1 The context of regulation of pesticides in Mexico

This chapter provides an economic and regulatory overview of the pesticide sector in Mexico. The chapter starts by reviewing recent trends on production, sales and international trade of pesticide and agriculture products. The next section outlines the role that a number of agencies have on regulating the Mexican pesticide sector, and it analyses the use of regulatory improvement tools for pesticide policy.

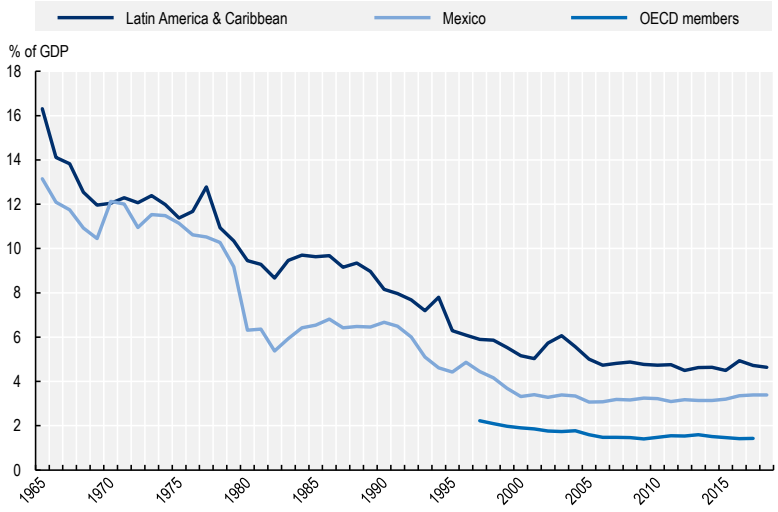
Economic activities related to pesticides in Mexico

Mexican agriculture at a glimpse

The agriculture industry in Mexico has had a small share of GDP for the past two decades

Agriculture's share of GDP declined from 4.4% in 1995 to 3.4% in 2017 (OECD, 2019[1]). The agriculture, forestry and fishery industries represent 3.39% of GDP in Mexico, lower than the Latin-America average at 4.64%, but higher than 1.4% of the OECD member countries (World Bank, n.d.[2]). Agriculture in Mexico, as a percentage of GDP, saw a sharp decrease from the 1960s to the mid-1990s and has been steady since (see Figure 1.1). This was also true of the Latin America & Caribbean (LAC) region. During this period, Mexico had a swift shift to the manufacturing industry. Despite the decreasing share of agriculture GDP, the market volume of the sector has seen a consistent growth for decades. In 2018 the GDP for the agriculture, forestry and fishery sectors in Mexico was valued at USD 41.3 billion[1] up from USD 31.7 billion in 2011.

Figure 1.1. Agriculture share of GDP



Source: Adapted from (World Bank, n.d.[2]).

Over the last two decades, the percent contribution of the agricultural sector to the workforce changed significantly, from 23% of the total workforce in 1995 to 13% in 2017 (OECD, 2019[1]). Still, over 11% of the working population in Mexico (6 million out of 52.9 million) is employed in agricultural activities, which includes small farmers and temporary workers. A further 780 000 work in livestock production and 170 000 in fishing and aquaculture. Mexico ranks 18th in the world in the total employment in these three sectors combined (SIAP, 2018[3]).

The largest agricultural products in Mexico include sugar, corn, and wheat; most of the production comes from medium and small producers.

Recent data on Mexican crops can be found in Table 1.1. In 2018 the main *annual* crops in Mexico were white corn (23 million tonnes) and yellow corn (8 million tonnes). The largest *perennial* crop was sugar cane (56 million tonnes). Regarding the industry structure, the Mexican agriculture market is not fully industrialised; in fact, most of the crops are cultivated by small and medium producers. This is especially the case for white (87%) and yellow (90%) corn, as well as for sugar cane (90%). Given the lack of

economies of scale, the agriculture sector has a relatively low rate of technology adoption and land productivity (see Table 1.2). In all categories including cereals, fruits and vegetables, Mexico has crop yields well below the United States.

Table 1.1. Main crops in Mexico (2018)

All figures in annual tonnes produced

	Annual Production	Large* Producers	Medium and Small Producers		Annual Production	Large* Producers	Medium and Small Producers
Annual crops				Perennial crops			
White corn	23 142 203	13%	87%	Sugar cane	56 354 945	10%	90%
Yellow corn	8 071 840	10%	90%	Orange	2 869 798	10%	90%
Wheat grain	3 214 047	27%	73%	Banana	2 220 400	21%	79%
Tomato	3 008 036	54%	46%	Mango	1 689 839	14%	86%
Chile	1 985 222	33%	67%	Lemon	1 110 840	23%	77%
Bean	1 308 282	8%	92%	Coffee	858 039	2%	98%
Onion	1 051 023	36%	64%	Apple	377 251	19%	81%
Zucchini	740 011	27%	73%	Grape	317 643	57%	43%
Soy	261 248	51%	49%	Strawberry	256 072	38%	62%
Rice	134 524	30%	70%	Cacao	45 377	0.3%	99.7%

* The criterion to divide large producers from small and medium is the threshold of annual sales of one million pesos (~USD 53 000). This definition comes from the 2007 Census and has only been updated in terms of the producers selling more than the threshold (not the threshold or any criteria) (INEGI, n.d.[4]).
Source: Own calculation using data from (INEGI, n.d.[4]).

Table 1.2. Crop Yields 2017

Units: hg/ha

	Cereals	Citrus fruit	Fruit primary	Roots and tubers	Vegetables
Mexico	37 997	142 034	153 007	285 105	220 053
United States	82 808	242 849	228 028	451 105	341 330
North America	74 007	242 849	217 804	316 926	332 432

Source: Adapted from (FAO, n.d.[5]).

Agricultural production in Mexico is scattered throughout the territory

Agriculture, and thus the use of pesticides, is intensive in most of Mexico, except in the north-north-eastern region. Plotting a total of 6 432 484 of land properties, INEGI categorised the amount of cropped hectares of all crops). Information is also available by specific crop. The regions with the most crops are found in Sinaloa (North West), Chihuahua (North West), Tamaulipas (North East), Zacatecas-Durango (Centre), Veracruz (Centre East), and Oaxaca and Chiapas (South).

The proportional land use for agriculture is declining in the majority of the OECD countries, and this rate of decline accelerated from 2002-14; however, Mexico is an exception, together with Chile, Estonia, Finland, Greece, Ireland, Latvia, Luxembourg and the United States (OECD, 2019[6]).

A lack of market information is a central shortcoming for both the pesticide and agriculture industries in Mexico. INEGI has carried out agricultural census (*Censo Agricola, Ganadero y Forestal*) in 1991 and 2007. At the time of the second census, it was expected that such census would be updated every ten years. However, due to a lack of funding, the census has not been updated since. The lack of microdata

is a serious obstacle for an in-depth industry analysis. Most of the data comes from the *Encuesta Nacional Agropecuaria* (ENA), which has been conducted in 2012, 2014 and 2017. This survey has limited representativeness of the Mexican market and less data indicators than the census.

The *Monthly Survey of the Manufacturing Industry* conducted by INEGI has aggregated data on trade volume and prices of pesticides. But, it does not include any further information (categorised by regions, intended use within the agriculture sector, etc.). This survey is only carried out with a limited number of establishments, which makes it difficult to examine the actual size and dynamics of the industry. Most of the foreign trade data comes from the database of the Secretary of Economy, but it's only annually aggregated.

International trade is an important driver of Mexico's economy. It represents 36% of GDP and it grew by 12 percentage points over the last 20 years. Agro-food trade is a key player in terms of total trade, both in terms of exports and imports. Mexico is the third largest agricultural and food exporter in the region (USD 32.5 billion in 2017), after Brazil and Argentina, and is among the major importers of maize, soybeans, dairy, pork and poultry. In 2016, Mexico, after almost four decades of continuous agrofood trade deficits (except during the Mexican crisis of 1985-87), became a net exporter of -agrofood- products (OECD/FAO, 2019[7]).

Organic agriculture

The existing policy framework supports developments in organic production in Mexico. For example, Mexico has a national plan to promote organic production. An integrated organic management strategy for citrus fruits was developed in Mexico in 2011. The Participatory Guarantee Systems (locally focused quality assurance systems, 7 existing and one in development) are recognised under the national legislation in Mexico (Willer and Lernoud, 2019[8]). Mexico has also in place the 2006 Law of Organic Products and implementing regulation.

In 2017, Mexico had one of the largest number of organic producers in the world – 210 000 (after India and Uganda) in 2017 – with over 27 000 certified producers. In the same year it was ranked 13th when it comes to the area of organic production – 673 968 ha which contributed to some 0.6% of the total agriculture land in Mexico. The area of production has experienced a significant growth (about 71% over ten years). Mexico is in the top ten of countries with the largest wild collection and bee keeping areas, with the largest number of organic beehives, and it has the largest area of coffee organic farming (231 000 ha, 36% share of the total area) (Willer and Lernoud, 2019[8]; SIAP, 2018[3]).

The pesticides industry in Mexico

For the past six years the Mexican pesticide industry has had a modest growth, with sales fluctuating considerably from year-to-year

According to the Monthly Survey of the Manufacturing industry, total sales of all pesticides in Mexico amounted to MXN 17 096 million in 2018 (roughly USD 908.5 million) (INEGI, 2019[9]). The average annual growth in the sales of pesticides from 2013 to 2018 was 3.08%, above the average GDP growth. However, the year-to-year growth numbers of the industry have seen considerable fluctuations. As seen in Table 1.3 all pesticide categories, once adjusted for inflation, have had negative growth rates, and large positive jumps. Insecticides account for the largest sales volume, reaching MXN 4 767 million in 2018, followed by fungicides and herbicides.

Table 1.3. Pesticide Sales Value in Mexico

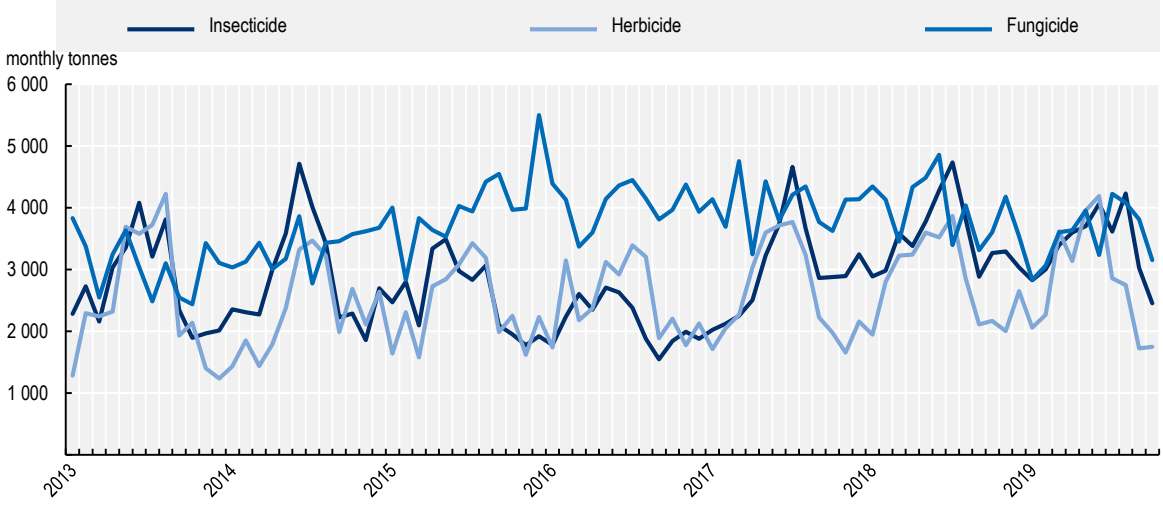
Annual sales in real 2013 MXN million pesos.

	Insecticides		Fungicides		Herbicides	
	Annual sales	y-y growth	Annual Sales	y-y growth	Annual sales	y-y growth
2013	$3 287	-	$2 790	-	$3 705	-
2014	$3 770	14.7%	$2 917	4.6%	$3 380	-8.8%
2015	$3 627	-3.8%	$3 312	13.5%	$4 833	43.0%
2016	$3 737	3.0%	$3 469	4.8%	$4 906	1.5%
2017	$4 719	26.3%	$3 449	-0.6%	$4 644	-5.3%
2018	$4 767	1.0%	$3 554	3.0%	$3 321	-28.5%
2019*	$4 014	-	$2 354	-	$3 028	-

Note: * 2019 figures up to Q3.
Source: Adapted from (INEGI, 2019[9]).

The volume of production follows a similar trend to that of sales value (see Figure 1.2). However, overall, the production of insecticides, herbicides and fungicides, has had a steady trend since 2013. As shown in Figure 1.2, seasonal production tends to vary between 1 500 and 4 000 tonnes per month.

Figure 1.2. Pesticides production in Mexico



Source: Adapted from (INEGI, 2019[9]).

The Mexican pesticide industry has a large market concentration, and pesticide intensity/use is lower than NAFTA partners

Mexico has long-established transnational agribusinesses that, through contract farming, implicitly control the whole production process of several thousand hectares (OECD/FAO, 2019[7]). In 2014, out of 119 companies registered as producing, formulating, assembling, importing or exporting pesticides, only 14 were actually producers, while the majority of the remaining ones were pesticide importers or formulators (Bejarano, 2018[10]). According to figures by the Federal Competition Commission, the four largest companies control 54.3% of the market share, the six largest have 64.2% and the eight largest, 71.8% (COFECE, 2014[11]).

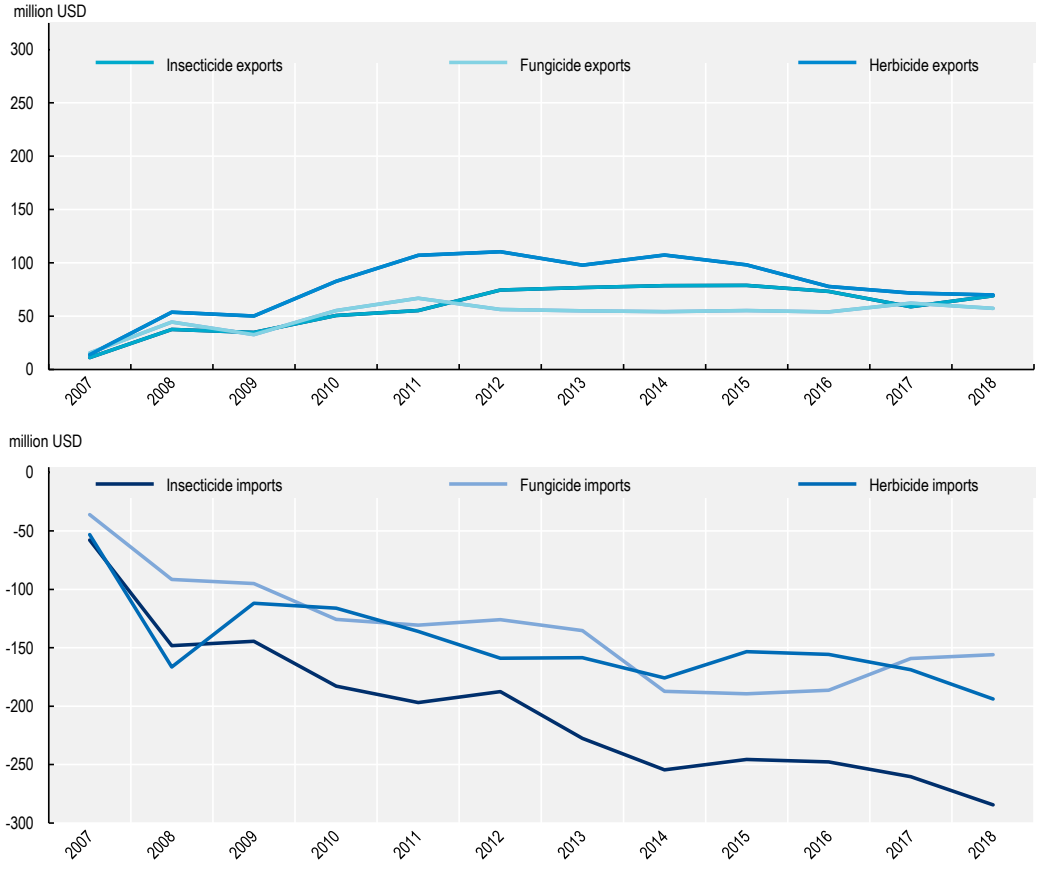
The intensity of pesticide use in Mexico in 2017 was 1.77 kg/ha. Historically, it had been increasing since the early 2000s at 0.63 kg/ha, peaking in 2013 at 2.23 kg/ha. The intensity in Mexico was lower in 2017 than Canada (2.37 kg/ha), the United States (2.54 kg/ha) and South America 5.42 kg/ha. However, Mexico has a higher pesticide intensity than the average in Europe at 1.65 kg/ha (FAO, 2017[12]).

International trade of pesticides

The Mexican pesticide industry relies heavily on international trade, Mexico's trade gap has consistently increased

International trade is a large component of the Mexican pesticide industry. At least since 2007, Mexico has been a net importer of pesticides (see Figure 1.3). The trade gap has consistently increased from USD 107 million in 2007 to USD 438 million in 2018. While imports had an average annual growth of 15.5%, exports grew at 12.4% per year. In 2018, Mexico imported 62.7 million tonnes of pesticide, for an annual value of USD 583 million (Secretaría de Economía, 2019[13]). Herbicides were the largest source of imports in terms of volume (32.4), followed by insecticides (17.6) and fungicides (12.6). In terms of monetary value, insecticides were the largest import market at USD 285 million, then herbicides at USD 194 million and fungicides at USD 156 million. Regarding exports, Mexico sold 37.4 million tonnes, for an annual value of USD196 million. Exports have a more balanced composition both in sales value and in volume.

Figure 1.3. Pesticides International Trade in Mexico



Note: The positive y-axis refers to exports, the negative y-axis refers to imports.
Source: Adapted from (Secretaría de Economía, 2019[13]).

The United States is Mexico's most important pesticide trade partner, however, Mexico has extended its trade partnerships to Europe and Asia

The largest trade partner for all types of pesticides is the United States. The total imports in 2018 from the United States added up to USD 300.3 million (see Table 1.4). The United States is also Mexico's largest export destination, with total annual sales of USD 56.8 million. Besides the United States, the largest export market for Mexico is Latin America, notably Colombia, Guatemala, Peru, Chile and Ecuador. In North America, Canada is also a big export destination for herbicides. Mexico has become an importer of pesticides from Chinese products, as well as European, including Germany, France and Spain (Secretaría de Economía, 2019[13]).

Table 1.4. Main trade partners for pesticides (2018)

All figures in USD

Insecticides			
	Exports		Imports
United States	16 864 045	United States	160 489 280
Colombia	8 451 882	Colombia	22 693 340
Chile	6 002 215	China	14 903 035
Ecuador	5 218 764	Germany	11 450 451
Peru	4 882 516	Indonesia	9 145 546
Fungicides			
	Exports		Imports
United States	22 959 601	United States	47 442 524
Italy	5 695 649	Colombia	25 248 078
Guatemala	3 446 657	France	13 041 303
Colombia	3 117 986	Spain	12 974 050
Australia	1 861 799	Brazil	10 317 764
Herbicides			
	Exports		Imports
United States	16 994 574	United States	92 345 206
Canada	8 455 561	China	31 347 070
Colombia	8 342 742	Israel	11 633 334
Guatemala	6 599 487	Germany	8 948 223
Cuba	5 812 698	India	7 448 933

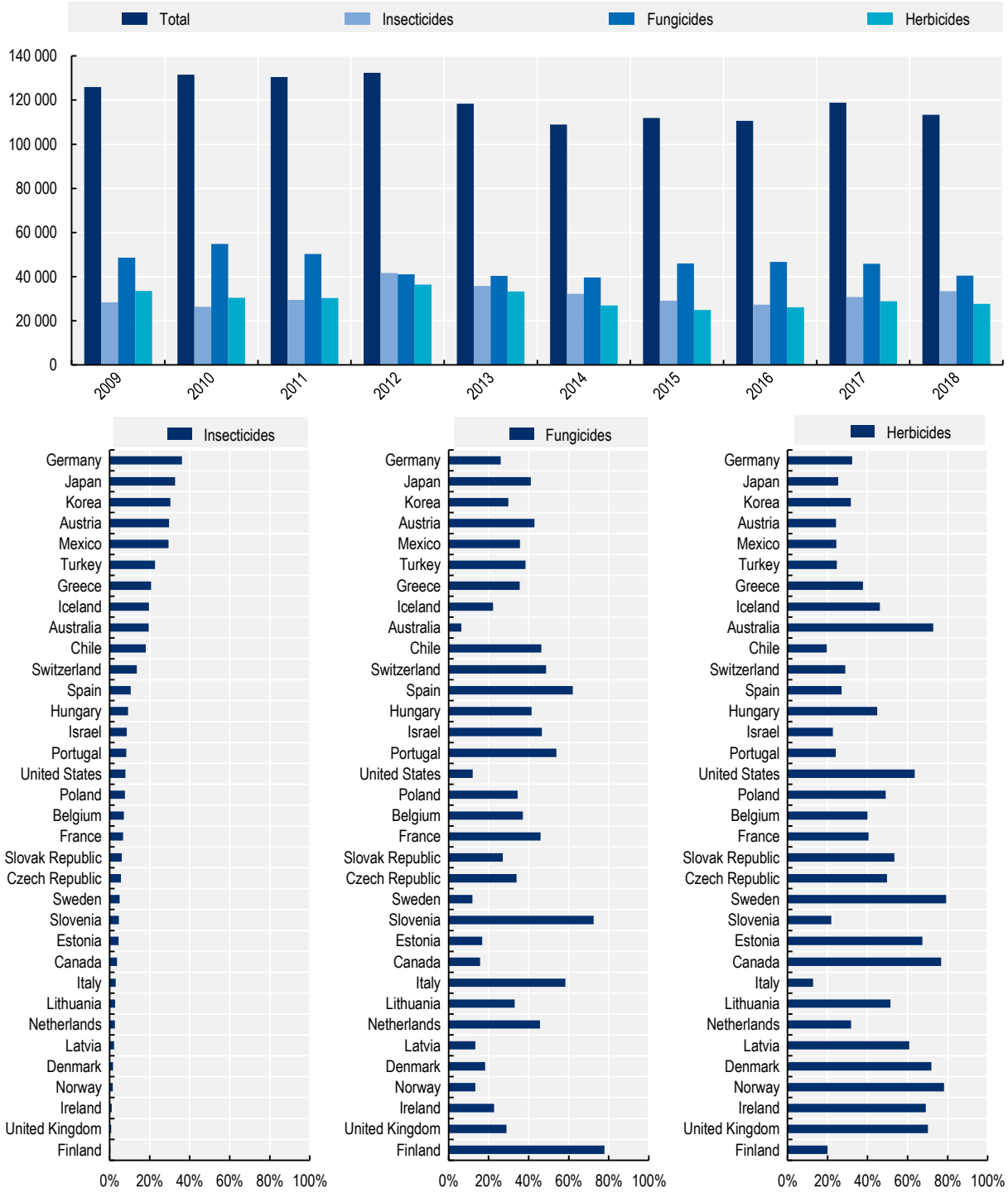
Source: Adapted from (Secretaría de Economía, 2019[13]).

Pressures on health and the environment from pesticides

Excessive pesticide use is a matter of concern in Mexico. High levels of toxic contaminants (e.g. heavy metals, pesticides) have been found in soil, water, and plants and animal species in some specific locations in Mexico, and adverse effects on human health, especially in children, have been identified (OECD, 2013[14]). Pesticides have also led to degradation of ecosystems with noted cases of bioaccumulation in aquatic species. Adverse effects on human health, especially in children, have also been identified. A reduction in use of pesticides to prevent mounting environmental costs is needed (Sud, 2020[15]).

From 2000-2014, the consumption of pesticides in Mexico rose by 59.2% (Bejarano, 2018[10]). Fungicides are the most widely used pesticides, followed by insecticides and herbicides. Figure 1.4 compares the share of types of pesticides sold within Mexico with other OECD countries. Information on the amount and type of pesticides used historically and today in Mexico is limited (INECC, 2019[16]).

Figure 1.4. Fungicides are the most widely used pesticides



Notes: Data in the right panel refers to national sales of pesticides for 2018. Some countries have not updated data in the OECD database, latest data for the following countries: Chile (2013), Israel (2016), Denmark (2017). Some of the data was not available for New Zealand, Colombia and Luxembourg. This series is in terms of active ingredient for most countries, but not for Chile and Mexico.
Source: (OECD, 2020[17]) (OECD, 2019[6]).

Data on import and export of hazardous pesticides that is available to authorities (Customs and the Secretary of Economy) via the Commercial Information System via Internet (SIAVI) platform is inconsistent. More importantly, available information shows that many of the most imported pesticides or their metabolites do not appear at all in the databases and studies, though in many cases they should, taking into account the Mexican agricultural practice. Domestic pesticide production and sales data are available from the Monthly Survey of the Manufacturing Industry conducted by INEGI but this survey has its limitations. More importantly, Mexico have very little information available on the actual uses of pesticides, how much of them are commercialised and applied (Mexican Technical Working Group on Pesticides, 2019[18]). Such information is not required by authorities in the post-registration stage, for instance during the renewal of a pesticide registration. There is no general obligation in the regulatory framework to keep the sale register of pesticides, but collection of certain data on pesticides by industry (e.g. records of aerial spraying) is required by the Mexican NOMs.

Information on pesticides sales in Mexico is presented only in terms of total volume, not in volume of active ingredient, which limits the possibility to compare the situation in Mexico with other OECD countries, which, for the most part, do possess data on active ingredients on the market.

Examples from the OECD countries of best practice in requiring and using information on pesticides by authorities, to support decision-making and developing policies and regulatory framework, for instance by using sales reporting information, are available in Chapter 3.

Moreover, a tendency towards crop specialisation according to zones/states, contributes to overuse of pesticides and encourages the use of products, which are considered to be successful in controlling certain pests, even on crops on which they are not authorised to be applied (Sud, 2020[15]). A 10% increase in insecticide intensity (sales per hectare) is associated with a 0.4% decline in the farmland bird index (Guerrero and Muñoz, 2019[19]).

Monitoring of pesticides in Mexico

Collecting monitoring data in food and environment over a prolonged period of time is essential to sound decision-making on pesticide, building public confidence about the use of pesticides and for effective compliance and monitoring (Matthews et al., 2020[20]). On the other hand, “the lack of comprehensive monitoring programme that documents how the regulatory system is working to protect consumers and the environment risks undermining the legitimacy of the system” (Matthews et al., 2020[20]).

Mexico has conducted certain monitoring activities in different parts of the country, covering some pesticides. Historically, the National Centre for Reference of Pesticides and Contaminants (CNRPyC), established in 1991, carried out an annual evaluation programme in zones where there have been malpractices regarding the use and application of pesticides. The regions and crops selected for monitoring were based on the presence of unauthorised pesticide residues. This samples monitoring commenced in mid-2000s (based on the rejections of the Mexican shipments) (Pérez-Olvera, Navarro-Garza and Miranda-Cruz, 2011[21]). Studies on contamination by pesticides were undertaken also by the National Water Commission, CONAGUA. Moreover, a residue monitoring programme, with a focus on export of food products, is in place in Mexico.

In 2019, an examination of pesticide contamination of surface water, groundwater and soil in Mexico was performed as a follow-up to the Mexican National Human Rights Commission (NHRC) Recommendation 82/2018. It was based on scientific information and feedback provided by academia and other non-governmental stakeholders. It collated information from 60 studies dealing with pesticides contamination in various environmental compartments in 125 locations in Mexico. While the study is not a comprehensive picture of pesticides contamination in the country, it clearly shows a link between the agricultural activity and the presence of pesticides in water sources and soil. For instance, in some locations, the concentration of pesticides surpassed the limits set for drinking water and the reference values for soil and water

established by Canada, the United States and WHO (Mexico does not have its own reference values for soil). While the list of pesticides detected in the studies is far from comprehensive, it could be a starting point for the authorities in the context of the increasing the scope of monitoring (Mexican Technical Working Group on Pesticides, 2019[18]).

However, up-to-date monitoring efforts in Mexico have been scattered and driven by various factors, such as scientific interest of the authors, locally determined conditions (e.g. heavy use of pesticides to combat vector diseases) or external drivers (e.g. response to the obligations under the international agreements), but have not constituted a coherent and comprehensive policy and action at national level.

In principle, there is no systematic monitoring of environmental contamination by hazardous chemicals, including pesticides, and their effects on human health in Mexico (NHRC, 2018[22]). It has been partly linked to the lack of resources to perform such monitoring. Moreover, Mexico does not also have binding national reference/limit values for the contamination of water and soil by pesticides.

There are other examples of the (miss-)use of pesticides. _In 1996, there was a mass mortality of catfish in the Mexican Bay of Chetumal due to contamination by various pesticides and other contaminants (it was the first location in Mexico where cancer in fish was detected). The event resulted in more strict control of the sale and use of restricted pesticides. More recently, the exposure of biota to many pesticides (e.g. lindane, DDT, DDE or aldrin) was detected in the areas of Coatzacoalcos and Veracruz, while in Sonora the shrimp production was affected by high concentration of chlorinated pesticides and their metabolites (SEMARNAT, 2017[23]). The presence of prohibited or never registered pesticides in monitoring results in Mexico points for the need of enhanced enforcement efforts (SEMARNAT, 2017[23]).

In relation to human beings, adverse effects of pesticides on human health were found in floriculture applicators who used chlorinated pesticides, women exposed to DDT, DDE or DDD and children living in the areas were chlordane and endosulfan were used. Correlation between exposure to DDE and an increased risk of breast cancer in females and worsening of sperm quality in men was observed (SEMARNAT, 2017[23]).

While Mexico has been monitoring human pesticide poisoning, data have not been updated since 2011-12. . Earlier data shows that there were 2518 deaths from 1995-2011 (Anglés-Hernández, 2018[24]) and almost 68 000 of poisoning from 1995-2012 (NHRC, 2018[22]). It makes it challenging to provide reliable information to decision-makers, for instance in relation to trends in poisoning, effects of initiatives supporting the safe use of pesticides or a potential number of chronic diseases related to poisoning. It is worth noting that the Mexican industry runs two programmes in relation to intoxications by pesticides – ATOX and SINTOX. Some OECD countries, like Canada or the United States (see Chapter 3) require pesticide registrants to report to them all incidents associated with their products.

A study undertaken in the state of Sinaloa found DNA mutations in pilots occupationally exposed to pesticide during aerial application in agricultural fields, a frequent application method in Mexico (Martínez-Valenzuela et al., 2018[25]).

A comprehensive pesticides monitoring programme would assure Mexico's trading partners of the robustness of its regulatory framework. It would also support a timely identification and response to the inappropriate use of pesticides, enhancing confidence among the public that agricultural chemicals remain safe. In this context, it could be noted that many of Mexico's trading partners, such as Canada, the European Union and the United States, have comprehensive residue monitoring programmes in place and release regular reports summarising the findings of these programmes .

Additionally, there are on-going efforts, for instance in Europe under the European Human Biomonitoring Initiative (HBM4EU), to provide information on the actual exposure of humans to chemicals like pesticides and their possible health effects. Such initiatives, aiming to support policy-making can also be of interest to Mexico (HBM4EU, n.d.[26]).

Legal, policy and institutional framework for managing risks to health and the environment from pesticides in Mexico

A pesticides management framework can include various types of instruments, both regulatory-based and market-based.

> *The optimal regulatory strategy does not have to be composed of single policy tools but can involve a mixture of measures and actions such as tax schemes, direct controls, farm certification and self-regulation. In this way the different measures may compensate each one's deficiencies (Skevas, Oude Lansink and Stefanou, 2013[27]).*

The existing policy, or one under development, should take into account various elements such as the human health and environmental benefits from its implementation, and the costs for pesticides users and for authorities. To be able to reflect these elements and to support the transition to more environmentally friendly uses of pesticides, decision-makers need information at their disposal. For instance, on pesticides production or indirect effects of pesticide use (Skevas, Oude Lansink and Stefanou, 2013[27]).

In order to effectively implement the pesticide policy and regulatory framework in the short and long term, a clearly established division of responsibility between the authorities involved in pesticides management at the national and local level is also needed. This should be combined with efficient enforcement provisions and coupled with adequate human, financial and technical resources.

Policy framework

A clear description of the principal objectives of the system is important for authorities, stakeholders and the public. It allows these parties to understand what the system is aiming to achieve. It is also very important to present a hierarchy of objectives to support decision-making, if two or more objectives could be mutually excluding.

Some of the OECD countries, for instance European Union member states in line with Directive 2009/128/EC on the Sustainable Use of Pesticides, adopt national policy documents which set, among other things, objectives, targets, measures and timetables in order to reduce risks and the impact of pesticides on human health and the environment.

Mexico does not have a specific overarching national policy on pesticides. The National Development Plan, which is the country's highest-level policy statement, does not specifically address pesticides. Instead, goals and objectives are included in various policy and regulatory instruments dealing with these substances (SHCP, 2019[28]).

Mexico also has sectorial development plans that address specific portfolios of the different Secretaries. The Agriculture and Rural Development Sectorial Plan 2020-2024 has three main objectives. The third objective states the following: *Increase sustainable production practices in the agricultural and fishing aquaculture sector in the face of agro-climatic risks.* This objective informs the basis of several specific action plans including the following: *Promote regulatory standards for the use of pesticides and the coordination of local and territorial actions to protect the survival, biodiversity and abundance of pollinators.*

The Health Sectorial Plan 2020-2024 does not directly address the effects of pesticides in relation to human health. The Environmental and Natural Resources Sectorial Plan 2020-2024 addresses pesticides as part of an assessment of water contamination, but does not specifically address them in concrete action plan.

Instead, goals and objectives are included in various policy and regulatory instruments dealing with pesticides. For instance, in line with SENASICA's internal rules of procedure, its role is to propose to the Secretary of Agriculture a national policy aiming to reduce the risks in agro fishery production and to the public health. Similarly, COFEPRIS has the authority to propose to the Secretary of Health a preventive public policy on hazardous substance (covering pesticides) (NHRC, 2018[22]). Moreover, each of the laws,

regulations or Official Technical Standards linked to the pesticides management include specific goals and objectives either in its preamble or as part of the provisions within the main text.

Taxation of pesticides

> *Pesticide and fertiliser taxes can form an important component of a coherent set of policies aimed at reducing use and risks. (…)The low price elasticity of demand necessitates that the tax rate for pesticide and fertilisers be set relatively high to generate decline in their use. Pesticide tax rate in France and fertiliser tax rates in the United States have been too low to incentivise reduction in use (Sud, 2020[15]).*

A tax on pesticides can correct certain market failures, for instance their social and environmental costs, and can generate revenues that could support addressing the negative impacts of pesticides or adopting more sustainable practices. The design of the tax entails the definition of the tax base, the tax rate, the point of application and the revenue allocation. Tax rates can vary depending on the toxicity of the substance. Measures can be included in the tax design to streamline the tax revenues to the agriculture sector and support its acceptance by affected stakeholders (UNDP, 2017[29]).

> *Unlike uniform taxes (ad valorem or per unit), differentiated taxes rates that place a higher burden on substances with higher environmental (and health) risks, create incentives for a move towards lower-risk substances. Such differentiated tax systems have been employed for pesticide taxes in Sweden, Norway, Denmark, France and Mexico (Sud, 2020[15]).*

Differentiated taxes are considered superior to undifferentiated taxes because allow faster reaching the policy goals (Böcker and Finger, 2016[30]).

Mexico is one of the few OECD countries (others are Denmark, France, Italy, Norway and Sweden) that have implemented broad pesticide taxes to reduce pesticide risks (Guerrero and Muñoz, 2019[19]). The Mexican Tax Administration Service (Servicio de Administración Tributaria, SAT, in Spanish) is responsible for taxes at federal level. Pesticides are taxed in Mexico depending on their acute toxicity hazard category. Category 1 and 2 pesticides are taxed at the 9% tax rate, category 3 at 7% rate and category 4 at 6% rate. The least toxic pesticides are exempted from taxation (SAT, 2014[31]). The tax currently does not take into account chronic toxicity. All parts of the supply chain are subject to the tax. The tax revenues from the pesticide tax were USD 109 million (MXN 2 133.32 million) from February 2014 to September 2017 period (Sud, 2020[15]).

Taxation of pesticide was introduced in 2014 and it would be of benefit to evaluate the effects of the pesticides tax in Mexico after a set period of time to determine if it brought the expected results in decreasing the use of the most hazardous products. Moreover, the impact of the current system of VAT exemption for pesticides could also be analysed. Should the latter be shown to have a negative impact on realising the benefits of the pesticide tax, this could suggest that co-ordination among the regulators could be improved.

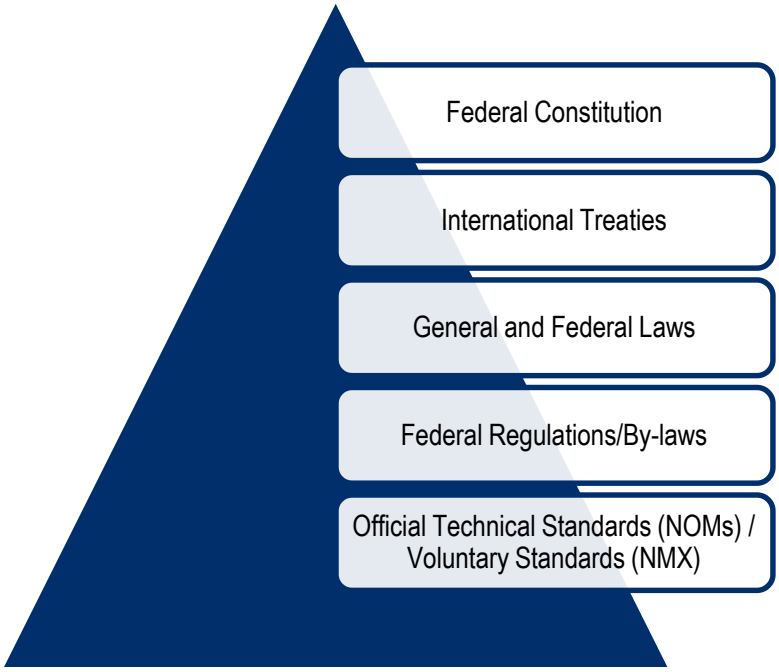
Legal and regulatory framework on pesticides management

This chapter provides an overall presentation of Mexico's policy framework including the legal and regulatory structure. However, the regulatory framework is also discussed in more detail in Chapter 2, mostly as it relates to the assessment and registration of pesticides.

Many factors influence national pesticides regulatory frameworks. They include culture, politics, economy including trade, health or food security aspects. The level of the development of the country is also relevant. In some cases, even if legislation is sufficient, compliance monitoring and enforcement can be inadequate due to the lack of resources for inspections (Handford, Elliott and Campbell, 2015[32]).

As background to the regulatory framework in Mexico, the following describes the general hierarchy of various legal instruments in Mexico (Figure 1.5).

Figure 1.5. Hierarchy of the Mexican sources of law



Source: Author's elaboration.

The Federal Constitution is the ultimate source of law in the country. Federal laws in principle distribute powers across the federal, state, and local levels and establish overarching policies. They are implemented by federal regulations. Finally, the Official Technical Standards, known as NOMs, are legally binding technical regulations. In principle, the subject of the regulatory actions must be reflected at all levels of law set out above to be operational. The laws, regulations and NOMs need to be coherent and complement each other.

Federal Constitution and a historical evolution of the regulatory framework on pesticides in Mexico

The protection of health and the environment (linked to the sound management of pesticides) is reflected in several articles of the Mexican Federal Constitution. Article 1 addresses the protection of human rights, Article 4 the protection of human health, Article 6 the right to information, Article 27 water and soil and Article 123 the protection of workers (Albert, 2019[33]).

The first Mexican regulatory framework dealing with pests, the Law on Pests, dates back to 1924. The 1940 Plant and Animal Health Law was adopted just before synthetic pesticides began to be used around the world (including in Mexico) and remained in force until 1974. In 1982, an official report analysed the deficiencies of the regulatory system for pesticides in Mexico. It supported implementing a regulatory framework addressing pesticides control, and that framework was issued in the 1980s. The regulation of occupational safety in relation to pesticides began in the 1990s (Albert, 2019[34]).

Pesticide regulation in Mexico is scattered in different laws…

The following three general or federal laws constitute are the most important for the pesticides management framework in Mexico:[2]

- the 1984 General Law of Health (GLH), regulating main elements of the life cycle of pesticides;
- the 1988 General Law of Ecological Balance and Environmental Protection with a goal to prevent soil and water contamination (GLE); and
- the 1994 Federal Plant Health Law (FPHL).

GLH focuses on human health effects of pesticides use and defines responsibilities for the Secretary of Health (SALUD). The GLE mostly regulates impacts on soil and water contamination due to pesticides and defines responsibilities of the Secretary of Environment and Natural Resources (SEMARNAT). The FPHL regulates the impact of pesticide in vegetation and defines the responsibilities of the Secretary of Agriculture and Rural Development (SADER). Table 1.5 summarises the role of these laws in the pesticide management scheme in Mexico.

Table 1.5. Main general or federal laws on pesticides in Mexico

	Key role of the legislation
General Law of Health	Establish the classification and characteristics of the different pesticide products in order to categorise them according to the risks they pose directly or indirectly on human health. Authorise the ingredients used in pesticides and plant nutrients, as well as materials used as inputs, which should not be toxic or increase the toxicity of pesticide or vegetal nutrient. Authorise the process of persistent and bio-cumulative pesticides, of any chemical composition, for those which do not harm or imply a peril to human health and when their substitution is not possible. Establish, in coordination with relevant authorities, technical regulations that specify the conditions that pesticides must comply with regards to formulation, packaging, transportation, commercialisation and use, in all of its lifecycle. SALUD will outweigh the opinion of other regulators when human health must be safeguarded. Develop technical regulations for the protection, process, use and application of pesticides, vegetal nutrients and toxic or dangerous substances. Supervise that the packaging of pesticides must include, in Spanish, the information of the risks implied in using the product
Federal Plant Health Law	Develop the specifications for field studies that establish maximum residue limits of pesticides. Evaluate the biological efficacy of pesticides and regulate their phytosanitary use. Direct SADER to cooperate with SALUD to supervise and implement the compliance of technical regulation. Develop a National Supervising Program for Pesticides' Residues, to determine that phytosanitary inputs are complying with established limits. Promote a program to reduce contamination risks for agricultural production through empty containers collection, in collaboration with Semarnat
General Law of Ecological Balance and Environmental Protection	Ensure that the use of pesticides is compatible with the ecosystem equilibrium and must consider its effects on human health. In case of soil contamination due to toxic waste, conduct necessary actions to recover or establish the initial conditions, so that any activity permitted in the urban development plan can be carried out. Define the criteria to prevent and control soil contamination, which should be considered in the authorisation to produce, import, use activities related to pesticide Forbids the authorisation of pesticide imports which use has been banned in the country of origination. Defines as federal jurisdiction the rules for the fabrication of pesticide raw materials.

Source: (Congreso de la Unión, 2019[35]), (Congreso de la Unión, 2017[36]) and (Congreso de la Unión, 2017[36]).

Apart from the three general or federal laws described above, the 2003 General Law on Prevention and Integral Management of Waste (LGPGIR) requires that pesticides and their containers are treated as hazardous waste and subject to a management plan (NHRC, 2018[22]). The 1970 Labour Law provides power to the Labour Secretary for its participation in pesticide regulation since it aims to promote safety in the workplace (Romero Torres, 2006[37]). Moreover, certain aspects of pesticides management are addressed by the legislation on sustainable rural development, roads, bridges and car transport, custom law and external commerce law (Albert, 2019[34]).

In relation to storage and transport of pesticides in Mexico, pesticides cannot be transported together with food or other products that can be contaminated by them, for instance toys or clothes. They cannot be stored next to the driver or in the vehicle cabin. Companies in Mexico are required to store pesticides in a separate, clearly marked area (identified within the plan of the site) and should take into account potential risks, like leakage. Companies are not permitted to store pesticides together with fertilizers or other products (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 1984[38]).

Definitions

According to FAO and WHO, a regulatory framework on pesticides should include a clearly defined scope and definitions (aligned with those provided in the FAO and WHO Code of Conduct on Pesticide Management or the applicable pesticides and chemical multilateral environmental agreements) (FAO & WHO, 2013[39]).

Under the FAO and WHO Code of Conduct on Pesticide Management, the term "pesticide" is defined as: "any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth" (FAO & WHO, 2013[39]).

The principal definition of a "pesticide" in the Mexican regulatory framework is included in Article 278 of the 1984 General Law of Health. It defines a pesticide as: "any substance of mix of substances aimed at controlling any plague, including the vectors transmitting human and animal diseases, unwanted species that cause harm or interfere with the agricultural and forestry production, as well as defoliant and desiccant substances" (Congreso de la Unión, 2019[35]).

It is not, however, the only definition included in the Mexican laws, as Article 5 of the Federal Law of Plant Health (LFSV) defines a pesticide as: "phytosanitary inputs aimed at preventing, repelling, fighting and destroying the biological organisms harmful to plants, their products or byproducts" (Congreso de la Unión, 2017[36]).

The PLAFEST Regulation applies the definition used in the General Law of Health and additionally defines different types of pesticides based on their composition (e.g. chemical or botanical pesticide) and use (e.g. for agriculture or forest use) (Chapter 2).

Harmonisation of the two definitions used in GHL and LFSV could be considered by Mexico to streamline the existing legal framework and provide more clarity to stakeholders.

On the other hand, it has been raised by stakeholders that the current regulatory framework for pesticides in Mexico does not easily accommodate new, lower risk products (e.g. bio-pesticides). In particular, existing definitions create challenges for both regulators (in the evaluation and registration processes) and industry (for instance in relation to the data to be provided).

Highly hazardous pesticides

According to FAO and WHO guidelines, Highly Hazardous pesticides (HHPs) are

> *pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous (FAO & WHO, 2016[40]).*

In 2015, the SAICM International Conference on Chemicals Management adopted a resolution that recognised HHPs as an issue of concern and encouraged countries to strengthen national regulatory capacity to address such pesticides. It proposes, among other things, to identify such pesticides by examining the lists of registered pesticides and to revise the registration systems by:

- defining protection goals and unacceptable risks in the pesticide legislation;
- strengthening registration procedures; and
- performing risk assessment based on HHP criteria (FAO & WHO, 2016[40]).

The Mexican General Law of Health states that the use of persistent and bio accumulative pesticides can only be authorised if they are not dangerous for human health and it is not possible to replace them with less hazardous ones. However, Mexico does not have a clear definition and criteria for registration decisions, i.e. it does not refer, in principle, to unacceptable risk nor define it. The General Law of Health mentions only "acceptable risk" and only in relation to the transplantation of organs. The PLAFEST Regulation refers to the risk to the environment or human health that cannot be managed but only in the context of registration of pesticides destined solely for export and not to be commercialised in Mexico. Mexico has a pesticide classification in place (via the Official Technical Standard NOM-232-SSA1-2009), where the toxicity classification is based on the WHO criteria (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 1984[38]). This NOM does not specify when the risk is considered unacceptable and a registration should not be granted or be granted with restrictions. The lack of clear definitions and decision criteria make the system less transparent and it can also lead to inconsistencies in decision making.

A key subordinate regulation is the 2004 Regulation on the subject of registrations, import and export authorizations, and export certificates for pesticides, plant nutrients, and toxic or hazardous chemicals and materials (PLAFEST)(Box 1.1).The PLAFEST regulation was last reformed in 2014.

Box 1.1. The PLAFEST Regulation

Topics addressed in the PLAFEST Regulation:

- Definitions;
- Responsibilities of the Agriculture, Health and Environmental Secretaries in Mexico (and their decentralised bodies, like SENASICA and COFEPRIS);
- Pesticides studies required for registration (with exemptions) on physico-chemical, toxicological, ecotoxicological, environmental fate and physical properties;
- Pesticides registration procedure (more detailed information can be found in Chapter 2);
- Pesticides import authorisations;
- Pesticides export authorisations and certificates.

Source: (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 2014[41]).

However, there are at least 10 additional applicable regulations (by-laws) on pesticides, for instance the implementing regulations for GLE or GLH (Albert, 2019[34]). This, together with a broad scope of the existing framework (covering vegetal nutrition inputs, fertilisers, as well as other hazardous materials), can make the regulatory environment complex and difficult to understand and implement, with responsibility shared across multiple ministries and agencies.

Official Technical Standards (NOMs)

As of the 1990s, Mexico has adopted Official Technical Standards (NOMs) to address certain technical aspects of pesticide management. Currently there are more than twenty NOMs dealing with pesticides. For instance, seven NOMs are linked to the evaluation of data, nine on procedural aspects of registration, and four on labelling and packaging. However, there are no NOMs that regulate the amount of pesticides in soil, sediments, surface water, wastewater or air (Albert, 2019[34]). In line with PHL, the NOMs should

take into account applicable international standards, directives and recommendations, whose provisions may not have been totally observed in the past (NHRC, 2018[22]).Table 1.6 lists some of the key NOMs for the Mexican pesticide management framework.

Table 1.6. Main Mexican Technical Standards (NOMs) on pesticides management

NOM ID	Date of issue	Description
NOM-032-SAG/FITO-2014	11-Aug-2015	Establishes requirements and phytosanitary specifications regarding the conduct of biological efficacy studies of pesticides.
NOM-033-FITO-1995	1996-06-24	Establishes requirements and specifications regarding the notification of the start of operation, which is required from those interested in the commercialisation of agricultural pesticides It creates, among other things, obligations to sell only registered pesticides and not to sell expired, counterfeit or illegal pesticides, or re-labelled/re-packed pesticides. It also requires training for personnel that sell pesticides.
NOM-034-FITO-1995	1996-06-24	Establishes requirements and phytosanitary specifications regarding the notification of the start of operation, which is required from those interested in the production, formulation or import of agricultural pesticides It makes those who are subject to the NOM responsible for information included on the label (direction of use, authorised crops, common and scientific name of the pest, field application instructions, and pre-harvest intervals). It obliges the subjects of the NOM to provide technical advice to distributors and retailers, and to control produced or formulated pesticides (quantity, date of production and distribution).
NOM-052-FITO-1995	1997-06-10	Establishes requirements and phytosanitary specifications regarding the notification of the start of operation, which is required from those who dedicate themselves to the aerial application of agricultural pesticides. It obliges, among others, persons subject to the NOM to use only registered pesticides and not to apply expired, counterfeit pesticides, or pesticides outside of their specifications. It also requires that users make sure that pesticides are applied in line with the conditions stipulated by the registry and only in appropriate environmental conditions, as well as to capacitate its personnel. Verification that the application equipment meets technical criteria for efficient application is also needed.
NOM-057-FITO-1995	1996-07-30	Establishes requirements and specifications to issue the technical opinion of the pesticides waste analysis.
NOM-082-SAG-FITO/SSA1-2017	2017-10-04	Establishes, for the first time in Mexican history, setting MRLs in food, as well as includes technical guidelines and authorisation and revision procedures.
NOM-232-SSA1-2009	2010-04-13	Establishes requirements for containers, packaging and labelling of pesticides.
NOM-003-STPS-2016		Establishes health and safety conditions for agricultural activities, especially during the use of pesticides. Its limitation is that it does not apply to a significant part of the agricultural zones in the country

Institutional framework

In line with FAO/WHO recommendations, a competent authority (or competent authorities) should be in place to co-ordinate the implementation of the pesticides regulatory framework and be equipped with the power to regulate, charge fees and enforce (FAO & WHO, 2015[42]).

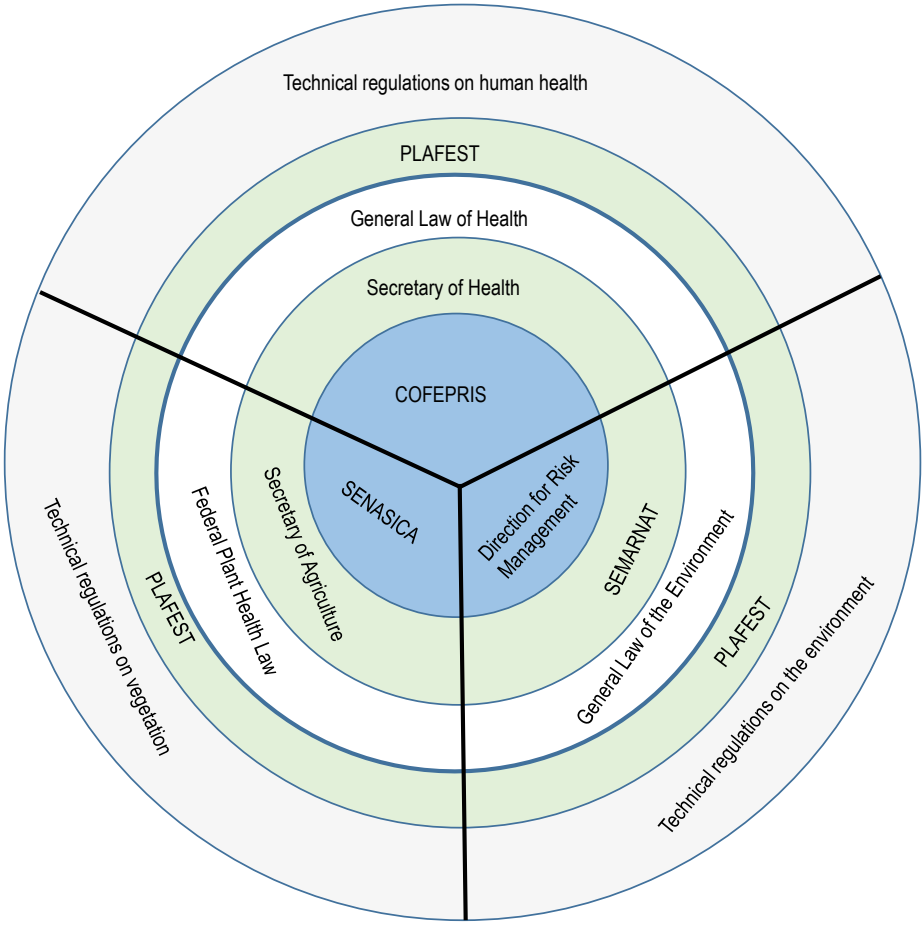
To co-ordinate the work of various Mexican authorities on pesticides, In 1987, an inter-institutional body was established, the Inter-Secretarial Commission on the Control of the Process and Use of Pesticides, Fertilizers and Toxic Substances, known as CICLOPAFEST (Albert, 2019[34]).

In practice, the same authorities, responsible for Health, the Environment and Agriculture (in 1987 also Commerce and Industrial Development and later on Communication and Labour were included) are in charge of pesticides management in Mexico now. They include the Federal Commission for the Protection against Sanitary Risks (COFEPRIS), a deconcentrated body under the Secretary for Health and

established In 2003, the Secretary for Environment and Natural Resources (SEMARNAT) and the National Service of Sanitation, Safety and Agricultural Quality (SENASICA), a decentralised body of the Secretary for Agriculture (SADER). Pesticides registration, production, import, export and use are granted jointly by the COFEPRIS, SEMARNAT and SENASICA.

These three authorities are responsible for the pesticide registration process. Figure 1.6 shows the relationship between the main legal instruments and COFEPRIS, SENASICA and SEMARNAT. The diagram also shows how each authority is responsible to manage the NOMs related to their portfolio.

Figure 1.6. Authorities and legal instruments involved in pesticide registration in Mexico



Note: For a complete list of NOMs and legal instruments related to pesticides (see Annex A).
Source: (Congreso de la Unión, 2019[35]), (Congreso de la Unión, 2017[36]), (Congreso de la Unión, 2019[43]).

COFEPRIS is the authority for regulation, control and enforcement in relation to activities that require an authorisation or sanitary permit, linked to the elaboration, manufacture, preparation, export and import of pesticides. COFEPRIS is authorised to regulate and control human health risks generated by sites where pesticides are managed, therefore it can regulate the use, import, export, application and disposal of hazardous pesticides, including by preparation of the NOMs. COFEPRIS is the authority that can propose to the Secretary of Health a national policy on sanitary risk protection covering pesticides. COFEPRIS is in charge of issuing the certifications for registration, as well as for import and export licenses. COFEPRIS is led by the head Commissioner and has five inner commissions: Commission for Evidence and Risk Management, Commission for Sanitary Promotion, Commission for Sanitary Authorization, Commission for Sanitary Operation, Commission for Analytic Control and Coverage Expansion. Additionally,

COFEPRIS has a Federal Coordination Direction, which leads the regional offices of COFEPRIS (NHRC, 2018[22]) (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 1984[44]) (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 2014[41]). COFEPRIS was designed as a regulator with technical and operation independence within the Secretary of Health. However, during this review COFEPRIS was absorbed by the Undersecretary of Health.

SEMARNAT is in charge of designing and overseeing the implementation of regulation that protects soil and water resources, among others. It works to make sure that the fabrication and use of pesticide is not causing environmental damage. It is responsible for environmental risks and impact of pesticides (i.e. for emitting technical opinions linked to the environmental protection and authorisation of export and import of pesticides), pesticides waste management and empty containers. Within SEMARNAT, there is a body called Federal Attorney for Environmental Protection (PROFEPA). PROFEPA investigates and litigates breaches of law from industry regarding environmental law (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 1984[44]) (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 2014[41]).

The main goal of **SENASICA** is to protect the safety of agriculture, cattle and fishery resources from plagues and diseases. Moreover, it has the goal of certifying risk reduction systems and quality of food systems. It is responsible for biological efficacy, pesticides residues in the field, phytosanitary aspects of MRLs, and determining what pesticides can be used in the case of emergency. SENASICA has four General Directorates that manage the technical responsibilities: General Direction for Plant Health, General Direction for Agri-food, Fisheries and Aquaculture Safety, General Direction for Animal Health, General Direction for Plan and Animal Health Inspections. Additionally, SENASICA has a General Legal Direction and a Management and IT General Direction (NHRC, 2018[22]) (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 1984[44]) (Mexican Congress (Congreso de los Estados Unidos Mexicanos), 2014[41]).

In line with FPHL, **SADER** is responsible for the promotion, co-ordination and control of phytosanitary activities. It is also responsible for their harmonisation with international standards and directives, for instance in the area of field studies required for establishing MRLs. SADER also runs the National Monitoring Programme for residues of pesticides in plants. Many of these responsibilities are executed through SENASICA.

The **Secretary of Economy** (SE) is a key agency in the design, development and implementation of technical regulation in Mexico. The General Direction for Technical Regulation manages the process to publish NOMs, including those proposed by COFEPRIS, SEMARNAT and SENASICA related to pesticides. SE manages the public consultation process specifically designed for NOMs and heads the working groups that include government agencies and other stakeholders.

Secretaries of Finance and Public Credit, Communication and Transport, Labour and Social Security are also involved, to some extent in pesticides management in Mexico. The Secretary of Labour regulates and works as the oversight body for labour regulations. In this sense, it has the responsibility of establishing safety conditions for workers in the pesticide industry (and in the workplace in general) and to ensure that said regulation is being implemented accordingly. The Tax Revenue Authority, a body within the Ministry of Finance, has a big stake in international trade for pesticides. This authority designs and manages tariffs for international trade and oversees the customs. The Health Secretary (SALUD) manages a registry of intoxications and deaths related to pesticides.

In general, it is the Mexican National Institute of Ecology and Climate Change (INECC) that is responsible for environmental monitoring of pesticides (SEMARNAT, 2017[23]). CONAGUA is an administrative, technical advisory commission of Mexico's Ministry of the Environment and Natural Resources (SEMARNAT). CONAGUA administers national waters, manages and controls the country's hydrological system, and promotes social development.

As described above, several Mexican authorities are responsible for the implementation of various aspects of pesticides management. This renders the effective implementation of the system difficult. As expressed by the NAFTA's Environmental Co-operation Commission, the regulatory framework for chemicals in Mexico is one of the most complicated and confusing parts of the country's environmental framework (Albert, 2019[34]). Moreover, as different regulators implement the pesticide regulatory framework in the context of their own overarching legal framework, they may have varying priorities and policy goals in relation to pesticides, which in turn, affects the processes, timelines and co-ordination mechanisms in place. Chapter 3 presents examples of streamlining the institutional framework for pesticides management in Australia, Canada and the United States and its relevance for achieving pesticide policy objectives.

Potential challenges with the implementation of the pesticide management framework in Mexico

The provisions of the Federal Constitution are sufficiently broad to allow addressing pesticides management in Mexico comprehensively. However, the provisions led to the adoption of separate legal instruments dealing with pesticides (e.g. General Law of Health or Law of Ecological Balance and Environmental Protection), therefore not necessarily supported consistency and co-ordinated approach.

Mexican laws require a specific regulatory framework to be operational (both implementing regulations and Official Technical Standards). In this respect, one may observe that many Mexican Technical Standards were adopted many years ago would require revision, If fact, some are in the process of the revision and some have just been adopted or need to be adopted. A vast number of legal instruments on pesticides in Mexico require efforts to ensure their coherency and to avoid gaps and loopholes in the regulatory framework.

A Mexican author specialising in pesticides management, analysed conditions for the regulatory framework to be effectively implemented in Mexico and concluded that in practice many conditions are not fulfilled and there is no real control of the use of pesticides in Mexico. She compared the existing framework in Mexico with the model FAO directives and also revealed certain loopholes. Many of the suggestions for improvement are echoed in the National Human Rights Commission Recommendation 82/2018 (Chapter 2). The author also proposed to prepare a study to estimate the direct and indirect costs stemming from the gaps and inefficiencies of the existing regulatory framework in Mexico (Albert, 2019[34]).

While Mexico has had co-ordination mechanisms for pesticides management for many years, the co-operation between the authorities has not always been smooth. To improve this, an inter institutional co-ordination body, Inter-Secretary Commission on Pesticides Regulation, was established in 2019 (Chapter 2).

As of 2010, Mexico has also in place an Inter-Institutional Committee for the Evaluation and Monitoring of the National Monitoring Programme for the Control of Residues and Contaminants in Animal Products and Sub Products. It is co-ordinated by SADER with the participation of SEMARNAT and industry and academia. SENASICA is responsible for the monitoring of the Programme and CENAPA (under SENASICA) is the official laboratory (Albert, 2019[34]).

It is also important to demonstrate whether the pesticide management system is achieving its objectives. This includes communicating the outcomes of monitoring and enforcement activities (Matthews et al., 2020[20]). In practice, Mexico does not have a formal process for measuring the performance of national authorities responsible for pesticides management activities including monitoring, compliance and enforcement. Chapter 3 presents the Regulatory Performance Framework, an annual self-evaluation required by all regulators in Australia, that include multiple indicators. This framework allows for external scrutiny from other government agencies and from private stakeholders.

Resourcing of pesticide management in Mexico

The main funding source of the work of the authorities responsible for the pesticide management is the federal budget proposed by SCHP and approved by Congress. The authorities are also authorised to charge fees for their services, in line with the Federal Law on Rights. In principle, they should cover the total cost of the service. The fees are adjusted on a yearly basis, based on the National Consumer Price Index (SENASICA, 2020[45]). The fees depend on the toxicity of pesticides, similarly as the tax on pesticides in Mexico. They vary between USD 1 000 and 4 000 (for the most toxic products). Fee for the renewal of the registration is 50% lower (Secretariat of the Rotterdam Convention, 2019[46]). However, revenue from these fees is collected by the central treasury from the Ministry of Finance, not by pesticide regulators. This differs from the practices of pesticide regulators from OECD countries. Having adequate and predictable resourcing is essential to deliver high-quality regulatory services, and to keep technology infrastructure updated. An updated cost-recovery model has proven successful in Canada and Australia.

The information provided by authorities in the process that took place in 2017-18 and led to the preparation of the NHRC Recommendation 82/2018 showed that additional resources are needed. For instance, SENASICA indicated that it does not have the necessary human or technical resources to verify the quality of pesticides (NHRC, 2018[22]).

In 2019, SENASICA had six employees dealing with pesticides tasks, including preparing the biological efficacy opinions, technical opinions for the registration of pesticides, as well as performing certification and training. (SENASICA, 2020[45]). SENASICA and SEMARNAT had two employees dedicated to pesticides registration only. COFEPRIS is said to have more, but the exact number is not available (Secretariat of the Rotterdam Convention, 2019[46]).

The authorities, like SENASICA, often have annual training programmes for their employees. This allows them to enhance their capacities in dealing with pesticides, subject to available financing. However, at the same time the general view is that Mexican authorities struggle with insufficient trained resources. For instance, SENASICA considers that increased capacity is needed to address new pesticide technologies (e.g. bio-pesticides or application by drones), for conducting field studies to establish MRLs and to perform risk management (SENASICA, 2020[45]). However, there is a lack of resources for training.

In general, Mexico has not assessed the implementation costs of its regulatory framework on pesticides, with the exception of the costs of the collection of empty containers. In this case, a study estimated that 30 million Mexican Pesos are needed yearly. The responsible authorities receive about 10% of this amount (SENASICA, 2020[45]). A useful example is Australia's effort described in Chapter 3, to understand its necessary funding to cover an efficient pesticide management system.

Support to agriculture and the share of most distorting forms of support decreased since the 1990s in Mexico. This trend has partly changed since the 2000s, as input-based and market price support (considered to have potential to harm the environment) have increased. Few support programmes in Mexico require compliance with good environmental practices. This could be improved by imposing environmental conditionality (OECD, 2019[1]).

Stakeholder engagement

Stakeholders demand information on pesticides. Public perception and awareness of the health and environmental impacts of pesticides are increasingly becoming important factors affecting pesticide management schemes and food supply chains.

One of the major challenges in providing relevant practical information and available solutions for pesticide management in Mexico is the large number and diversity of agricultural producers (Sud, 2020[15]).

In line with the Mexican Federal Law on Metrology and Standardisation,[3] industry and other stakeholders are involved in the preparation of the NOMs. Moreover, the Mexican General Law for Transparency and Access to Public Information establishes that all information is public, except that classified as reserved or confidential (SENASICA, 2020[45]).

The first Mexican National Forum on Pesticides, grouping governmental and non-governmental (industry, NGOs and academia) stakeholders took place in 2018. It gathered over 100 participants from national and local government, industry, academia and NGOs to discuss the possibilities to improve the Mexican regulatory framework on pesticides. The discussion focused on three areas, agricultural regulation, environmental regulation and sanitary regulation (SEMARNAT, INECC, UN Environment and PAHO[47]). In the follow-up to the Forum, a Technical Working Group has prepared a set of proposals, "Elements for the Development of an Integral Strategy for Responsible Pesticides Management in Mexico" (Mexican Technical Working Group on Pesticides, 2019[18]). As described in Chapter 3, the UK has been using, for many years, its Pesticides Forum as a tool for stakeholders' engagement and in support to its National Action Plan for Sustainable Use of Pesticides. Chapter 3 also presents the platforms used by the United States to engage with stakeholders in different pesticide subjects.

Mexico is open to recognising industry efforts, for instance, in relation to good agricultural practice, accreditation of permit and registration holders, and training and licensing requirements for the supply and use of pesticides. This is addressed in detail in Chapter 2.

International regulatory co-operation for pesticide regulation

Mexico's international activities related to pesticides management focus on three main areas:

- work with Canada and the United States;
- implementation of the FAO/WHO Codex Alimentarius and relevant Multilateral Environmental Agreements; and
- co-operation under the OECD umbrella.

Mexico co-operates on pesticides also as part of other multilateral or bilateral agreements, for instance under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, the Pacific Alliance, the AsiaPacific Economic Cooperation or in co-operation with Colombia, Ecuador, Israel and Turkey. Having mandates and explicit criteria on how to accept international assessments in the area of pesticides management is key to attain benefits from international integration while ensuring domestic independence. Australia has adopted a well-specified criteria to accept international standards (see Chapter 3).

North American co-operation: NAFTA/T-MEC

In 1994, the North American Free Trade Agreement (NAFTA) came into force, which led to co-operative efforts to harmonise pesticide regulatory requirements between Mexico, Canada and the United States. The NAFTA Agreement included provisions on agriculture, sanitary and phytosanitary measures to protect human, animal or plant life or health. In 1996, as a way to increase regulatory co-operation among NAFTA countries, the Technical Working Group on pesticides (TWG) was created (NAFTA Technical Working Group on Pesticides, 2001[48]).

The TWG includes representatives from the most relevant Mexican authorities for pesticides: SADER (SENASICA), SEMARNAT and COFEPRIS, as well as Health Canada's Pest Management Regulatory Agency (PMRA) and the U.S. Environmental Protection Agency's (EPA) Office of Pesticide Programs (OPP).

The main goal of the TWG is to reduce trade barriers generated by regulatory differences and address issues such as differing data requirements for pesticide registration, dissimilar formats for data submission and disparate scientific assessments of pesticide data. In consequence, in 2001 the TWG identified relevant elements that should be improved in order to minimise barriers to trade:

- Data requirements;
- Relevant test protocols;
- Data submissions (dossiers) and study report formats (monographs);
- Data review and risk assessment practices;
- Regulatory decision making; and
- Administrative processes and procedures (NAFTA Technical Working Group on Pesticides, 2001[48]).

The TWG has produced guidance documents, organised capacity building workshops and every five years produced a document with the strategy and priority areas for the period. For instance, the NAFTA Maximum Residue Level (MRLs)/Tolerance Harmonisation Workgroup developed a spreadsheet to calculate pesticide MRLs to co-ordinate the pesticide regulatory framework among NAFTA countries (Handford, Elliott and Campbell, 2015[32]). This was later replaced by the use of the OECD MRL calculator.

Another product of this international co-operation was the 2006 NAFTA Import Tolerance Guidance Document that details the product chemistry, residue chemistry, and toxicology data requirements that meet NAFTA standards for the establishment of import tolerances or MRLs in Canada and the United States. This common approach to establishing import tolerances was expected to promote trade between North America and the rest of the world. Mexico has not, however, participated in this project (EPA[49]).

The NAFTA Agreement was replaced in 2018 by the T-MEC Agreement,[4] but the co-operation on pesticides continues under the TWG. Currently such co-operation takes place under Chapter 9 of the T-MEC Agreement on Sanitary and Phytosanitary Measures (SPS) and under the supervision of the Committee on Sanitary and Phytosanitary Measures (Box 1.2).

The T-MEC Agreement (as it was with the NAFTA Agreement) does include provisions and mechanisms that provide an opportunity for strengthened co-operation on pesticides management between the countries. Unfortunately, these provisions and mechanisms have not been fully explored by Mexico to date. One of the reasons for this situation could be the complexity of the regulatory and institutional framework on pesticides management in Mexico. With the adoption of the PLAFEST Regulation in 2014, and the inclusion of a provision on the joint evaluation request therein (Chapter 2), Mexico has evidently tried to boost the tripartite co-operation. Unfortunately, this provision has not yet been applied in practice.

The most recent policy and regulatory efforts in Mexico as well as changes expected in the future, described in more detail in Chapter 2, constitute a major opportunity to reinvigorate the co-operation on pesticides under the T-MEC Agreement. Moreover, the objectives of the co-operation agreed under the current 2016-20 Strategy of the TWG (e.g. on pesticides' registration review and re-evaluation or minor uses) (Box 1.2) can clearly support the on-going regulatory discussions and reforms in Mexico.

Box 1.2. Tripartite co-operation on Pesticides under the T-MEC Agreement

Main objectives of the co-operation on sanitary and phytosanitary measures (Article 9.3):

- protect human, animal, or plant life or health in the territories of the Parties while facilitating trade between them;
- strengthen communication, consultation, and co-operation between the Parties, and particularly between the Parties' competent authorities;

- ensure that sanitary or phytosanitary measures implemented by a Party do not create unnecessary barriers to trade;
- enhance transparency in and understanding of the application of each Party's sanitary and phytosanitary measures;
- encourage the development and adoption of science-based international standards, guidelines, and recommendations, and promote their implementation by the Parties;
- enhance compatibility of sanitary or phytosanitary measures as appropriate; and
- advance science-based decision-making.

The Agreement states (Article 9.16.5) that if there is mutual interest, partiers are encouraged to:

- if feasible and appropriate, undertake science-based joint risk assessments;
- if applicable and in accordance with the procedures, policies, resources, laws, and regulations of each Party, provide access to their respective completed risk assessments and the data used to develop risk assessments; or
- if appropriate, co-operate on aligning data requirements for risk assessments.

Objectives of the work of the Technical Working Groups (Article 9.18.4):

- engage, at the earliest appropriate stage, in scientific or technical exchange and co-operation regarding sanitary or phytosanitary matters;
- consider any sanitary or phytosanitary measure or set of measures identified by any Party that are likely to affect, directly or indirectly, trade, and provide technical advice with a view to facilitating the resolution of specific trade concerns relating to those measures;
- serve as a forum to facilitate discussion and consideration of specific risk assessments and possible risk management options;
- provide an opportunity for Parties to discuss developments relevant to the work of the technical working group;
- discuss other issues related to this Chapter; and
- report to the SPS Committee on progress of work, as appropriate.

Objectives of the 2016-20 Strategy of the Technical Working Group on Pesticides:

- Identify trade barriers and approaches to promote equal access and simultaneous introduction for pest management tools.
- Encourage co-operation on joint reviews of new pesticides and uses (including minor uses), and the re-evaluation/re-registration review of pesticides to increase efficiency and quality of decision-making.
- Work co-operatively on priority science and regulatory issues and practices including data requirements, science approaches and policies for data interpretation, and risk assessment and communications of regulatory decisions.

Source: (Government of Mexico, 2019[50]; NAFTA Technical Working Group on Pesticides, 2016[51]; USMCA[52]).

FAO/WHO Codex Alimentarius and multilateral environmental agreements

FAO/WHO Codex Alimentarius

FAO/WHO Codex Alimentarius, or "Food Code" is a collection of standards, guidelines and codes of practice adopted by the Codex Alimentarius Commission (FAO & WHO[53]). Mexico adopted to the Codex Alimentarius in 1969.

The Mexican industry has in place voluntary programmes implementing FAO and WHO guidelines on pesticides management that could be considered as co-regulatory mechanisms, including the international code of conduct on pesticide management (FAO & WHO, 2014[54]) and registration toolkit (FAO, n.d.[55]). Initiatives like CUIDAGRO-BUMA, *Campo Limpio* and SINTOX are described in more detail in other parts of this report.

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

The Rotterdam Convention covers pesticides and industrial chemicals banned or severely restricted for health or environmental reasons. Its objectives are to promote shared responsibility and co-operative efforts in the international trade of certain hazardous chemicals and contribute to their environmentally sound use, by facilitating information exchange (Secretariat of the Rotterdam Convention[56]).

In 2005, Mexico ratified the Rotterdam Convention. The provisions of the Convention are legally binding. The Convention makes the implementation of the Prior Informed Consent procedure mandatory and defines the steps that Parties should follow for the movement of pesticides and industrial chemicals (United Nations Environment Programme, 1998[57]).

The main authorities responsible for the implementation of the Rotterdam Convention are COFEPRIS, SEMARNAT and SENASICA. The Secretary of Foreign Affairs is also involved.

In line with the provisions of the Rotterdam Convention, in 2008, Mexico notified to the Secretariat of the Convention national final regulatory actions prohibiting 16 pesticides not belonging to the Annex III of the Convention (chemicals subject to the prior informed consent procedure). All of these pesticides were restricted in Mexico in the 1990s, before it ratified the Rotterdam Convention. Mexico does not undertake risk evaluation in the decision-making process in restricting or prohibiting pesticides (Secretariat of the Rotterdam Convention, 2019[58]).

In line with the obligation in the article 10 of the Rotterdam Convention, as of March 2021, Mexico provided the Secretariat of the Rotterdam Convention with import responses for 30 pesticides or pesticide formulation, but did not transmit such response in relation to five pesticides. Mexico allows importing one pesticide regulated under the Rotterdam Convention without any conditions and 10 pesticides or pesticide formulations under specific conditions. The last import responses were provided in 2012 (Secretariat of the Rotterdam Convention, n.d.[59]).

The Stockholm Convention on Persistent Organic Pollutants (POPs)

The Stockholm Convention aims to protect human health and the environment from so-called Persistent Organic Pollutants (POPs) by, among others, prohibiting and eliminating intentionally released POPs, restricting their production and uses, as well as reducing and eliminating releases of unintentionally produced POPs (Secretariat of the Stockholm Convention[60]). In July 2020, the Convention covered over 30 chemicals or groups of chemicals, including 18 pesticides (Secretariat of the Stockholm Convention[61]).

Mexico ratified the Convention in 2003. SEMARNAT is responsible for the implementation of the Convention and the Secretary of Foreign Affairs is also involved. In 2007, SEMARNAT published the National Implementation Plan (NIP) of the Stockholm Convention (Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT), 2007[62]). As a result, the National Coordinating Committee was established with the objective of supervising the implementation of the Plan. This body includes the participation of representatives from the private sector, NGOs, academia and government and comprises eight working groups with its own action plan. The NIP was updated in 2016. It stated, among others, that there were still records for the use of two POP pesticides: pentachlorophenol and sulphuramide (PFOS, perfluorooctane sulfonate). It also noted that Mexico require further efforts to collect information from the

holders of small amounts of POPs pesticides as well as strengthening of pesticides management, in particular waste management and disposal (SEMARNAT, 2017[23]).

In addition, some of the POPs pesticides covered by the Stockholm Convention, namely chlordane and lindane (the latter is also covered by the Rotterdam Convention) had undetermined valid registrations in Mexico. This led the Mexican National Human Rights Commission to recommend the Mexican authorities to strictly comply with the multilateral agreements regarding toxic substances contained in pesticides and to prohibit or regulate their use in Mexico (NHRC, 2018[22]).

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

The objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes, by the reduction of hazardous waste generation, promotion of their environmentally sound management and restriction of their transboundary movements (Secretariat of the Basel Convention[63]). Mexico ratified the Basel Convention in 1991. SEMARNAT is responsible for the implementation of the Convention and the Secretary of Foreign Affairs is also involved

OECD Pesticides Programme

The OECD Pesticides Programme has three main objectives:

> *To help OECD governments share the work of pesticide registration and re-registration – the licensing of new products and re-licensing of old ones. This involves finding ways for governments to work together in assessing pesticide risks to human life and the environment.*
>
> *To harmonise the data and methods used to test and assess pesticide risks. Harmonisation not only helps governments work together but also ensures the quality of the data and the rigour of the assessments.*
>
> *To help OECD governments reduce the risks associated with pesticide use. In this case, the Programme focuses on the variety of things that governments can do to supplement pesticide registration and further reduce risks that may result even when registered pesticides are used properly (OECD[64]).*

To assist countries to co-operate in the review of pesticides, the OECD has created internationally agreed formats for the two main documents used in registering agricultural chemical pesticides: the “dossiers” of pesticide test data submitted by industry, and the “monographs” containing OECD governments’ evaluation of the test data. These agreed formats improve the quality and consistency of pesticide reviews. They also make it easier for OECD countries to work together and reduce the workload for industry by making it possible to submit similar data packages to different countries.

The OECD Test Guidelines is a set of internationally agreed testing methods used by government, industry and other stakeholders in identifying and characterising potential hazards of chemicals. The OECD Test Guidelines for the pesticide residue chemistry aim to assess pesticide exposure by identifying these residues in food or animal feedstuffs for purposes of dietary risk assessment and setting MRLs. They have been developed and based on guidelines in use in OECD countries and by the FAO (OECD, 2013[65]). The OECD has also developed an MRL calculator to harmonise pesticide MRLs across the OECD countries (see Chapter 2).

The OECD works to address several issues related to pesticide risk reduction, including better user compliance, container management and labelling, better training and education programmes, and reducing pesticide spray drift. Other risk reduction issues being addressed include protecting pollinators from the risks of pesticides and fighting illegal trade of pesticides. The OECD also deals with the issue of minor uses (i.e. a small-scale pesticide use for pest control in a low acreage crop or a small pest problem in a large acreage crop). More information and examples of the OECD work are referred to in Chapter 2.

COFEPRIS and SEMARNAT are designated as the main contact points for the OECD Pesticides Programme. However, the participation of Mexico was limited in the last years. In the light of ongoing reforms in Mexico in relation to its pesticides management scheme, the country might wish to consider which of the areas of the work undertaken by the OECD might correspond best to the Mexican efforts and might therefore benefit from an increased engagement from the Mexican stakeholders.

Better regulation tools to improve pesticide management

Better regulation in Mexico

In 2018, the government issued the General Law on Better Regulation (GLBR), which aims to strengthen the regulatory framework for improving the quality of the regulation. This General Law substituted the previous Federal Law on Better Regulation. The main objective of this law is to ensure the existing regulation is fit-for-purpose and the regulation to be issued brings more benefits than costs in the overall. The main elements in the GLBR include:

- *Ex ante* and *ex post* RIA
- Public consultation
- Annual Plan of Better regulation for all government agencies (national and subnational)
- National Registry of formalities and services and subnational registries of formalities and services
- The creation of the National Observatory of Better Regulation
- The creation of the National Council of Better Regulation

CONAMER is the oversight body in charge of providing the general guidelines for the implementation of the *ex ante* and *ex post* assessment of the regulation, as well as all the other better regulation tools. The CONAMER has to co-ordinate with all subnational better regulation authorities to ensure a sound and comprehensive regulatory framework.

Regulatory impact analysis process and the public consultation

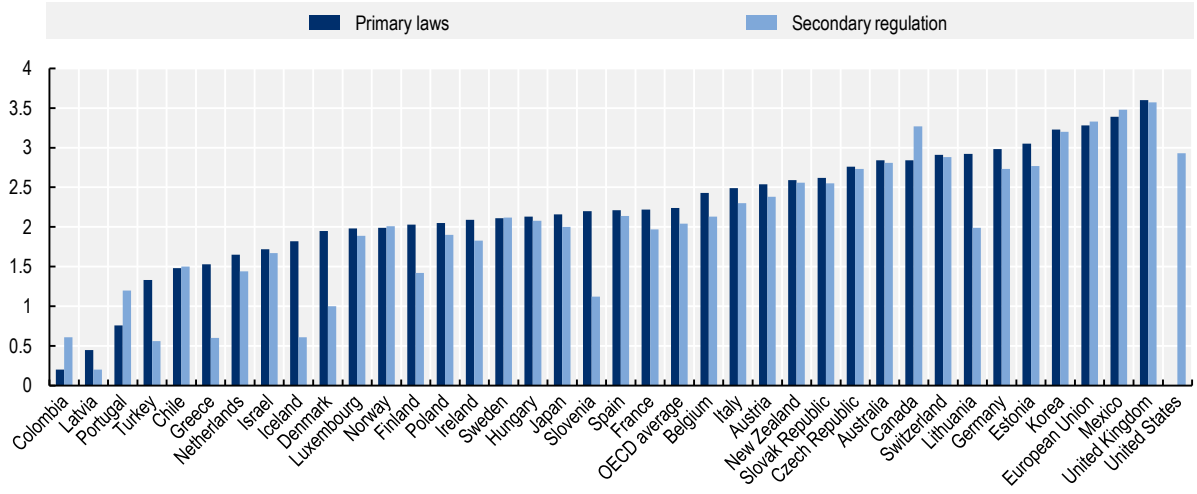
All the entities of the public administration belonging to the Executive branch have to present a RIA before issuing a regulation, seeking positive net-benefit for citizens.[5] Within the elements of the RIA, the government agency is required to have a public consultation with stakeholders.[6] At subnational level, each entity has to have an oversight body for the implementation of the RIA.

The OECD composite indicators on RIA include methodology, oversight, quality control, systematic adoption and transparency. As seen in Figure 1.7, Mexico has the second highest ranked RIA system, both for primary laws and secondary regulation, only after the United Kingdom.

At national level, CONAMER has different types of RIA, depending on the impact of the regulation to be issued. Each of the RIAs consider a specific type of impact, which could be an antitrust effect, a high-impact effect, medium-impact effect or even an emergency RIA. At national level, the CONAMER has guidelines for the *ex post* RIA since 2012. This tool applies only to NOMs that were classified as high-impact, medium-impact or those which have an impact on competitiveness during the RIA process. This process includes modification of pesticide regulation.

Since the PLAFEST was issued in 2004, it has been reformed only once, and the reform went through the RIA process. In 2011, COFEPRIS sent a RIA for approval to CONAMER (COFEMER at the time), to reform the PLAFEST to add the renewal process for pesticide registrations (CONAMER, n.d.[66]). This reform was finally published in 2014. Other changes in the pesticide regulatory framework have not generated compliance costs, and therefore CONAMER exempted regulators from conducting a RIA.

Figure 1.7. RIA composite indicators



Note: United States only has data available for secondary regulation.
Source: Indicators of Regulatory Policy and Governance Surveys 2014 and 2017, http://oe.cd/ireg.

However, there have been some important regulatory changes which have affected import of certain pesticides. They have been implemented through the modification of import tariffs, which fall into the category of Tax policy and therefore, according to the GLBR (and the former Federal Law of Administrative Procedure), are exempted from RIA. If a list of prohibitions or restrictions of the use, manufacture or import of pesticides were to be added to the PLAFEST, modifications to this list are likely to require a RIA. (Chapter 2 covers the prohibition of substances in detail).

The framework for public consultation, for all technical regulations, including pesticides, at national level in Mexico is well-designed and highly ranked among OECD countries. The LGMR describes the obligations on public consultation. The national government agencies of the executive power have to perform a public consultation with stakeholders before issuing a regulation,[7] through a web portal available to all public, in which the regulation is posted for at least 30 days. Agencies are obliged to respond to all comments submitted during the public consultation.

Ex post *assessment of regulation*

Ex post assessment of regulation allows government agencies to understand whether their regulations are indeed achieving their stated policy objectives. In Mexico, the GLBR mandates that each agency submits their regulations for an *ex post* assessment every five years (Art 77). Similar to the RIA, the *ex post* assessment has to include a 30-day public consultation.

Having this mandate for all regulations is a considerable effort, and the expectation is that only a low percentage of relevant regulations will be considered for *ex post* assessments. The GLBR also expanded the mandate; before this only NOMs were subjected to periodical revisions, now regulation in a broader sense is considered. Up to now, there haven't been any technical *ex post* assessments of pesticide regulations in Mexico. Box 1.3 below states the OECD recommendations to implement *ex post* assessment that can help Mexico's implementation efforts of this tool.

Box 1.3. OECD principles for *ex post* assessment

- Regulatory policy frameworks should explicitly incorporate *ex post* reviews as an integral and permanent part of the regulatory cycle
- A sound system for the *ex post* reviews of regulation would ensure comprehensive coverage of the regulatory stock over time, while "quality controlling" key reviews and monitoring the operations of the system as a whole.
- Reviews should include an evidence-based assessment of the actual outcomes from regulations, against their rationales and objectives; they should note any lessons and make recommendations to address any performance deficiencies.
- There need to be oversight and accountability systems within government administrations to provide ongoing assurance that significant areas of regulation will not be missed and that reviews are conducted appropriately.
- There are benefits in institutional arrangements that combine oversight of the processes for *ex ante* as well as *ex post* assessment, and that do so across the whole of government.
- The type of *ex post* review, and its timing or "triggers", are generally best determined at the time regulations are being made.
- Departments and agencies should provide advance notice of forthcoming reviews of regulation (ideally in the form of an annual "forward regulatory review plan").
- There should be explicit provision in agency budgets to cover the costs of reviewing the regulations for which they have responsibility.

Source: (OECD, 2020[67]).

The one-in-one-out rule

The one-in-one-out rule is a mechanism to control the stock of regulation. It consists of eliminating one regulation, whenever an agency is to issue a new one. This rule can work with different criteria, as one-in-one+-out, which means that agencies have to eliminate at least the equivalent number of new regulations issued.

In 2018, Mexico enforced a *compliance-cost-based* rule, for any entity of the federal administration that proposes to issue or modify regulations. That is, rather than trying to keep the regulatory inventory with a lower number of regulations, the rule is trying to reduce the compliance cost of the regulatory stock:

> *For the issuance of regulations, the Obliged Subjects must expressly indicate in their regulatory proposal, the regulations to be modified, abrogated or repealed, in order to reduce the cost of compliance by an amount equal to or greater than that of the new obligations of the Regulatory Proposal that is intended to be issued and that refers to the same subject or regulated sector. (Art 78, GLBR).*

This raises a number of practical challenges for Mexican regulators. The first, is that this rule is more complex to implement than the classical one-in-one-out that it usually focuses on burden (Trnka and Thuerer, 2019[68]). The real cost of compliance is hard to assess, since there are hidden, opportunity, and shadow costs, for instance. If regulators only take into account the explicit cost of a procedure, the fee for an application for example, they would be underestimating the real cost of the regulatory stock. It would imply a high effort to conduct a full measure of compliance costs every time a regulator is to issue a new one.

The second challenge arises from the fragmented nature of the management of the pesticide regulations. As discussed in this chapter, pesticide regulation in Mexico is managed by a large number of agencies. This means, that each agency has a small portion of the overall regulatory stock of pesticides, which reduces the room for manoeuvre if an agency is to issue a new regulation. Otherwise, agencies can co-ordinate with other regulators to simplify stock managed elsewhere, which raises co-ordination challenges. By streamlining the number of authorities involved in pesticides, this rule could bring further benefits.

Notes

[1] Constant 2010 USD.

[2] In broad terms, a general law establishes regulatory powers and provisions for the three orders of government in Mexico – federal, state and municipal levels. In contrast, a federal law only sets regulatory powers for the federal level.

[3] Which was abrogated in July 2020 and replaced with the new Law on Quality Infrastructure (http://www.diputados.gob.mx/LeyesBiblio/pdf/LICal_010720.pdf, last access on 5 May 2021)

[4] In November 2018, Canada, Mexico and the United States signed a new trade agreement, the Mexico-United States-Canada Agreement (called T-MEC in Mexico, CUSMA in Canada and USMCA in the United States). The name applied by Mexico will be used in this report. T-MEC entered into force on 1 July 2020.

[5] The other branches include the legislative and judicial powers. Additional elements could be considered to comprise the constitutional autonomous bodies, such as the Central Bank and the Telecom Regulator. Although the GLBR establish that some of its provision also apply to these additional elements, in terms of RIA they are not obliged to follow this process.

[6] There are exception to carry out both RIA and public consultation. The former when the agency demonstrates that there are no complying costs for the regulatee, and the latter when the consultation endangers the intended public policy objective of the regulation, amongst other cases. However, to be exempted from these processes, the agency must request clearance from CONAMER through a fully justified submission. CONAMER can deny the request if deemed appropriate.

[7] Except in cases in which CONAMER grants an exception, as discussed before.

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