggs production both increased by 14.73% and 31.97%, respectively. The 2021 RDP targets for both duck and duck eggs production were achieved.

Fish production for most fishing types increased except for aquaculture. The total fisheries production in the region reached 377,986.29 MT in 2021. This was way lower than the RDP target for the year of 578,608.67 MT.

- Commercial fisheries production slightly increased by 7.59% from 28,200.02 MT in 2020 to 30,340.23 MT. The slow increase in commercial fish production may be attributed to the decrease in fishing days and trips. All MIMAROPA provinces recorded decreases in commercial fisheries production except for the Mindoro provinces. Palawan remains the top producer of commercial fish products contributing 64.86% to the region's total production.
- Municipal fisheries production increased by 6.58% from 113,433.24 MT produced in 2020 to 120,893.37 MT in 2021. However, the 2021 RDP target set at 137,875.09 MT municipal fisheries production was not achieved. All provinces recorded increases in production; Occidental Mindoro registered 21.06%, Oriental Mindoro 10.12%, Palawan 6.37%, and Romblon 0.28%. Only the province of Marinduque recorded a decrease of 6.53% during the year.
- Aquaculture production in the region decreased by 29.80% from 323,024.30 MT in 2020 to 226,752.69 MT in 2021 and this was lower than the 2021 RDP target set for aquaculture production. All MIMAROPA provinces registered increases in aquaculture production except for Palawan and Marinduque that registered a decrease of 30.07% and 17.53%, respectively. Nevertheless, Palawan remains the top producer of aquaculture products (seaweeds) with a share of 99%. MIMAROPA contributed 16.69% to the national output and ranked 2nd after the ARMM in seaweed production.

Improving AFF Sector Resilience to Climate Change

The 2021 RDP target for agri and fishery production loss due to weather and climate related disasters set at ₱368 million was not achieved. The onslaught of typhoon Odette on December 17, 2021 caused a total of Php1.08 billion worth of damages to AFF in the province of Palawan. Fisheries recorded the highest estimated cost of damages amounting to Php814.89 million. This was followed by damages to crops with Php213.21 million, irrigation facilities with Php33.43 million, and agricultural assets including agricultural lands and storage buildings, among others with Php15.93 million. On the other hand, the total estimated losses to the subsector amounted to Php1.80 billion. The

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crops subsector incurred the highest losses amounting to Php1.30 billion. This includes losses incurred by cashew estimated at Php846.50 million, banana with Php169.07 million, and fruits with Php94.23 million.

Table 8.1. Damages and losses in agriculture and fisheries subsector by item, Palawan

Sub-sector/Item	Damages (in Php)	Losses (in Php)
Crops	213,209,474.29	1,298,410,589.89
Rice	45,449,914.29	97,743,910.00
Corn	346,460.00	835,640.00
Cashew	0.00	846,492,143.31
Fruit	0.00	94,229,106.05
Vegetable	0.00	41,170,390.00
Banana	0.00	169,072,328.93
Rubber	0.00	5,092,500.00
Coconut	166,584,100.00	42,982,571.60
Abaca	829,000.00	792,000.00
Livestock	0.00	49,271,912.40
Large Ruminant	0.00	26,843,520.00
Small Ruminant	0.00	6,301,890.00
Swine	0.00	14,889,600.00
Other Livestock	0.00	1,236,902.40
Poultry	0.00	13,370,186.10
Fisheries	814,894,414.58	435,738,911.00
Municipal	372,175,913.00	163,732,140.00
Commercial	0.00	0.00
Aquaculture	442,718,501.58	272,006,771.00
Irrigation Facilities	33,425,682.76	120,000.00
SRIP	16,694,991.03	0.00

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SIP	956,991.73	0.00
CIS	4,973,700.00	0.00
RIS	10,000,000.00	120,000.00
SPIS	800,000.00	0.00
Agricultural Assets	15,934,000.00	0.00
Physical Assets	15,934,000.00	0.00
Equipment and Machineries	0.00	0.00
TOTAL	1,077,463,571.63	1,796,411,599.39

Source: 2nd Draft Palawan RRP for Areas Affected by Typhoon Odette

The livestock and poultry subsectors did not incur any damage. However, the gravity of the impact of Typhoon Odette was evident in the livestock and poultry subsector that incurred estimated loss amounting to Php62.64 million.

The fisheries subsector incurred the heaviest damage under the agriculture and fisheries subsector. This was estimated at Php814.89 million, of which a total of Php372.18 million was accounted to damages to municipal fisheries and Php442.72 million to aquaculture fisheries.

The estimated damages to irrigation facilities amounted to Php33.43 million.

Table 8.2. Results Matrix for Expanding Economic Opportunities in Agriculture, Forestry, and Fisheries

Indicator	Baseline	Targets		Accomplishment 2021	Reporting Entity
	2016	2021	2022		
GVA in AFF increased (in percent)	-6.8	2.0% (low) 3.0% (high)	2.0% (low) 3.0% (low)	Data not yet available	PSA
crops	-6.54	2.50	2.50		PSA
livestock	2.75	2.50	2.50		PSA
poultry	-3.26	2.50	2.50		PSA
Fishery	-14.51	2.50	2.50		
crops	-7.01	2.50	2.50		PSA
livestock	2.23	2.50	2.50		PSA
poultry	-3.75	2.50	2.50		PSA
fisheries	-14.94	2.50	2.50		PSA
Commercial Fisheries ('000)	1,714.73	1,838.01	1,874.77	1,933.07	PSA

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Indicator	Baseline	Targets		Accomplishment 2021	Reporting Entity
	2016	2021	2022		
Municipal Fisheries ('000)	7,756.15	8,313.81	8,480.09	10,631.92	PSA
Aquaculture ('000)	1,808.21	1,938.22	1,976.99	2,165.62	PSA
Rice self-sufficiency level maintained (%)	151.56	175.73	180.13	180.28	DA
Banana (%)	17.12	56.92	76.84	289	DA
Calamansi (%)	1,576.91	1,932.51	1,990.49	303	DA
Cashew (%)	7,445.35	7,976.85	8,216.15		DA
Mango (%)	13.64	41.03	55.39	30	DA
Garlic (%)	113.61	161.15	169.21	11.8	DA
Onion (%)	23.86	70.22	84.27	113	DA
Chicken (%)	24.93	42.9	57.91	66.05	DA
Beef (%)	215.43	211.35	217.69	244.18	DA
Pork (%)	112.50	84.09	90.00	342.24	DA
Chevon (%)	182.36	104.29	114.72	416.45	DA
Palay	3.75	4.30	4.40	3.96	PSA
Corn	3.27	3.72	3.81	4.08	
White Corn	2.31	2.48	2.54	2.33	PSA
Yellow Corn	4.23	4.95	5.07	4.48	PSA
Banana	4.31	4.49	4.61	Data not yet available	PSA
Calamansi	6.44	6.59	6.75		PSA
Coconut	3.53	3.87	3.96		PSA
Cashew Nuts	0.80	0.90	0.93		PSA
Mango	4.18	4.71	4.83		PSA
Garlic	6.23	7.07	7.25		PSA
Onion	8.64	9.38	9.63		PSA
Vegetables	4.06	5.17	5.30		PSA
Cacao	0.74	0.76	0.78		PSA
Coffee - dried berries	0.18	0.19	0.20		
Cassava	7.03	8.45	8.66		PSA
Volume of Crop Production	2,511,652.00	2,850,136.27	2,921,389.67		PSA

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Indicator	Baseline	Targets		Accomplishment 2021	Reporting Entity
	2016	2021	2022		
Palay	1,080,408.00	1,319,173.30	1,352,152.63	1,225,283.21	PSA
Corn	114,604.00	139,469.77	142,956.51	115,297.47	PSA
White Corn	17,287.00	16,556.12	16,970.02	12,089.43	PSA
Yellow Corn	97,317.00	122,913.65	125,986.49	103,208.04	PSA
Banana	97,993.93	101,347.46	103,881.15	67,404.95	PSA
Calamansi	42,315.15	43,230.99	44,311.77	38,825.89	PSA
Coconut w/ husk	758,748.45	840,245.90	861,261.27	803,357.35	PSA
Cashew nuts	209,378.90	234,429.50	240,290.30	250,346.43	PSA
Mango	14,939.10	16,749.72	17,168.46	21,163.04	PSA
Garlic Dried Bulb (MT)	1,818.84	1,869.28	1,915.99	352.32	PSA
Onion (MT)	14,664.58	21,107.39	21,635.07	48,418.52	PSA
Cacao (MT)	84.26	92.28	94.59	135.52	PSA
Coffee - dried berries (MT)	166.73	175.59	179.98		PSA
Cassava (MT)	19,888.18	23,802.72	24,397.79	21,641.58	PSA
Vegetables (Ampalaya, Eggplant, Gabi, Kangkong, Monggo, Okra, Pechay, Radish, Stringbeans, Tomato, Cabbage, Squash) (including other crops) (MT)	69,310.28	82,617.90	84,683.34		PSA
Volume of Livestock Production	100,712.00	108,138.94	110,842.41	109,959.53	PSA
Carabao (MT)	6,169.00	6,056.90	6,208.32	5,338.77	PSA
Cattle (MT)	12,466.00	13,048.25	13,374.46	10,812.71	PSA
Swine (MT)	79,585.00	86,631.18	88,796.95	91,710.58	PSA
Goat (MT)	2,492.00	2,402.61	2,462.68	2,097.47	PSA
Volume of Poultry Production	16,486.00	19,651.69	20,142.98	21,013.02	PSA
Chicken (MT)	10,302.00	11,646.56	11,937.72	11,467.69	PSA
Chicken Eggs (MT)	5,401.00	7,085.66	7,262.81	8,476.59	PSA
Duck (MT)	321.00	381.50	391.04	403.72	PSA
Duck Eggs (MT)	463.00	537.96	551.41	665.02	PSA

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Indicator	Baseline	Targets		Accomplishment 2021	Reporting Entity
	2016	2021	2022		
Volume of Fisheries Production	482,790.72	578,608.67	600,528.08	377,986.29	PSA
Commercial Fisheries (MT)	35,585.00	37,400.44	37,774.45	30,340.23	PSA
Municipal Fisheries (MT)	131,183.00	137,875.09	139,253.84	120,893.37	PSA
Aquaculture (MT)	316,022.00	403,333.13	432,499.78	226,752.69	PSA
Tilapia	1,076.96	1,520.86	1,558.88	222.13	PSA
Bangus	2,514.45	1,553.96	1,592.81	1,758.24	PSA
Seaweed	312,922.64	371,103.80	380,381.39	224,318.38	PSA
Tiger Prawns	341.36	293.11	300.44	255.59	PSA
White Shrimp	122.91	83.25	85.34	0.95	PSA
Other				197.40	PSA
Annual agri and fishery production loss due to weather and climate-related disasters reduced on the average (PhP)	312,032,283	367,790,165	331,011,149	1,796,911,599.39	PSA
Growth in Labor Productivity of Farmers and Fisherfolk Increased	-1.29	10-15	10-15	Data not yet available	PSA

Source: Philippine Statistics Authority MIMAROPA and Department of Agriculture MIMAROPA

c. Moving Forward

As a way forward, there is a need to empower MIMAROPA's farmers and fisherfolk as well as the private sector to increase agricultural productivity and profitability, taking into account sustainability and resilience. This can be done through the use of relevant and innovative technologies, provision of affordable credit, value-adding, developing markets at the local and national levels, organization of farmers and fisherfolks, and sustained empowerment and skills development of farmers and fisherfolk.

With the onset of COVID-19 and the *new normal*, there will be a continuous demand for modern agricultural machinery and equipment in place of manual labor, given the need to limit the movement of people. Innovative technologies on processing and packaging need to keep up with the increased demand for processed food with longer shelf life. This also means that there will be a higher demand for raw materials used for preserving food such as salt, sugar, and vinegar. These innovative coping mechanisms, which have rapidly sprung up, are proving to be a lifeline for farmers allowing them to take advantage of the recent increased demand for locally sourced goods.

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For MIMAROPA's AFF Sector to transition to the new normal and ways forward, the following strategies shall be implemented in the region:

1. ***Support the implementation of Republic Act (RA) 11524 or the Coconut Farmers and Industry Development Plan (CFIDP)*** - The CFIDP includes a national program for: a) community-based enterprises; b) social protection; c) coconut farmers organization and development; d) innovative research projects and their practical application; and e) integrated processing of coconut and downstream products.

The Coconut Farmers and Industry Trust Fund, created under Section 7 of RA 11524, shall be utilized and maintained for 50 years under the CFIDP and shall be used for the benefit of the coconut farmers, including indigenous communities in the region, and in the development of the coconut industry. Immediately upon enactment of RA 11524, the Bureau of Treasury (BTr) shall transfer Php10 billion to the trust fund.

The CFIDP contributes to the accomplishment of the goals of AmBisyon Natin 2040 of achieving a Matatag, Maginhawa at Panatag na Buhay. It would also serve as intervention in achieving the goals stated in the 0-10 point Socioeconomic agenda of the current Administration and the updated MIMAROPA RDP 2017-2022. Currently, the CFIDP is awaiting signature of President Rodrigo R. Duterte.

2. ***Support the implementation of the Philippine Fisheries and Coastal Resiliency (FishCoRe)*** – The project aims to increase fisherfolk households' income through improved management of coastal fishery resources and strengthened fishery value chain in Fishery Management Area (FMA) 6 with the municipalities of Lubang and Looc in Occidental Mindoro as parts of the FMA and strengthen the resilience of vulnerable coastal communities and fishery resources.

The total FishCoRe Project cost is estimated at Php11 billion of which Php9.6 billion shall be funded by the World Bank through a loan; Php610 million shall be funded by BFAR; Php996 million shall be funded by the private sector; and Php208 million shall be funded by beneficiary groups and cooperatives. A total of Php427.07 million will be allocated to implement the FishCoRe project in the MIMAROPA region. RDC MIMAROPA issued the endorsement of the project to the NEDA Investment Coordinating Committee for approval.

3. ***Continue implementation of measures to control impact of the African swine fever (ASF) in MIMAROPA*** - the disease has already spread to 12 regions, 40 provinces, 466 cities and municipalities, and 2,425 barangays. Over 3 million heads of pig have been lost due to the disease, causing a contraction in pork supply and an unprecedented increase in the price of basic agricultural commodities. Only the regions of ARMM, Western Visayas, Central Visayas, Zamboanga Peninsula, and MIMAROPA are

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considered free zones with no recorded cases. These regions can freely trade their products anywhere in the country.

To assist hog raisers in sustaining and increasing pork production, the DA through its Agricultural Credit Policy Council (ACPC) has allotted an additional Php300 million for lending to backyard and semi-commercial raisers in "green zones" or areas free from the ASF.

To address the supply shortage, hog raisers shall be assisted in repopulating swine. The Landbank of the Philippines earmarked Php15 billion for the implementation of the Special Window and Interim Support to Nurture Hog Enterprises (SWINE) Lending Program.

4. ***Continue management of the Highly Pathogenic Avian Influenza (HPAI) H5N1 (Bird Flu)*** - To contain the spread of the Bird Flu with cases reported in Bulacan and Pampanga, the DA ordered a 30-day temporary suspension on the movement of all species of live birds-poultry and non-poultry from the Mainland Luzon to MIMAROPA, Visayas, and Mindanao. Consumers in MIMAROPA may face spikes in prices of table eggs and chicken meat with the imposition of inter-island movement restrictions on poultry products due to bird flu concerns.
5. Development of programs that will modernize agriculture and promote diversification are important components toward an enterprise-based rural economy in MIMAROPA. Part of the modernization process is farm diversification or a more balanced agricultural production that is not necessarily focused on rice, corn, and coconut but shall include those products with export potential in processed or value-added forms such as coffee, cacao, cassava, tropical fruits, and rubber, among others.
6. Agriculture and Food Supply Resiliency Strategy aims to facilitate the movement of AFF goods and services through efficient transport and logistics systems. This shall involve the provision of sufficient roads and transport infrastructures and facilities located strategically such as wholesale food terminals and trading centers, warehouses, cold storage and refrigeration facilities, mobile storage, mobile marketplaces, rolling stores, and food banks. Crafting a plan and developing strategies that would ensure a steady supply of these goods are recommended.
7. Research, development, and extension activities shall be intensified. The government shall intensify financial support for public research institutions and state universities and colleges (SUCs) on research and development programs for commercialization of safe, nutritious, medicinal or therapeutic, and well-packaged agri-food products. Partnerships and joint projects by AFF agencies should be explored for the development of agri-food processed products with improved nutritional content and longer shelf-life.

8. Encourage Go Lokal. Buying locally produced goods and services will benefit the MIMAROPA economy. There is a need to promote the local products and improve packaging to make the products more attractive to consumers. Establishing online transactions and trade fairs among MSMEs should be encouraged. Agricultural commodity production needs to adopt urban agriculture, backyard or household gardening of edibles, and community farming. Vacant urban spaces could be utilized for gardening and farming. Households shall be encouraged to establish backyard ‘edible’ gardens while community farming shall be promoted especially in schools with pupils returning to the face-to-face mode of teaching.

d. Recommendations

Apart from ensuring the implementation of the strategies identified in the PDP 2017-2022 Midterm Update and MIMAROPA RDP 2017-2022 Midterm Update, the following identified strategies and interventions need to be implemented:

Challenges	Recommended Strategies	Implementing Agencies
Low productivity	Increase budget allocation for PAPs gearing towards modernization of the AFF sector.	DA, BFAR
	Adoption of Agroecology	
Lack of market outlets	Training on post-harvest processing	DA, BFAR
	Promotion of local produce to the local markets in the region	
Weak resilience to risks especially those from natural disasters brought about by climate change phenomena	Development/establishment of disaster-resilient agriculture related facilities (e.g. irrigation infrastructure facilities and cold storage) that can withstand extreme temperatures and off-season typhoons.	NIA/DA, BFAR
	Adoption of disaster-resilient farming technologies and practices and development or updating of cropping models in the region, which can guide farmers especially during the onset of El Niño or La Niña	DA/DOST/BSWM

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Challenges	Recommended Strategies	Implementing Agencies
	Provision of crop insurance to farmers	PCIC

Chapter 09

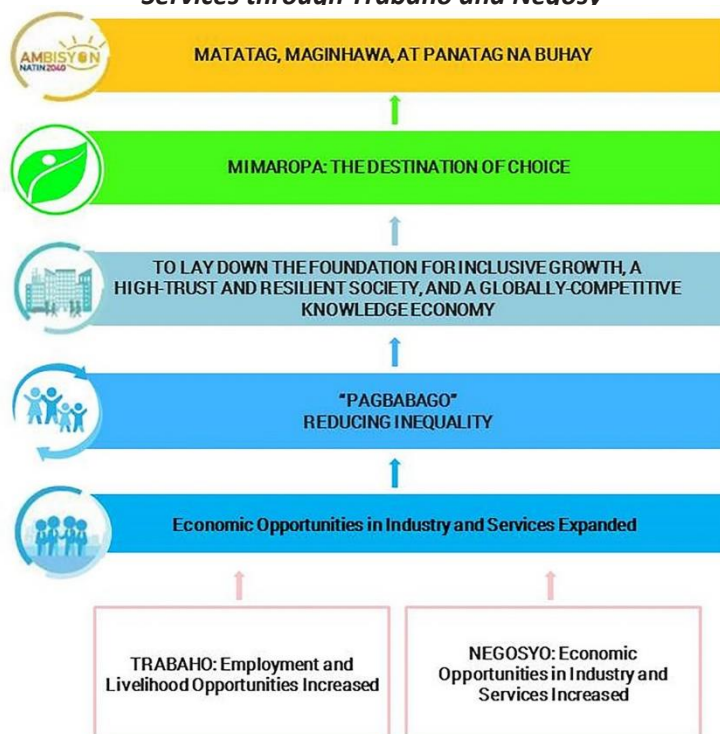
Expanding Economic Opportunities in Industry and Services through Trabaho and Negosyo

Expanding economic opportunities and increasing their share in the gross regional domestic product can be achieved through increased investments, employment and livelihood opportunities, improved access to markets, and increased competitiveness and innovativeness.

This chapter discusses the performance of the industry and services sectors in achieving the desired outcome of reducing inequality through: trabaho or expanding economic opportunities in the sector and Negosyo or increasing access to economic opportunities for MSMEs and cooperatives.

In 2021, industry and services experienced dismal economic growth as effect of the COVID-19 pandemic but Filipinos are born resilient thus they managed to become innovative thus some subsectors managed to increase at a slower pace with the reopening of the region to economic activities.

Figure 9.1 Strategic Framework for Expanding Economic Opportunities in Industry and Services through Trabaho and Negosyo



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Accomplishments

Industry

Table 9.1 Targets and Accomplishments on Industry, MIMAROPA, 2020, 2021 and 2022

Indicator	Baseline Data (2016)	Annual Plan Targets		Accomplishment Report	Reporting Entity
		2021	2022	2021	
Gross Regional Domestic Expenditure	2.6				PSA MIMAROPA
GVA in Industry increased (in %)	2% (actual)	4.5% (low) 5.5% (high)	5.0% (low) 6.0% (high)	data not yet available	PSA MIMAROPA
Manufacturing GVA as proportion of GRDP Increased	5.17%			data not yet available	PSA MIMAROPA
Employment Generated by the industry increased ('000) (10% increase annually)		10,577	11,635	19,130	DTI/DOLE/PSA MIMAROPA
Manufacturing value added as a proportion of GDP and per capita increased		No set target	No set target	data not yet available	PSA MIMAROPA
Manufacturing employment as a proportion of total employment increased (%) (annual increase)		18%	19%	data not yet available	DOLE/PSA MIMAROPA
Total approved investments increased (PHP millions)				1,869.90	PSA
Number of Business Related establishments or Number of Business Name Registered (increasing annually)	12,895	24,724	27,196	20,376	DTI MIMAROPA
Number of Micro, Small, and Medium Enterprises assisted (by DTI)	4,717	11,025	11,576	14,120	DTI MIMAROPA
Jobs/Employment to MSMEs ratio (per MSME)	5	8	8	2	DTI MIMAROPA
Sales to MSMEs ratio (in peso per MSME)	78,000.00	898,322.00	907,306.00	312,989.67	DTI MIMAROPA

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Indicator	Baseline Data (2016)	Annual Plan Targets		Accomplishment Report	Reporting Entity
		2021	2022	2021	
No. of LGUs with automated business transaction processes (e-BPLS, RPTACS)	28	45	50		DTI MIMAROPA
Number of shared service facilities established and maintained	27	45	50	67	DTI MIMAROPA
Number of shared service facilities beneficiaries	2,866	3,630	3,993	751	DTI MIMAROPA
Number of established and maintained Negosyo Centers	32	63	63	60	DTI MIMAROPA
Volume of exports	1,308,509,683.25	6,921,452,912.79	8,305,743,495.34	4,829,335,223.16	PSA MIMAROPA
Volume of imports	601,284,514.09	450,715,199.58	405,643,679.62	792,373,687.11	PSA MIMAROPA

Source: PSA MIMAROPA, DTI MIMAROPA

GVA Growth Rate. The GVA growth rate for the industry sector suffered a reversal of growth recorded at _____ percent. The decrease can be attributed to decreased activities in manufacturing and construction due to COVID-19 pandemic.

In 2020, the pandemic had a huge impact in the industry and services sectors as it temporarily suspended production activities for both goods and services. The imposition of lockdown resulted to the temporary closure of many establishments and a huge number of displaced workers. The workers from the manufacturing, hotel accommodations, restaurants, and other tourism-related businesses are the most affected by the pandemic. The economic opportunities in the industry and services contracted due to decrease in investments, limited mobility and face-to-face transactions, among others

Total approved investments declined. The total approved Foreign and Filipino investments in the region declined by 55.58% in 2021, from 4.21 billion pesos in 2020 to 1.87 billion pesos in 2021 with the region contributing 0.25% of the country's total investments. Because of the COVID-19 pandemic, the flow of investments in the region became very unpredictable. A total of Php 1.67 billion or 88.97% of foreign investment pledges were recorded during the first quarter of 2021 but no investment was recorded during the second and third quarters of 2021. In the last three months where there was ease in mobility and increased

economic activity, foreign investments recorded Php 206.2 million or 11.03% of the region's total approved foreign investments.

Business Name (BN) Registration slightly decreased. The BN registration in the region increased by 39.47 percent from 14,610 BN registered in 2020 to 20,376 BN registered in 2021. This was lower than the 2021 RDP target of 24,724 BN registered. The province of Palawan recorded the highest number of business registered comprising 32.42 percent of the region's total BN registration. All the provinces in the region increased BN registration except the province of Oriental Mindoro that recorded a decrease at 44 percent.

Table 9.2 Business Name Registration, MIMAROPA, 2020-2021

Region/ Province	2020	2021	Percent Change
MIMAROPA	14,610	20,376	39%
Marinduque	1,697	2,356	39%
Occidental Mindoro	1,789	4,122	130%
Oriental Mindoro	3,021	1,685	(44%)
Palawan	6,176	6,605	7%
Romblon	1,927	5,608	191%

Source: DTI MIMAROPA

MSMEs assisted recorded a slight increase. The total number of micro, small, and medium enterprises (MSMEs) that were assisted in the region continuously increased from 14,071 MSMEs in 2020 to 14,120 MSMEs in 2021, exceeding the 2021 RDP target. The assisted MSMEs comprised of 7,520 registered new MSMEs, 1,738 unregistered new MSMEs, and 4,862 registered existing MSMEs with business permit. Assistance includes trainings, seminars and other interventions related to MSME and industry development lodged under various programs such as Negosyo Centers, CARP, One Town One Product Next Generation, Shared Service Facilities Projects, P3 Loan Application, Industry Cluster Enhancement Program and Consumerism.

All provinces recorded an increase in the number of MSMEs assisted in 2021 with Oriental Mindoro having the highest percentage increase at 23 percent. The provinces of Palawan recorded the highest number of MSMEs assisted with 3,906 despite a recorded 24 percent decrease from last year's number of MSMEs-assisted.

Table 9.3 Number of MSMEs Assisted, MIMAROPA, 2020-2021

Region/ Province	2020	2021	Percent Change
MIMAROPA	14,071	14,120	0%
Marinduque	1,789	1,896	6%
Occidental Mindoro	2,067	2,282	10%
Oriental Mindoro	3,123	3,848	23%
Palawan	5,172	3,906	(24%)

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Romblon	1,920	2,188	14%
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Source: Department of Trade and Industry (DTI) MIMAROPA

Marketing activities were also conducted to help MSMEs generate sales amidst the challenges of product marketing during the pandemic. Among the assistance provided were consultancy/business counselling, advocacy, enforcement of FTL laws, trainings/seminars, distribution of livelihood kits through LSP-NSB, provision of packaging and labelling under OTOP, financing for a/clients loan servicing, product development and assistance to e-Commerce. Other project development activities through CARP and NC skills trainings, consultations and designing resulted to 97 improved packaging and label designs. As of December 2021, the region was able to contribute 216 prototypes in the national accomplishment.

There were five trade fairs conducted and 11 trade fairs participated which generated sales amounting to 12.53 million pesos.

MSMEs doing e-commerce increased; jobs and sales to MSME ratio failed to meet RDP targets. Micro, small, and medium enterprises (MSMEs) were forced to rely on the use of ICT and digital services in operating their businesses amid COVID-19 pandemic. In 2021, a total of 5,398 MSMEs utilized e-commerce and online payment in their selling and retailing activities. On the other hand, the job to MSMEs ratio contracted to two jobs generated per MSME while the average sales generated per MSME was recorded at Php 312,989.67 per MSME. These were below the RDP targets for 2021.

LGUs adopted new automated business transaction processes. In 2021, improvements of the business permits and licensing system to Integrated Business Permits and Licensing System (iBPLS) enabled LGUs and their constituents to apply and process building permits and occupancy permits electronically. The iBPLS is a software developed by the Department of Information and Communications Technology (DICT) that allows for the electronic processing of business permits which is being covered by the previous Electronic Business Permits and Licensing System or eBPLS of DICT. Currently, 28 LGUs have operational iBPLS. This was lower than the 35 LGUs with operational e-BPLS and the RDP target of 45 LGUs. On the other hand, all 73 LGUs in the region have their own Business One Stop Shop (BOSS). The establishment of BOSS for business licensing improved the efficient delivery of business and licensing services of the LGUs.

Established and Maintained Negosyo Centers (NC) almost meet RDP target, Negosyo Centers (NCs) provide MSMEs with assistance/ services to ensure sustainability and continuity of their operations. In 2021, there were 60 established and maintained NCs in the region wherein 24 percent came from the province of Oriental Mindoro. These 60 NCs recorded in 2021 are below the 2021 RDP target.

The number of shared service facilities (SSFs) established and maintained exceeded the RDP target. In 2021, a total of 67 SSFs including the Business Resource Centers (BRCs) were established and maintained, exceeding the RDP target by 49 percent. Numerous forms of assistance were provided to 751 SSF beneficiaries. 56 SSFs are operational, nine projects were transferred to cooperators and two projects from the province of Romblon were disposed.

Volume of exports and imports in the region increased. The region's total export volume went up by 9.69 percent from Php 4.40 billion in 2020 to Php 4.83 billion in 2021. On the other hand, the total volume of imports in 2021 amounting to Php 792.38 million increased by 27.67 percent compared to 2020's volume of Php 620.62 million.

The production of minerals in the region slightly improved in 2021. The total volume and value of minerals produced increased by 5 percent and 19 percent, respectively, compared to the 2020 production.

The nickel direct shipping ore production increased by 21 percent compared to 2020 which caused an increase in production value of 32 percent. Despite the overall global market uncertainties, mining operations still showed a significant increase in 2021 which can be attributed to the consistent higher price of nickel in the global market caused by the increasing demand for both electric vehicle and stainless-steel industries.

The volume of production of mixed sulfide by Coral Bay Nickel Corporation (CBNC) which contains nickel and cobalt minerals decreased by 5 percent while the value of production increased by 13 percent. The operations were relatively affected by the lower ore tonnage processed in the region, insufficient supply of milk of lime from Graymont Philippines Inc. (GPI) to CBNC, and the scheduled plant preventive maintenance shutdown. On the other hand, the recorded increase in the value of produced mixed sulfide was influenced by the consistent higher prices of nickel and cobalt in the world market.

The recorded volume and value of sand and gravel production decreased in CY 2021. Moreover, the volume and value of limestone production both decreased by 12 percent CY 2021 which can be attributed to the demands of Coral Bay Nickel Corporation and Graymont Philippines, Inc. (GPI). The volume and value of milk of lime produced by the processing plants in the region have varied performances in CY 2021. The volume of production decreased by 7 percent while the value increased by 14 percent. For the volume and value of hydrated lime, both recorded a decrease of 12 percent and 24 percent, respectively. This can be attributed to the decrease in the overall volume of processed limestone during the year.

Services

Table 9.4 Targets and Accomplishments on Services including Tourism. MIMAROPA, 2021

Indicators	Baseline Data (2016)	Annual Plan Targets			Accomplishment 2021	Reporting Entity
		2020	2021	2022		
GVA in Services increased (in %)	7.90%	7.5% (low)	8.0% (low)	8.5% (low)	data not yet available	PSA MIMAROPA
		8.5% (high)	9.0% (high)	9.5% (high)		

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Indicators	Baseline Data (2016)	Annual Plan Targets			Accomplishment 2021	Reporting Entity
		2020	2021	2022		
No. of tourism products/(sites) developed/(enhanced) (and product partners engaged) based on the NTDP product portfolios	12	20	21	22	37	DOT MIMAROPA
Interregional Flights	1	2	2	2	0	DOT MIMAROPA
International Flights	1	1	1	1	0	DOT MIMAROPA
No. of sustainable destinations developed	2	1	1	1	4	DOT MIMAROPA
No. of road projects endorsed to the DOT-DPWH Convergence	0	25	25	25	0	DOT MIMAROPA
No. of softscapes built through DOT-TIEZA	2	2	2	2	0	DOT MIMAROPA
Percentage increase in tourist arrivals, both in foreign and domestic	10%	10%	10%	10%	(85%)	DOT MIMAROPA
No. of provinces/cities/municipalities with instituted tourism offices	6	2	2	2	0	DOT MIMAROPA
No. of provinces/cities/municipalities with tourism development plans and tourism codes formulated	3	5	5	5	0	DOT MIMAROPA
No. of properties/establishments accredited	397	600	660	726	703	DOT MIMAROPA
No. of capability building programs and activities for LGUs	185	355	400	445	593	DOT MIMAROPA
No. of industry workers trained to enhance skills and knowledge	225	580	600	620	1,550	DOT MIMAROPA

Source: Department of Tourism (DOT) MIMAROPA

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GVA in Services (no data yet)

The number of tourist arrivals recorded a huge decline. Tourist arrivals in the region recorded a 42.02 percent decrease from 299,087 in 2020 to 173,397 in 2021. Consequently, this generated about ₱1.82 billion income for the region's tourism industry which recorded a notable 24.17 percent decrease from last year's recorded tourist receipts of about ₱2.40 billion. It is noteworthy that though lockdown restrictions gradually eased since the start of 2021, the decrease in the performance can be attributed to the tourist arrivals recorded in the first quarter of 2020 when travel restrictions were not yet implemented. However, recorded tourist arrivals continued to improve from the second quarter up to the fourth quarter of 2021 compared to the same period in 2020.

Number of accredited establishments in the region exceeded RDP targets. The number of accredited tourism establishments increased by 28.28 percent from 515 in 2020 to 703 in 2021. This was higher than the RDP target for 2021 of 660 accredited tourism establishments. Information related to these DOT-accredited tourism enterprises can be accessed through the QR (quick response) code. Moreover, there were four sustainable destinations or accommodation with green initiatives developed in Palawan i.e. Puerto Pension in Puerto Princesa City and Pangulasian, Lagen, and Miniloc Island Resorts in El Nido. This was higher than the RDP target of one destination or accommodation.

A web application called Tourism Live Inventory and Statistics of Tourist Arrivals or the TourLISTA was developed by the Department of Science and Technology (DOST). It allows the accommodation establishments to encode their tourist arrivals in the system where the data can be easily accessed by DOT and LGUs.

In 2021, there were 37 tourism products/(sites) developed/(enhanced) (and product partners engaged) based on the NTDP product portfolios, higher than the RDP target of 21. On the other hand, no softscape was built through DOT-TIEZA initiative since the agency fund was realigned to support the government response to address COVID-19. Moreover, no operational interregional and international flights were recorded in the region in 2021.

Road projects endorsed under the DOT-DPWH convergence program decreased. Tourism Road Infrastructure Program of the DOT and DPWH aims to improve access and connectivity to tourism gateways, service centers and tourism sites. The DPWH and the DOT have embarked on a convergence program where they worked together in prioritizing tourism road infrastructure. In 2021, there were no new road projects endorsed under the said program as the two (2) road projects endorsed last year are on-going as of this date.

Provision of skills training program for industry workers pursued. In 2021, a total of 593 tourism industry trainings conducted recorded a 52.84 percent from 388 conducted last year which also increased the capability and skills of 1550 tourism industry workers which is 158 percent higher than the RDP target for 2021. The skills training provided include: homestay training program, child safe tourism

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training, community guiding seminar, and occupational basic life support for tourism frontliners, among others.

Tourism appreciation and recognition conducted. The Department of Tourism MIMAROPA recently awarded outstanding individuals, public and private stakeholders, who provided valuable support to the national efforts to contain the COVID-19 pandemic despite its impact on the tourism industry. Themed “Fame: Soar High and Radiate during a Pandemic”, the MIMAROPA Tourism Appreciation and Recognition Day honored salutes the individuals who are working in the tourism industry who have exemplified our Filipino brand of service during the COVID-19 pandemic. This shows that the region’s frontliners can be inspiring models of how to bounce back in times of crisis and show great dedication to their work in tourism.

Twenty-two tourism stakeholders and five local governments in MIMAROPA were recently honored by the Department of Tourism (DOT) for maintaining high-quality standards by promoting and advocating tourism even amidst the COVID-19 pandemic. The top 5 destinations having the highest number of DOT-accredited tourism enterprises are Puerto Princesa City (1st), El Nido (2nd), Coron (3rd), Puerto Galera (4th), Calapan City (5th).

Moving Forward

As the COVID-19 pandemic wreaked havoc across the globe, it made industry and services sectors dejected as it temporarily deferred production activities for both goods and services, temporary closure of many establishments, and a huge number of displaced workers. The economic opportunities in the industry and services contracted due to decrease in investments, decreased employment and livelihood, among others. The following are the identified interventions and strategies to help the sector bounce back under the “new normal” while both the national and local governments are finalizing their devolution transition plans:

1. Create an investment-climate environment to attract more investments in the region in time with the gradual reopening of the economy. The current business transaction processes shall provide a conducive environment to establish and sustain businesses by simplifying the requirements, providing more incentives, and ensuring that support mechanism such as low interest loan financing are available for investors.
2. Support MSMEs in the growth and evolution of technology, platforms and economy as more consumers purchase goods and services online. It is timely to level up the MSMEs’ game in the e-Commerce and adopt digital solutions and online transactions to increase financial inclusion, improve operations, and expand access to market. It is also important to improve the region’s logistical landscape by tapping into the region’s export potential.
3. Encourage tourism establishments to adhere to the World Travel and Tourism Council (WTTC) Safe Travels Stamp. The WTTC Safe Travels Stamp is the world’s first safety and hygiene stamp for travelers to

recognize governments and businesses that have adopted global health standardized protocols.

4. Enhance tourism and industry policy and planning activities through formulation of local tourism development plans, tourism rapid assessment, local tourism and investment codes that are necessary to provide direction and prioritization of interventions. LGUs should also be able to harmonize their plans, incentives, and investment codes with the national priority plan.

Recommendations

The following are the recommended strategies based on the challenges faced by the sector:

Chapter Outcome/ Cross sectoral concerns	Challenges	Recommended Strategies	Implementing Agencies
Economic Opportunities in Industry and Services Expanded	Improving access to economic opportunities in Industry & Services for MSMEs,	<ul style="list-style-type: none"> • Create an investment-climate environment to attract more investments • Provide enabling environment for MSMEs to recover from their losses through accessible and low interest loan financing schemes • Improve the region's logistic landscape through robust logistics network that will bridge the gap of the region's unique archipelagic set-up • Support MSMEs in the growth and evolution of technology, platforms and economy as more consumers purchase goods and services online 	DTI, DOTr, DPWH, DICT, LGUs
	Ensuring tourism resiliency in reopening prime tourist destinations	<ul style="list-style-type: none"> • Intensify call to adhere to the World Travel and Tourism Council (WTTC) Safe Travels Stamp to all DOT-accredited accommodation establishments (AEs) and tourism destinations that are open to local tourists • Formulate tourism policy and planning which includes local tourism development plans, tourism rapid assessment, local incentives and local tourism and investment codes that are necessary to provide direction and prioritization of interventions. 	DOT, LGUs

Chapter 14

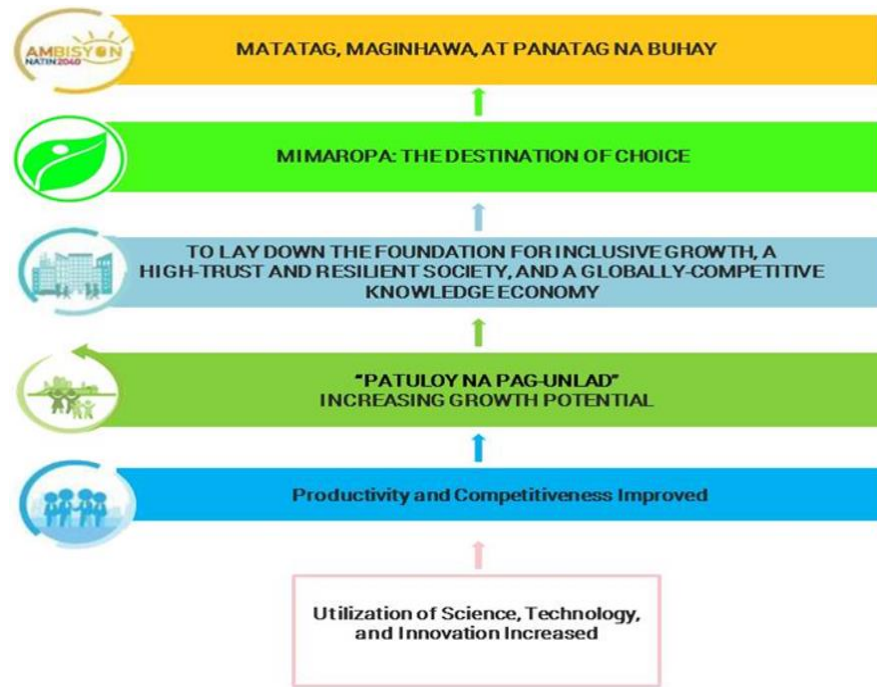
Vigorously Advancing Science, Technology, and Innovation

a. Abstract

The promotion of science, technology, and innovation (STI) is essential to long term socio-economic development and is part of the priority agenda of the current administration. STI are key factors to address the new and recurring challenges of the region such as product development and value adding, improve delivery of social services, improve resiliency, and increase livelihood opportunities and employment. Harnessing STI will improve the productivity, efficiency, competitiveness, and innovative capacity of the region.

This chapter assesses the activities and interventions relative to STI versus the targets set in the updated MIMAROPA RDP 2017-2022 gearing towards the outcome of an increase in utilization of science and technology in the region.

Figure __ Framework for Vigorously Advancing Science, Technology, and Innovation



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b. Accomplishments

The STI sector showed varied performances in terms of achieving some of the targets set in the updated MIMAROPA RDP 2017-2022 Midterm Update (Table __). The sector continues to struggle in generating updated regional or disaggregated data on number of R&D proposals of applied and basic researches funded, percent increase in R&D funds received, proportion of (regional) intellectual property expenditure to GRDP increased, and number of technologies developed as output of R&D. The lack of such data hinders better assessment in terms of tracking the STI's progress and performance in the region.

Table __: Chapter 14 Results Matrix

Indicator*	Region/ Province	Baseline	Annual Plan Target		Accomplish ment**	Reporting Entity
		Value (2018)	2021	2022	2021 or Q1-Q3 2021	
Enhanced adoption of local research and development outputs to improve productivity and competitiveness						
Number of Technology adoptors/ start-ups assisted under SETUP	MIMAROPA	92	98	100	47	DOST
Number of technology interventions under SETUP						
Technology upgrading	MIMAROPA	92	98	100	49	DOST
Consultancy	MIMAROPA	36	25	25	46	
	Marinduque				5	
	Occ. Mindoro				10	
	Or. Mindoro				18	
	Palawan				5	
	Romblon				8	
Laboratory testing	MIMAROPA	651	650	700	1,883	DOST
Training & fora	MIMAROPA	148	76	83	145	DOST
	Marinduque				17	
	Occ. Mindoro				44	
	Or. Mindoro				18	
	Palawan				42	
	Romblon				24	
For SETUP-assisted firms:						
Increase in productivity	MIMAROPA	16.18%	10%	10%	12.21%	DOST
Jobs Generated	MIMAROPA	90	100	100	218	DOST

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Indicator*	Region/ Province	Baseline	Annual Plan Target		Accomplish ment**	Reporting Entity
		Value (2018)	2021	2022	2021 or Q1-Q3 2021	
Creative capacity for knowledge and technology generation, acquisition, and adoptions enhanced						
R&D expenditure as proportion of GRDP increased (in percent, cumulative)	MIMAROPA	0.03 % (2018)	-	-	0.03 % (2018)	DOST R&D survey results (Data available every 3 years)
Gross Regional Research and Development (R and D) expenditure	MIMAROPA	Php 80 million (2018)	-	-	Php 80 million (2018)	DOST R&D survey results (Data available every 3 years)
No. of industrial designs registered in RADIUS	MIMAROPA	1 filed and 1 granted	-	-	2 filed and 2 granted	DOST
No. of R&D proposals on applied and basic researches funded	MIMAROPA	71	-	-	(No data available)	DOST
No. of researchers registered in RADIUS	MIMAROPA	516	-	-	758	DOST
No. of learning and development opportunities provided through R&D consortia	MIMAROPA	17	-	-	38	DOST
No. of technologies developed as output of R&D	MIMAROPA	25	-	-	(No data available)	DOST
No. of	MIMAROPA	19	-			DOST

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Indicator*	Region/ Province	Baseline	Annual Plan Target		Accomplish ment**	Reporting Entity
		Value (2018)	2021	2022	2021 or Q1-Q3 2021	
technologies commercialized/ utilized/ adopted				-	3	
No. of publications registered in RADIUS	MIMAROPA	303	-	-	829	DOST
Number of patent applications registered in RADIUS	MIMAROPA	21 filed; 2 granted	-	-	36 filed	DOST
No. of utility model registered in RADIUS	MIMAROPA	2	-	-	77 filed and 37 granted	DOST

Source: Department of Science and Technology (DOST) MIMAROPA

* Report on either core indicator or intermediate outcomes/outputs depending on availability. Provincial data may be included, if available.

** Latest available data (full year or Q1-Q3 of reporting year)

Most of the technology adoption and other related activities achieved the RDP targets.

In 2021, the Small Enterprise Technology Upgrading Program (SET-UP) served as vehicle in assisting the Micro, Small, and Medium Enterprises (MSMEs) in the region through adopting appropriate technological innovations that will improve or develop their products, services, and operations. For 2021, the following were the number of services provided to the region's MSMEs under the SET-UP: 47 number of technology adoptors/start-ups assisted under SETUP, 49 technologies upgraded, 46 consultancy services, 1,883 laboratory tests and calibration for 243 customers, and 76 trainings and fora (mostly conducted via online).

The SET-UP assisted firms and generated about 218 employment opportunities in the region, surpassing the 2021 RDP targets. Consequently, the productivity rate of these firms were recorded at 12.21 percent. This was significantly higher than the previous year's rate of negative 8.52 percent surpassing the RDP target for 2021 of 10 percent increase in productivity rate.

Creative capacity for knowledge and technology generation, acquisition, and adoptions enhanced. The 2018 Research and Development (R&D) Survey Report was released in May 2021 wherein the share of the R&D

Expenditure to the Gross Regional Domestic Product was recorded at 0.03 percent. The report also showed that a total of 114 R&D full-time equivalent (FTE) employees/personnel were recorded in the region with 54 personnel considered researchers.

The DOST established the Research and Development Information Unified System (RADIUS) to provide database on R&D-related information and materials. Included under the RADIUS are the following 2021 R&D accomplishments of the region:

- Two industrial designs filed and registered each in the region.
- Total number of registered researchers in RADIUS increased by 21.47% from 624 researchers in 2020 to 758 in 2021.
- Thirty eight (38) learning and development opportunities were provided through R&D consortia. This was higher than the 14 recorded learning opportunities in 2020.
- Three technologies were commercialized/utilized/adopted which was lower compared to the 16 technologies recorded in 2020.
- Recorded number of publications registered in RADIUS for 2021 was 829 (cumulative). On the patent applications registered in RADIUS, a total of 36 patents were filed. Moreover, there were 77 utility models filed and 37 granted, as registered in the RADIUS.

c. Moving Forward

Generally, the STI performed better in terms of achieving set targets in the RDP results matrix compared to last year. However, the region has yet to address several challenges including the availability data for various regional indicators. The region should consider the following strategies to achieve the end-of-plan targets:

Strengthen implementation of key laws and policies through improved collaboration among actors in the STI ecosystem and increase investments in STI-based startups and enterprises.

RA No. 11337 or the Innovative Startup Act aims to provide benefits and incentives to startups and enablers in the country. It also pushes for the removal of procedural constraints for businesses by streamlining government and non-government operations. On the other hand, RA No. 11293 or the Philippine Innovation Act provides the guidelines in achieving the innovation goals of the country. The law is expected to provide a better environment for science, technology and innovation through more responsive policies, rules, and regulations. The possibility of creating a Regional Innovation Council will help improve and strengthen the region's innovation program.

In order to strengthen implementation of these laws, DOST, DICT, and DTI along with other agencies related to the STI sector should

continue its collaboration efforts. Agencies should also continue to establish linkages with the academe and industries to have a better idea of the business environment and available opportunities for innovation.

Regular consultation and coordination with technology adopters of commendable R&D products and services should also be conducted regularly. Technology adopters can also be provided with incentives to encourage more clients to adopt these technologies.

Increase public awareness of R&D activities.

As stated in the previous RDP, the concerned government agencies should ensure the availability and reliability of science and technology and R&D data. The establishment and continuous improvement of RADIUS is a welcome development. Access to RADIUS should be promoted to stakeholders through the conduct of information, education, and communication (IEC) campaigns to stakeholders. Access to the data will help improve the policy, planning, monitoring, and other decision-making activities for the sector. The sector should also prioritize studies or topics identified in the R&D agenda of the region. In addition, the best practices, technologies, and R&D results of other countries may also be adopted and disseminated to stakeholders if applicable in the respective fields of the STI stakeholders.

d. Recommendations

The following strategies are recommended to address the challenges and gaps of the existing programs on vigorously advancing STI:

Chapter Outcome/Cross sectoral concerns	Challenges	Recommended Strategies	Implementing Agencies
Strengthen collaboration among actors in the STI ecosystem	The need to harmonize governance framework of the STI sector to include the academe and private sector	Encourage the DOST, DTI, DICT, and other stakeholders to collaborate in implementing the RA No. 11337 or the Innovative Startup Act and RA 11923 or the Philippine Innovation Act	DOST, DTI, DICT, RLAs, LGU, Academe, private sector
		Strengthen academe-industry linkages	DOST, DTI, Academe, PSR

Chapter Outcome/Cross sectoral concerns	Challenges	Recommended Strategies	Implementing Agencies
Increase investments in STI-based start-ups, enterprises, and spin-offs	Low STI investments	Establish and expand STI programs along with accelerated R&D trusts under NICHE Centers in the region for R&D (NICER) and R&D Leadership (RLead) Program	DOST
		Provide operational and monetary support to innovative and tech start-ups	DA, DOST, DTI, DICT
Public awareness on R&D activities	Commercial viability and marketability of R&D outputs of HEIs	Introduce research outputs ready for adoption to SUCs, HEIs, entrepreneurial organizations, and Negosyo Centers	DOST, SUCs, HEIs
		Establishment of innovation hubs in the provinces of Marinduque, Occidental Mindoro, and Romblon	DOST
	Increase public awareness on R&D activities	Conduct more STI IEC campaigns, exhibits, and expositions on developed technologies	DOST, SUCs
		Enhance the features of the MIMAROPA Research and Development Information Unified System (RADIUS) to include a link to and for easy access to researches and ensure updated and concise R&D data	DOST/RRDIC
		Adopt and disseminate other countries' best practice on technologies and applicable R&D outputs	RLAs, Academe

Chapter 20

Ensuring Ecological Integrity, Clean, and Healthy Environment

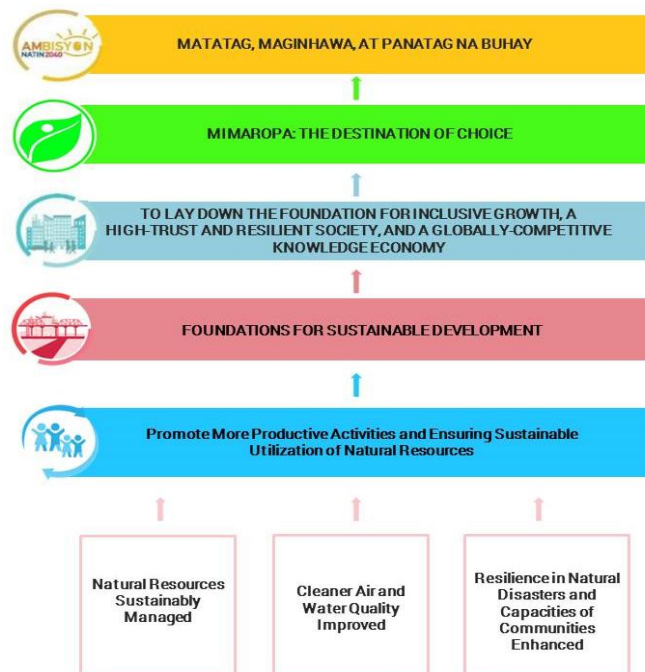
a. Abstract

The continuing challenge brought by the COVID-19 pandemic requires the need for collaboration from all the stakeholders in ensuring ecological integrity and clean and healthy environment for the region. It highlighted the importance of maintaining a healthy ecosystem and ecological balance given the increased demand for single-use items such as gloves and face masks, the increasing waste disposals, and the frequent occurrence of typhoons.

In the region, indicators suggest slight improvement in terms of the quality of land, air, and water, although water quality remains a big challenge especially in tourism destination areas.

With the new normal settings and the global concern on climate change and disaster risks, the efforts on the preservation and protection of the region's environment and natural resources shall be intensified to remain on track.

Figure_ Strategic Framework for Ensuring Integrity, Clean and Healthy Environment.



Highlighted portions in green and yellow are yet to be updated

b. Accomplishments

Sub-Chapter Outcome 1: Natural Resources Sustainably Managed.

a. Forest Resources and Watershed Management

The implementation of enhanced national greening program (eNGP) for 2021 was focused on the comprehensive site development, maintenance and protection of established plantations, maintenance of clonal nursery and production of cloned seedlings, and hiring of forest extension officers (FEOs) for the management and supervision of the NGP areas and activities.

The region's 1.05 hectares clonal nursery in Gloria, Oriental Mindoro was maintained but recorded a very low survival rate due to the unavailability of the required root stimulating hormones which was also triggered by the damages brought by the typhoon. On the other hand, a total of 10,088 different indigenous tree species were produced thru non-mist propagation.

The implementation of the eNGP was challenging due to the imposition of the LGUs' travel restrictions and health protocols. The eNGP was able to produce 1,898,280 NGP seedlings and planted 1,691,431 NGP seedlings with 85 percent survival rate. The region also exceeded the RDP target for the number of NGP area planted and site prepared with 3,937 hectares compared to the 1,550 hectares target. However, the region fell short of the RDP targets in terms of hiring of FEOs with a total of 53 FEOs and NGP staff hired and the number of NGP area maintained and protected at 5,303 hectares. The achievement of the RDP targets of the eNGP was solely dependent on the agency approved budget for the period.

The delineation of boundaries between production and protection forests in the region is being done to address illegal forest activities and support forest developments for potential forest investment opportunities. However, only 74 percent or 370 kilometers of the 500 kilometers forest production and protection areas were delineated in 2021. Among the issues encountered during the delineation activities include: (1) hostile reactions of some tribal group members; (2) extreme weather conditions; and (3) high cost of transportation. On the other hand, no forest cover survey was conducted by NAMRIA in 2021.

The RDC MIMAROPA adopted the MIMAROPA Integrated Water Resources Management (IWRM) Framework Plan through RDC Resolution No. 2021-077-1023: Adopting the MIMAROPA IWRM Framework as an integral part of development planning and programming in the Region. All the planned activities relative to IWRM were expected to commence in 2022. Moreover, the DENR MIMAROPA finalized the Integrated Watershed Management Plan (IWMP) for three critical watersheds namely: (1) Caguray

Watershed in Occidental Mindoro; (2) Bansud River Watershed in Oriental Mindoro; and (3) Catuiran-Bucayao River Watershed in Oriental Mindoro. Moreover, the IWMP of Bongabong Watershed in Oriental Mindoro, which was categorized as a non-critical watershed but supplies water to hundreds of hectares of rice fields in the low-lying areas, was prepared and subjected to review and evaluation of the DENR MIMAROPA. The characterization and vulnerability assessment of two critical watersheds namely Pagbahan River Watershed (Occidental Mindoro) and Aborlan Watershed (Palawan) was also conducted, thus achieving the RDP target for the period.

b. Management of Protected Areas and Coral Reefs

The region achieved its 2021 RDP target in terms of the number of protected areas (PAs) managed with 15 PAs. The region achieved the 2021 RDP targets as it maintained and protected the following coastal marine ecosystems covering 414,733 hectares:

- i. Tubattaha Reef Natural Park
- ii. Apo Reef Natural Park
- iii. Malampaya Sound Protected Landscape and Seascape
- iv. El Nido-Taytay Managed Resource Protected Area

In terms of local Marine Protected Area Network (MPAN), only two (Sablayan-Calintaan MPAN and Verde Island Passage MPAN and Law Enforcement Network) out of the four established MPANs were maintained and protected during the year.

c. Caves Management

In 2021, there were 388 caves recorded in the region. Three caves namely, (1) Ka Amon Cave in Marinduque, (2) Basyong Cave in Oriental Mindoro, (3) Aguada Cave in Romblon were assessed and recommended for classification of the DENR Biodiversity Management Bureau.

A total of twelve caves in the region with approved classification were recorded as of 2021. Out of these caves, management plans for two caves in San Jose, Occidental Mindoro (Virginia and Catburan Caves) were prepared and recommended for approval, thus, achieving the 2021 RDP target. Moreover, the Manturidao Cave's management plan of San Jose, Occidental Mindoro was adopted through a Memorandum of Agreement (MOA) between the DENR and the concerned LGU.

d. Inland Wetlands

No activities relative to inland wetlands management were recorded during the year aside from the inventories and profiling of inland wetlands in the provinces of Marinduque and Romblon and Oriental Mindoro. Table __ shows the inventory of MIMAROPA wetlands as of December 2021.

Table 20.1 Inventory of MIMAROPA wetlands, December 2021

Province	River	Inland Wetland (lake, manmade, etc.)	Coastal
Marinduque	32	1	43
Occidental Mindoro	53	29	616
Oriental Mindoro	35	3	32
Palawan	237	10	1,275
Romblon	70	2	79
Total	427	45	2,045

Source: DENR MIMAROPA

e. Land Distribution

Recorded agricultural and residential free patents issuance in the region fell short of the RDP targets for 2021 with 273 patents and 681 patents, respectively. The issuance of residential or agricultural free patents is pursuant to Republic Act No. 10023, otherwise known as an Act Authorizing the Issuance of Free Patents to Residential Lands.

As of 2021, 35 barangays in the region (15 in Marinduque and 20 in Palawan) have conducted cadastral mapping activities. The cadastral mapping is a necessary input in the Rapid Land Tenure Appraisal (RLTA) which aims to accelerate land titling in the country. On the other hand, the RDP target of two foreshore permits/leases of contract reviewed and endorsed to Land Management Bureau (LMB) was achieved during the year.

f. Wildlife Resources

The RDP target of increasing the number of tamaraw population was not achieved. A total of 427 individuals of tamaraw were recorded in 2021 comprising of 217 adults, 103 juvenile, 80 yearlings, and 27 calves. During the year, the Tamaraw Meta-Population Project was implemented through DENR Foreign Assisted Special Projects Service. The project, amounting to Php 2 million, comprised of two components: (1) Island-wide identification and mapping of the tamaraw locations and habitats; and (2) meta-population monitoring through identification of appropriate count methods suitable to a range of habitat types.

In 2021, there were four species of marine turtles that were observed in the region, namely: green turtle or *Chelonia mydas* (endangered), hawksbill turtle or *Eretmochelys imbricata* (critically endangered), loggerhead turtle or *Caretta caretta* (endangered), and leatherback turtle or *Dermochelys coriacea* (critically endangered). A total of 38 marine turtles (34 Green Sea Turtle, 2 Hawksbill Turtle, 1 Loggerhead Turtle, and 1 Leatherback Turtle) were stranded, rescued, and tagged in the region. However, the recorded

loggerhead and leatherback turtles in the provinces of Marinduque and Occidental Mindoro, respectively, were both dead when found.

The 2021 Asian Water Bird Census was conducted in the provinces of Occidental Mindoro, Oriental Mindoro, and Palawan. Based on the records, there were approximately 64 species of water/migratory birds identified in the region. The total number of water/migratory birds counted was significantly higher by 117 percent from 5,705 birds in 2020 to 12,365 birds in 2021.

Sub-Chapter Outcome 2: Clean Air and Water Quality Improved

a. Air and Water Quality Management

Generally, the ambient air quality in MIMAROPA remained within the National Ambient Air Quality Guidelines Value (NAAQGV) in 2021. Out of the four monitoring stations, three stations located in Oriental Mindoro (Baco and Naujan) and Palawan (Puerto Princesa City) passed the standard level of PM 10 (60ug/Ncm) and 2.5 (25ug/Ncm) as targeted in the RDP. This means that the air quality in the region was satisfactory and air pollution posed little or no risk based on the air quality index. Breakdown of the monitoring equipment in Calapan station was reported resulted to limited information to measure air quality in the area.

In 2021, there were four priority rivers monitored in terms of its biochemical oxygen demand (BOD) levels. Out of these four priority rivers, three fell below the standard criteria of BOD level of less than 7mg/L. These are Calapan River, Madugo River, and Pinamalayan River in Oriental Mindoro. Only the Tagbueros River in Palawan passed the standard BOD level at 3mg/L BOD level. The poor BOD levels of the three rivers were associated with the nature of the river as a catchment basin of wastewater from commercial and residential establishments where the high volume of solid waste, plant materials, and other floating materials in rivers increases the BOD levels. Also, the weather condition (high temperature) during the time of sampling might have increased the metabolic rate of microorganisms in water which degraded stored organic matters into phosphates and nitrates with the aid of oxygen, resulting to decreased oxygen level and higher BOD levels of the river.

In MIMAROPA, a total of four waterbodies officially designated as Water Quality Management Areas (WQMAs) namely: (1) Calapan River in Oriental Mindoro; (2) Coron Bay in Palawan; (3) Sabang Bay in Puerto Galera; and (4) Bacuit-El Nido Bay in Palawan). The Bacuit-El Nido Bay was recently designated WQMA on December 23, 2021 through DENR Administrative Order No. 2021-44. Based on the ambient water quality monitoring results as shown in Table 20.2, three WQMAs (Calapan River and Sabang Bay in Oriental Mindoro and Bacuit Bay in Palawan) failed in

terms of fecal coliform levels while two WQMA (Coron Bay and El Nido Bay in Palawan) passed the standard water quality guidelines in CY 2021 (Table 20.2). The failures can be attributed to establishments and residential wastewater discharges with no adequate wastewater treatment facilities which contributed in the increase of fecal coliform concentrations.

For other waterbodies (Boac and Mogpog Rivers in Marinduque, Pandurucan River in San Jose, Occidental Mindoro, and Tagbuos River in Puerto Princesa City, Palawan) and adopted esteros located outside and within WQMA (Puerto Princesa City Estero in Palawan (outside WQMA), Masipit Creek (within Calapan River WQMA), Timbugan Creek (within Sabang Bay WQMA), and El Nido Estero (within Bacuit-El Nido Bay WQMA)), the monitoring were sustained for the period as targeted in the RDP.

Table 20.2 Summary of Ambient Water Quality Monitoring Results by Station, MIMAROPA, 2021

Monitoring Station	Water Pollutant		Water Body Classification
	Standard Water Quality Guidelines	Fecal Coliform Levels	
Calapan River, Oriental Mindoro	200 MPN/ 100 ml	163,995.47 MPN/100 ml	Class C
Coron Bay, Coron, Palawan	100 MPN/ 100 ml	25.89 MPN/ 100 ml	Class SB
Sabang Bay, Puerto Galera, Oriental Mindoro	100 MPN/ 100 ml	168.77 MPN/ 100 ml	Class SB
Bacuit Bay, El Nido, Palawan	100 MPN/ 100 ml	2,100.06 MPN/ 100 ml	Class SB
El Nido Bay, El Nido, Palawan	100 MPN/ 100 ml	21.48 MPN/ 100 ml	Class SB

Source: EMB MIMAROPA

Also, the region was able to sustain the monitoring of two priority recreational waterbodies as targeted in the RDP namely: (1) Honda Bay in Puerto Princesa City, Palawan; and (2) San Isidro Bay in Puerto Galera, Oriental Mindoro. On the other hand, four other recreational waterbodies were monitored exceeding the three RDP target for 2021 namely: Mangarin Bay in San Jose, Occidental Mindoro, Calapan Bay in Calapan City, Oriental Mindoro, Muelle Bay in Puerto Galera, Oriental Mindoro, and Puerto Princesa City Bay in Palawan.

Moreover, the region exceeded the RDP target number of discharge permits with 293 discharge permits issued in 2021. The increase may be attributed to the intensified information advocacy of EMB on processing of discharge permits and the streamlining and online permitting and monitoring system being implemented.

b. Provision of technical assistance in Ecological Solid Waste Management

The total waste collected in MIMAROPA for CY 2021 was recorded at 31,447.76 tons. Out of the five provinces, Palawan has the highest total waste collected at 27,637.40 tons while Occidental Mindoro recorded the lowest with 460.60 tons. This can be attributed to the greater number of population and commercial establishments operating in Palawan as compared to other provinces in the region. There were 38 out of 78 local government units (LGUs) in MIMAROPA, with approved 10-year solid waste management plans (SWMPs) in 2021. The EMB assisted in the updating of the SWMPs of the remaining 40 LGUs in the region which is expected to be approved by 2022. This exceeded the region's target of 10 LGUs assisted for the period.

Pursuant to the DENR directives on the closure of all open dumpsites by March 2021, a total of 33 open and controlled dumpsites were already closed and subjected to rehabilitation in the region. This was higher than the 2021 RDP target of 10 dumpsites. However, the region fell short of its target in terms of monitoring the implementation of safe closure and rehabilitation plan as only 6 LGUs were monitored during the year.

c. Hazardous Wastes

The generated hazardous wastes in the region during the year was 6,457.71 metric tons. About 84% of these wastes were from Palawan sourced from the industrial/commercial/business establishments, institutions and healthcare facilities. Among the MIMAROPA's five provinces, only Palawan has its registered transporter and treatment and storage facility for hazardous waste. In 2021, about 368 registered hazardous waste generators (RHWGs) were recorded in the region. This was higher than the 30 registered generators targeted in the RDP for 2021. Oriental Mindoro has the highest number of registered generators with 154 while Romblon has the lowest number with 23 RHWGs.

Sub-Chapter Outcome 3: Resilience in natural disasters and capacities of communities enhanced

a. Vulnerability and Risk Assessment

Strengthening the region's adaptive resiliency of its communities and ecosystems is one of the priorities of the region given the vulnerabilities to climate-related hazards. A total of five municipalities in the region were assessed for vulnerability and risk in 2021, lower than the eight municipalities targeted in the RDP. The assessment process undertaken determines the nature and extent of disaster risk posed by analyzing and evaluating the various hazards and vulnerabilities of the communities. On the other hand, a total of 46 LGUs had completed/updated their respective

enhanced DRR/CCA comprehensive land use plans (CLUPs), 64 LGUs completed/updated their comprehensive development plans (CDPs), and 49 LGUs have DENR approved forest land use plans (FLUPs). The adoption of the FLUPs by respective LGUs are through the issuance of Sangguniang Bayan Resolution, DENR approval, and the Memorandum of Agreement (MOA) between the DENR and concerned LGUs. The FLUPs of the municipalities of Puerto Galera and Naujan in Oriental Mindoro, and Cajidiocan, Magdiwang, and San Fernando were also adopted in 2021.

The MIMAROPA's high exposure to natural hazards such as typhoons, rain induced landslides, and flooding, among others, the resiliency has improved over the years. All the five provinces in the region have established Provincial Disaster Risk Reduction Management Offices (PDRRMOs) and all the 78 LGUs in the region (73 municipalities and 5 provinces) have fully functional Disaster Risk Reduction Management Operations Centers. A total of 45 LGUs have 24/7 manned operators while 33 LGUs have on-call manned operators. A total of 75 out of 78 LGUs have already completed/updated their local disaster risk reduction and management plans (LDRRMPs) while 77 LGUs have adopted their local climate change action plans (LCCAPs) based on the monitoring records of DILG MIMAROPA.

To ensure immediate responses during disasters, a total of 146 units of hydromet sensors were installed in 53 municipalities in the region. However, only 28 LGUs have operational early warning systems while some sensors were reportedly damaged. The maintenance, troubleshooting, and calibration of the down stations will be conducted in 2022.

Indicator	Baseline Data (2016)	Annual Plan Target		Accomplishment	Reporting Entity
		2021	2022	2021	
Forest area as proportion of total land area					
NGP Number of seedlings produced	36,270,310	1,984,400	1,143,000	1,898,280	DENR
NGP Number of seedlings planted	32,213,952	-	-	1,691,431	DENR
NGP Survival rate of seedlings equal or above 85%	85%	85%	85%	85%	DENR
NGP area planted and site prepared (ha)	19,935.60	1,150	1,150	3,937	DENR
NGP area maintained and protected (ha)	62,411	46,239	27,945	5,303	DENR
Forest cover increased (in ha) from 2010 forest cover data vis-à-vis 2015	34,937.17	Not measurable. Dependent of NAMRIA’s forest cover survey every 5 years.		No latest data yet from NAMRIA	DENR

Highlighted portions in green and yellow are yet to be updated

Indicator	Baseline Data (2016)	Annual Plan Target		Accomplishment	Reporting Entity
		2021	2022	2021	
Forest cover change (from close to open forest) - 2010 forest cover vis-a-vis 2015 forest cover	3.51%	Not measurable. Dependent of NAMRIA's forest cover survey every 5 years.		No latest data yet from NAMRIA	DENR
Delineation of Production and protection forests (km)		500	500	370	DENR
Hiring of extension officers	151	96	60	53	DENR
No. PAs subjected for the updating of their respective SRPAO database	4	No target	No target	Completed in 2018	DENR
No. of protected areas managed and maintained	15	15	15	15	DENR
Area of marine protected areas with high biodiversity value effectively managed (ha) (This include (Tubbataha Reef Natural Park (TRNP) and Apo Reef Natural Park (ARNP) , Malampaya sound Protected Landscape and Sea Scape and El Nido-Taytay Managed Resource Protected Area)		4 PAs 414,733 has.	4 PAs 414,733 has.	4 PAs 414,733 has.	DENR
Coverage of protected areas (PAs) in relation to marine areas	4 PAs 414,733 has.	4 PAs 414,733 has.	4 PAs 414,733 has.	4 PAs 414,733 has.	DENR
Caves management					
No. of caves assessed	7	No target	No target	3	DENR
No. of caves management plan prepared and recommended for approval	7	2	2	2	DENR
No. of caves classified	2	No target	No target		DENR
No. of caves recommended for classification	7	No target	No target	3	DENR
Inland Wetlands					
No. of Inland wetlands assessed	1	No target	No target	0	DENR

Highlighted portions in green and yellow are yet to be updated

Indicator	Baseline Data (2016)	Annual Plan Target		Accomplishment	Reporting Entity
		2021	2022	2021	
No. of Inland wetlands management plan prepared	1	3	3	0	DENR
Land Distribution					
No. of land patents issued:					
Agricultural	400	340	320	273	DENR
Residential Free Patents	1,930	900	880	681	DENR
Management of Foreshore Area					
Provincial Foreshore Management and Development Plan (PFMDP) Formulation	-	-	-	0	DENR
Provincial Foreshore Management and Development Plan Adoption	-	-	-	0	DENR
No. of draft permits/lease of contracts reviewed and endorsed to LMB	17	2	2	2	DENR
Coral Reef Management and Protection					
Coral reefs assessed and mapped (ha)	729	No target	No target	0	DENR
Coastal and marine ecosystems (CMEs) maintained and protected (ha)		4 CMEs 414,733 has.	4 CMEs 414,733 has.	4 CMEs 414,733 has.	DENR
Mangrove area rehabilitated (ha)		No target	No target	0	DENR
Mangrove area managed and protected (ha)	10,175	Target is inclusive with NGP		0	DENR
Tamaraw population	413	increasing	increasing	decreasing	DENR
Survey of wild duck habitat	1	1	1	0	DENR
Watershed Characterization and Vulnerability Assessment conducted in critical watersheds	-	2	1	2	DENR
Cleaner air and water quality improved					
Maintain/Reduced total suspended particulate (TSP) level in major urban centers (90µg/Ncm.)				Baco, Oriental Mindoro is the only air quality monitoring station using TSP level; Air quality monitoring	EMB

Highlighted portions in green and yellow are yet to be updated

Indicator	Baseline Data (2016)	Annual Plan Target		Accomplishment	Reporting Entity
		2021	2022	2021	
				equipment under repair	
1. Calapan City		Maintain the Standard Particulate Matter (PM): PM10: 60 ug/Ncm; PM2.5: 25 ug/Ncm		Air quality monitoring equipment under repair	EMB
2. Puerto Princesa City				PM10: 23.10; PM2.5: 22.10	EMB
BOD and other water tests of rivers within standard quality criteria		Biochemical Oxygen Demand (BOD) levels within standard criteria:		Ave. Biochemical Oxygen Demand (BOD), mg/L:	EMB
1. Calapan River (Oriental Mindoro)		less than 7 BOD mg/L	less than 7 BOD mg/L	17	EMB
2. Madugo River (Oriental Mindoro)		less than 7 BOD mg/L	less than 7 BOD mg/L	9	EMB
3. Pinamalayan River (Oriental Mindoro)		less than 7 BOD mg/L	less than 7 BOD mg/L	10	EMB
4. Tagburos River (Palawan)		less than 7 BOD mg/L	less than 7 BOD mg/L	3	EMB
Priority Rivers , no.		2	2	2	EMB
Other Waterbodies and Adopted Esteros (Outside WQMA), no.		5	5	5	EMB
Other Waterbodies and Adopted Esteros (Within WQMA), no.		3	3	3	EMB
Priority Recreational Waterbodies, no.		2	2	2	EMB
Other Recreational Waterbodies, no.		3	3	4	EMB
No. of discharge permits issued		165	165	293	EMB
Provision of technical assistance in the implementation of ESWM (No. of LGUs assisted)					
Proper closure & rehabilitation of open and controlled dumpsites (no)		10	10	33	EMB
10 year SWM plans assisted (no.)		10	5	40	EMB
Other Sectors Assisted					
Public markets oriented/monitored (no.)		No target	No target	N/A	EMB
Commercial establishment assisted and monitored (no.)		No target	No target	N/A	EMB
Closure and rehab plan implementation (no)		15	15	6	EMB

Highlighted portions in green and yellow are yet to be updated

Indicator	Baseline Data (2016)	Annual Plan Target		Accomplishment	Reporting Entity
		2021	2022	2021	
Establishment of MRFs (with financial grants) 1. MRF with Shredder 2. MRF without shredder		The targets of Regional Offices for this activity are being downloaded by the National Solid Waste Management Commission (NSWMC)		N/A	EMB
Compliant LGUs (no.) SWM plans, SS & SC, MRF,SLF/ environment-friendly disposal/alternative technology/ undergoing closure and rehab of OD and CDF)		5	5	N/A	EMB
No. of registered hazardous waste generators		30	30	368	EMB
Resilience in natural disasters and capacities of communities enhanced					
Vulnerability and Risk Assessment					
No. of municipalities and cities assessed for vulnerability and risk	11	8	6	5	MGB
Number of (reviewed) completed/updated Climate Change (CC)/ Disaster Risk Reduction Management (DRRM)-enhanced plans increased.					
a. FLUP				49	DENR
b. CLUP				46	DHSUD
c. CDP				64	DILG
d. LDRRMP				75	LGUs
e. LCCAP				77	LGUs
Number of LGUs with operating early warning systems (EWS) in place				28	DOST
Number of fully functional DRRM operation centers increased				78	OCD
Groundwater resource assessment					
No. of provinces assessed for groundwater resource	1			Completed in 2018	MGB

Sources: DENR,EMB,MGB MIMAROPA

c. Moving Forward

Achieving a balance between activities for economic recovery and environmental conservation will be quite challenging yet vital for a region that depends on its natural resources as a growth driver. The development, conservation, and protection of the region's natural resources and

Highlighted portions in green and yellow are yet to be updated

biodiversity must be accorded highest priority and shall never be compromised despite the increasing demand to adapt with the new normal setting. The following are the priority interventions to catch up with the regional targets for the remaining one year of plan implementation:

- Ensure the protection and conservation of natural resources. Safety nets shall be developed and put in place to mitigate environmental degradation, over exploitation, and damaging uses of the region's resources. Parallel efforts between the government and private sectors shall be exerted to restore and rehabilitate denuded forest areas, critical habitats, mine sites, over logged areas, and damaged marine areas as well as climate change mitigation and adaptation activities. The region shall also capitalize on the monitoring and coordination mechanism in terms of the implementation of the Philippine Nationally Determined Contribution and Policies and Measures and advocate the cascading of action plans at the regional and local levels.
- Strengthen the capacities of the environmental partners on the ground as reliable watchers/monitors and frontline service providers. The role of Protected Area Management Boards (PAMBs) and Water Quality Management Area (WQMA) Boards in the management and protection of our important environmental areas shall be strengthened. Assessment and review of the goals and objectives of the WQMA and PAMBs shall be done in order to monitor its accomplishments and to identify the gaps and challenges that hinder the achievement of the goals and objectives of the said bodies. Active participation of relevant stakeholders is still necessary and should be institutionalized for stronger interagency board responsible in safeguarding the environmental integrity of the region. Enhanced capacity building should be provided to the members of the PAMB, being the oversight body in ensuring sustainability of protected areas on the ground.
- Mainstream national policies in the local development plans. The national and local government institutions shall strengthen coordinative mechanisms and processes to minimize or reduce overlapping guidelines and activities such as disaster or health outbreak related efforts, mainstreaming of national and development plans, among others. Under Executive Order No. 318, s. 2004, LGUs are mandated to incorporate forest land use plans into their comprehensive land use plans, however there is no existing monitoring mechanism/guidelines on mainstreaming these plans. Existing DRRM and crisis management frameworks must be harmonized through revisions of the implementing rules and regulations of the Philippine DRRM Act 2010 (RA10121) to explicitly

identify public health emergencies such as pandemics in the definition of disaster events.

d. Recommendations

The following supplemental strategies are recommended to address the persisting challenges/gaps towards maintaining ecological integrity and a clean and healthy environment:

CHALLENGES	RECOMMENDED STRATEGIES	IMPLEMENTING AGENCIES
Enforcement of environmental laws Environmental Degradation Strengthen collaboration and efforts to improve environmental quality	<ul style="list-style-type: none"> Assess the PAMBs and WQMA Boards in achieving the goals, objectives, and mandates and identify the gaps, bottlenecks, and possible interventions to improve and strengthen their roles in terms of environmental protection Encourage community-based participatory activities in the implementation of environmental laws; Increase the number of forest rangers, bantay dagat, eco-warriors, PNP/AFP personnel in major areas for environmental conservation to intensify surveillance and enforcement activities in terms of protecting critical wildlife/endangered species and their habitats Upgrade the monitoring equipment and provide additional monitoring stations and laboratory for water and air quality analysis 	DENR, BFAR, PNP, AFP, LGUs
Disaster risk management	<ul style="list-style-type: none"> Strengthen and improve the capacity of disaster risk management offices at the provincial and city/municipal levels through capability trainings and exercises, provision of sufficient emergency response equipment, formulation of DRRM plans and implementation of PAPs particular on the combat against any health outbreaks; Existing DRRM and crisis management frameworks must be harmonized through revisions of the implementing rules and regulations of the Philippine DRRM Act 2010 (RA10121) to explicitly identify public health emergencies such as pandemics in the definition of disaster events 	DENR, EMB, DOH, OCD, PDRRMOs/ CDRRMOs/ MDRRMOs