



Mexico 2009 - Interdisciplinary Study Tour

Sustainable rural development in the light of globalisation

A study tour to Mexico
March 13th – March 28th 2009

Organised by:

German Institute for Tropical and Subtropical Agriculture -
DITSL GmbH Witzenhausen

Centre for International Rural Development
University of Kassel / Witzenhausen

Centre for Tropical and Subtropical Agriculture and Forestry
(CeTSAF), Georg-August-University Göttingen

Universidad Autonoma de Chapingo, Texcoco Mexico

Universidad Autonoma de Yucatan, Merida Mexico

CIMMYT Mexico

Naturland Asociación para Agricultura Orgánica

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Excursion programme

Day	Activity	Overnight location
13.03 (Fr)	Evening: Arrival in Mexico City from Madrid with IB 6403 18:00 local time, transfer and check-in to guesthouse Posada Santa Bertha, Texcoco	Posada Santa Bertha, Texcoco (75 km)
14.03 (Sa)	Morning: Mexico City, UNAM gate Iztapalapa: Tour of urban market, agriculture and dairy systems (summary 01) Afternoon:	Posada Santa Bertha, Texcoco (150 km)
15.03 (Su)	Morning: Texcoco: Universidad Autónoma Chapingo (UACH), meeting UACH resource persons, faculty staff and students, introduction to the programme; visit of library and laboratory facilities (summary 02) Afternoon: Mexico City: Visit to the Anthropological Museum in Mexico City, familiarisation with the agri-cultural heritage of Mexico: Aztec and Maya cultures (summary 03) Evening: "Virgen de Guadeloupe" (Catholic Centre of The Americas)	Posada Santa Bertha, Texcoco (150 km)
16.03 (Mo)	Whole day: Transfer to Oaxaca: Visit of a CIMMYT on farm research site (summary 04)	Oaxaca (guesthouse) (600 km)
17.03 (Tu)	Morning: From Oaxaca to Tuxtla Gutierrez (summary 05) Afternoon: Visit of an ecological coffee cooperative "FIECH - Federación Indígena Ecológica de Chiapas" with dry coffee processing „beneficio seco" (summary 06) , transfer to San Cristobal de las Casas	Hotel Margarita San Cristobal (650 km)
18.03 (We)	Whole day: San Cristobal de las Casas: Visit of the coffee museum "Café Museo Café" (summary 07) , visit of pine forests on the "Altos de Chiapas" (summary 08) & Mexican Synkretism in San Pedro de Chamula	Hotel Margarita San Cristobal (250 km)
19.03 (Th)	Whole day: From San Cristobal de las Casas to Palenque: Visit of an old Maya settlement site (summary 09)	Palenque (guesthouse) (200 km)
20.03 (Fr)	Whole day: From Palenque to Bonampak and back: Visit of Rainforest Systems (summary 10)	Palenque (guesthouse) (350 km)
21.03 (Sa)	Whole day: From Palenque to Merida. Check-In to Hotel, Excursion to Chichen Iza	Merida, Hotel El Castellano (550 km)

	and visit of the Kukulcan Equinox festival (summary 11)	
22.03 (Su)	Whole day: Merida: Visit of organic agricultural cooperatives Sabileros Mayas Ecológicos and Naranjeros Mayas Ecológicos (Agroforestry systems, Aloe vera and citrus production); Visit of the Mayan Juice Factory in Oxkutzcab (summary 12), transfer to Tzucacab Hobonil	Hobonil Guesthouse (200 km)
23.03 (Mo)	Morning: Tzucacab: Visit of the ranch Hobonil of the veterinary and zootechnical faculty of UADY. Livestock experimental facilities, visits of small agroforestry farm systems (summary 13) Afternoon: Visit to Uxmal (summary 14), transfer to Merida	Merida, Hotel El Castellano (200 km)
24.03 (Tu)	Morning: Visit of the Veterinary and Zootechnical Faculty of UADY (summary 15). Visit of an intensive pig raising unit, Visit of small and large scale livestock farms of different intensity, with beef production, sheep and swine farming and apiculture (summary 16), transfer to Veracruz	Villas Dali ? Veracruz (800 km)
25.03 (We)	Morning: Veracruz: visit of small and semilarge scale aquaculture operations, Veracruz Aquarium and El Colibri Farm (tilapia, crocodile, deer and pheasant) (summary 17) Afternoon: Visit the Cempoala Archeological site	Villas Dali ? Veracruz (200 km)
26.03 (Th)	Whole Day: From Veracruz via Puebla to Texcoco: Remnants of Mexican Colonial Agriculture, Crop Residue Management (summary 18)	Posada Santa Bertha, Texcoco (75 km)
27.03 (Fr)	Morning: El Batán: Visit to CIMMYT, Introduction to CIMMYT's research agenda (summary 19), visit to maize and wheat gene bank (summary 20)	Posada Santa Bertha, Texcoco (75 km)
28.03 (Sa)	Morning: Transfer to Mexico City Airport; Flight from Mexico City (IB 6400) at 11:55 via Madrid to Frankfurt	
29.03 (Su)	Noon: Arrival in Frankfurt	

(Total km travelled by bus: 5075, total overnight stays: 15)

summary 01 – summary 20 indicate programme points for written reporting by the participants (cf. below under “Reporting during the excursion”)

Reporting during the excursion

Each student was assigned the task of taking notes and writing a protocol / report for at least one of the places visited, accounting the personal impressions gained and the major points of discussion raised. The following section of this document contains these individual reports in chronological order.

No.	Date	Topic	Reporter	Page
1	14.03	Urban market, agriculture and dairy systems	Zschocke	
2	15.03	Universidad Autónoma Chapingo	Beckschäfer	
3	15.03	Anthropological Museum in Mexico City	Brand	
4	16.03	CIMMYT on farm research site at Oaxaca	Cruz Uribe	
5	17.03	From Oaxaca to San Christobal de las Casas	Gonzalez Monge	
6	17.03	Ecological coffe cooperative FIECH	Hagmann	
7	18.03	Coffee Museum San Cristobal	Hohls	
8	18.03	Pine forests on the "Altos de Chiapas"	Honsdorf	
9	19.03	The Maya settlement of Palenque	Klaiss	
10	20.03	Rainforest systems of Bonampak	Khathir	
11	21.03	Chichen Iza and the equinox festival	Leupolt	
12	22.03	Organic agricultural cooperatives Sabileros Mayas	Pannwitt	
13	23.03	Hobonil Ranch	Plagemann	
14	23.03	Uxmal	Rakow	
15	24.03	Veterinary and Zootechnical Faculty of UADY Merida	Reckling	
16	24.03	Livestock systems of Yucatan	Rivera Aedo	
17	25.03	Aquaculture in Veracruz	Roberts	
18	26.03	Mexican Colonial Agriculture from Veracruz to Puebla	Stout	
19	27.03	CIMMYT Centre El Batan and Research Agenda	Tigges	
20	27.03	CIMMYT Gene Bank in El Batan	Araujo Enciso	

Schedule of the preparatory seminar / presentations

Thirteen student presentations on political, social, economic, bio-physical, agronomic and ecological aspects of Mexico along the thread of the country's history were held during the preparatory seminar. Each topic had 20 - 30 min. presentation plus 10 min. discussion. The presentation schedule is given below.

No.	Title	Presenter
Wednesday, Oct. 22nd 2008, 17:30 - 20:00 / Seminar room S1, Steinstrasse 19, WITZENHAUSEN		
	Introduction to programme and host country Mexico, assignment of seminar topics, Schedule of further meetings, Credits	Hülsebusch, Bürkert, Schlecht, Dohrenbusch
Saturday, Nov. 29th 2008, 10:00 - 14:00 & Lecture Hall 06, Albrecht Thaer Weg 3, GOETTINGEN		
01	Physical geography, climate zoning, vegetation zones and agro-ecosystems (page 7)	Nora Honsdorf Charlotte Hohls
02	Forestry in Mexico & certification of forest enterprises (page 11)	Miriam Guth
03	Timber market and Non timber forest products (NTFP) in Mexico (page 17)	Hendrik Brand
04	The Mexican livestock sector (page 23)	Rita Khathir
Saturday, Dec. 6th 2008, 10:00 - 14:00 / Seminar room S1, Steinstrasse 19, WITZENHAUSEN		
05	The Aztecs and the Mayas – two contrasting powers in Mesoamerica (n/a)	Sandra Gonzalez Monge Edinson Rivera Aedo
06	From political independence to the revolution with Emilio Zapata & Benito Juarez (page 28)	Matthias Klaiss Verena Tigges
07	Political economy of Mexico (government and economics: from PRI to PAN, from 'maquiladoras' to NAFTA) (page 36)	Sergio Rene Araujo Enciso Fabian Cruz Uribe
Saturday, Jan. 24th 2009, 10:00 - 14:00 / Lecture Hall 06, Albrecht Thaer Weg 3, GOETTINGEN		
08	The first post-modern revolution – the insurrection of the 'Zapatistas' in Chiapas (page 41)	Daniel Stout
09	Catholicism in Mexico: From 'La Virgen de Guadalupe' to Liberation Theology (page 46)	Nina Rakow Alison Roberts
10	'Plan Puebla' and other efforts to modernize agriculture (page 52)	Arnd Zschocke
11	The 'Ejido' system and the perpetual question of land property rights (page 57)	Julian Plagemann Heike Pannwitt
Saturday, Jan. 31st 2009, 10:00 - 14:00 / Seminar room S1, Steinstrasse 19, WITZENHAUSEN		
12	The massacre of Tlateloloco, the 1968 movement, UNAM and the political 'murallismo' (page 59)	Sabrina Leupolt
13	The 'Chinampas' of the valley of Mexico (page 62)	Jonas Hagmann
14	Organic agriculture in Mexico (page 75)	Moritz Reckling
	Organisational matters	Hülsebusch, Bürkert, Schlecht, Dohrenbusch

Physical geography, climate zoning, vegetation zones and agro-ecosystems

Nora Honsdorf & Charlotte Hohls

Physical Geography

Mexico is part of the Americas, situated between 32° and 14° of northern latitude. Its east-west extension reaches from 17° 19' at Tijuana in Baja California to 86° 46' of western longitude at the peninsula of Yucatan. The total area of the Mexican state covers 1,972,550 square kilometers of which approximately 6000 square kilometers are islands in the Pacific Ocean, Gulf of Mexico, Caribbean Sea, and Gulf of California. Mexico shares borders with three countries, the United States of America, Guatemala and Belize.

Eighty percent of Mexico's landmass belongs to the continent of North America. The Isthmus of Tehuantepec is scenically the border region between North and Central America. Mexico's landscapes can roughly be divided in four parts, the mountain ranges (Sierras), the table land (Altiplanis or Mesetas), coastal plains and the intramontane basin of Rio-Balsas. This will be described in more detail in the following. Northern and Central Mexico is defined by two prominent mountain ranges, the Sierra Madre Oriental and the Sierra Madre Occidental, and the altiplano (high plane) that lies between those mountain ranges. The altiplano stretches from the United States border in the north to the Cordillera Neovolcánica in the south. The Mexican altiplano is divided into a northern and a southern section by a low east-west range between Monterrey and Torreón. The northern part of the high plane, Mesa del Norte, has an average elevation of 1,100 m. This region is characterized by aridity. The southern part of the high plane, Mesa Central, is higher than its northern counterpart, it averages 2000 m in elevation. Within the altiplano lie numerous valleys in which Mexico's most important cities are located. In a more narrow sense the Mesa Central is the semiarid to semi-humid region of the central Mexican region between approximately the 22° latitude and the depression of Rio Balsas. As Meseta Neovolcánica, the transmexican vulcano range, the Cordillera Neovolcánica belongs to the Mesa Central. This is where Mexico City is situated. The range runs from the Pacific Ocean to the Gulf of Mexico, has a length of 900 kilometers and a width of 130 kilometers. From the volcanic high plane with altitudes between 1800 and 2300 m, arise volcanoes of more the 5000 m altitude, for example the famous Popocatépetl and Iz-taccíhiatl near Mexico City. With 5,747 m Pico de Orizaba is the highest mountain of Mexico. The Cordillera Neovolcánica is regarded as the geological dividing line between North and Central America.

There are several important mountain ranges in Mexico. As mentioned above the Sierra Madre Oriental and Occidental border the Mexican altiplano. The Sierra Madre Occidental begins approximately 50 kilometers from the US-border and runs 1,250 kilometers southwards where it merges with the Cordillera Neovolcánica. At the northern end the Sierra Madre Occidental lies about 300 kilometers inland from the west coast but approaches to within 50 kilometers at the southern end. The range averages 2,250 m in elevation with peaks up to 3000 m. The Sierra Madre Oriental starts at the Texas-Mexico border and stretches 1350 kilometers southwards until reaching the eastern part of the Cordillera Neovolcánica. It has approximately the same altitudes as the Sierra Madre Occidental has. In southern Mexico there are two more mountain ranges, the Sierra Madre del Sur and the Sierra Madre de Chiapas. The first one which can be divided in a coastal mountain range and the mountain range of Oaxaca reaches altitudes of up to 3700 m. The Isthmus of Tehuantepec separates the Sierra Madre del Sur from the Sierra Madre de Chiapas. The latter one reaches altitudes

of about 3000 m. The Mesa Central of Chiapas has average altitudes between 2000 and 2500 m. One other significant mountain range is on the peninsula of Baja California (Lower California). It has a length of 1,430 kilometers. Peaks measure between 250 and 2,200 m. At the bottom of Sierra Madre Occidental and Oriental coastal lowlands can be found. The lowlands of the Gulf Coast stretch up to the peninsula of Yucatan.

Yucatán is the peninsula in the very southeast of Mexico, which is composed of a plate of karstified limestone. It has a length of 450 kilometers and a width of 350 kilometers. The peninsula separates the Gulf of Mexico from the Caribbean Sea. With 300 m altitude the Sierrita is the highest point on the peninsula. In Yucatan there is no above ground drainage, all drainage takes place in underground rivers in the karstified limestone. Through Cenotes, which are some type of doline, the water is accessible.

Climate

Mexico does not have thermic seasons but hygric seasons with a change between rainy season and dry season. Moreover Mexico has parts in tropical and subtropical climate zones.

South and Central Mexico belong to the tropical climate zone. Tropical Mexico is characterized by a diurnal climate. This means that variation in temperature is greater between day and night than the variation within the whole year. The variation in course of one year increases from South with 5 °C to up to 20 °C in the North of the country. A variation within year of 10 – 12 °C is the limit in the thermic definition of the tropics. This is reached in the region around tropic of Cancer, which is the range in defining tropics by insolation.

Northern Mexico belongs to the subtropics because it lies north of tropic of Cancer and temperature variation is greater within one year than within one day.

The annual rhythm is determined by rainy season and dry season. Mexico has its rainy season in the summer months. Usually the winters are dry. An exception is the peninsula Baja California, which has its rainy season in winter. Moreover there are some regions in the South that do not have a dry season at all.

Mexico has part in all hygric climate zones of the tropics, from very humid in the southeast with 12 humid months to arid with less than two humid months in the desert and semi-desert climate in northern Mexico. Most parts of the country are semihumid to semiarid. Table 2 shows distribution of the different zones. Definitions of the different zones are as follows:

- Humid: 11 – 12 humid months, everhumid tropical wet climate
- Subhumid: 9 – 10 humid months, tropical wet climate, short interruption of rainy season
- Semihumid: 7 – 8 humid months, wet climate with longer interruption of rainy season
- Semiarid: 4 – 6 humid months, dry climate with short rainy season
- Subarid: 2 – 4 humid months, dry climate with very short rainy season
- Arid: 0 – 2 humid months, semi-desert and desert climate

Thermic climate levels: Due to the great differences in altitude that exist in Mexico, the country has part in all thermic levels of the tropics. The lower parts of the country belong to the warm tropics (tierra caliente: hot land and tierra semicaliente: warm land) with mean annual temperatures within 25 and 19 °C. At the 19 °C isothermal line starts the temperate level (tierra templada) which is the transition zone between warm and cold tropics and represents the average frost line. It is found in altitudes between 1300 and 1800 m. It has mean temperatures between 19 and 15 °C. The cold tropics (tierra fresco, tierra fría) have average temperatures between 9 and 15°C and start in altitudes between 2000 and 2400 m

above sea level. In 3200 m begins the tierra helada with average temperatures between 9 and 5 °C which is followed up by the tierra subnevada with temperatures between 5 – 1°C in 4000 m altitude and the tierra nevada 4800 m altitude which represents the snowline.



Figure 1: Climate zones of Mexico

Vegetation Zones

The mentioned border between cold and warm tropics is the most important height border concerning agro ecosystems and vegetation zones. (Sommerhoff 1999). The common classification of vegetation zones is based upon climax vegetation due to climate, varying in hygric and thermal condition (Schröder 1998). The horizontal distribution of vegetation zones depends on height of precipitation and the duration of wet respectively dry season. The vertical distribution is characterized by temperature height steps. A systematic is provided by Lauer/Frankenber 1987 in Sommerhoff 1999.

Floral realms are another concept of classifying the earth's vegetation (Schröder 1998). In Mexico, two floral realms are toothed into one another which is another specialty of the country's vegetation. Holarctic plant genera (e.g. pinus, quercus, picea, juniperus) dominate the highlands and the mountains as neotropical plant genera (yucca, psidium) are widespread in the lowlands. This feature of Mexico's flora is made possible by the bridge position between North and South America and the meridian direction of the Cordilleras: no massif stood in the way of plant migration, so the holarctic genera migrated southwards along the mountains- probably during the cold periods of Pleistocene (Sommerhoff 1999).

The multiple variations of plant formation are categorized into eight vegetation units (Sommerhoff 1999) which cover vegetation zones of the tropics following hygric criteria.

Agro-Ecosystems

Some general remarks about Mexican agro-ecosystems can be made. Mountain areas are endangered by erosion and are, in most cases, only suitable for extensive subsistence agriculture. Arid zones have potential for irrigated agriculture- reserve areas. The yields there are even higher than in humid zones, where soil condition is the minimum factor. Semi humid areas of central Mexico are ecologically favoured for agriculture (Sommerhoff 1999).

An agroecological system can be defined by the following elements (Rickerl, Francis 2004):

- Physiochemical factors – soils, climate, moisture, radiation, day length;
- Biological elements – crops, animals, pests
- Changing and appropriate technologies available to the farmer
- Sociocultural background . education, policy, experience
- Economic viability – market, costs, management
- Ecological soundness – preservation of biodiversity and ecosystem functions

Heterogenic possession structure is followed up by different systems of land use- and has its roots in history. Three historical categories of Mexican agriculture have shaped today's agro-ecosystems:

Indians had diverse subsistancial systems with low mechanisation. The systems were characterized by handwork- there was no ploughing known. They did not have no livestock except for turkeys and hairless dogs, crops were maize, beans, avocado, tomato, chilli, agave, to-bacco, cocoa, vanilla, pineapple, papaya, guava, sapodilla and rubber tree. The land was common land and identification point for the community. They fit their strategies to the envi-ronment, not the other way around. Fruit rotations included mixed culture, often with pumpkin, maize, beans. Up until twelve species were planted per hectare.

No livestock waste was used. In the tropical areas people practiced a complex integration between agriculture, horticulture, cropping in the secondary wood and collection economy in the primeval forest. Another agro-ecosystem were the chinampas; another the "Mipa" or "Roza"- system, a field-forest-alternating system still practised today. It has been discussed that the destruction of Indian agro ecosystems in the 16th century and only the marginal and extensive systems could survive.

Sources

Rickerl and Francis(2004): Multidimensional thinking: a prerequisite to agroecology. In D. Rickerl and C. Francis, (ed.) Agroecosystems Analysis. American Society of Agronomy, Madison, WI.

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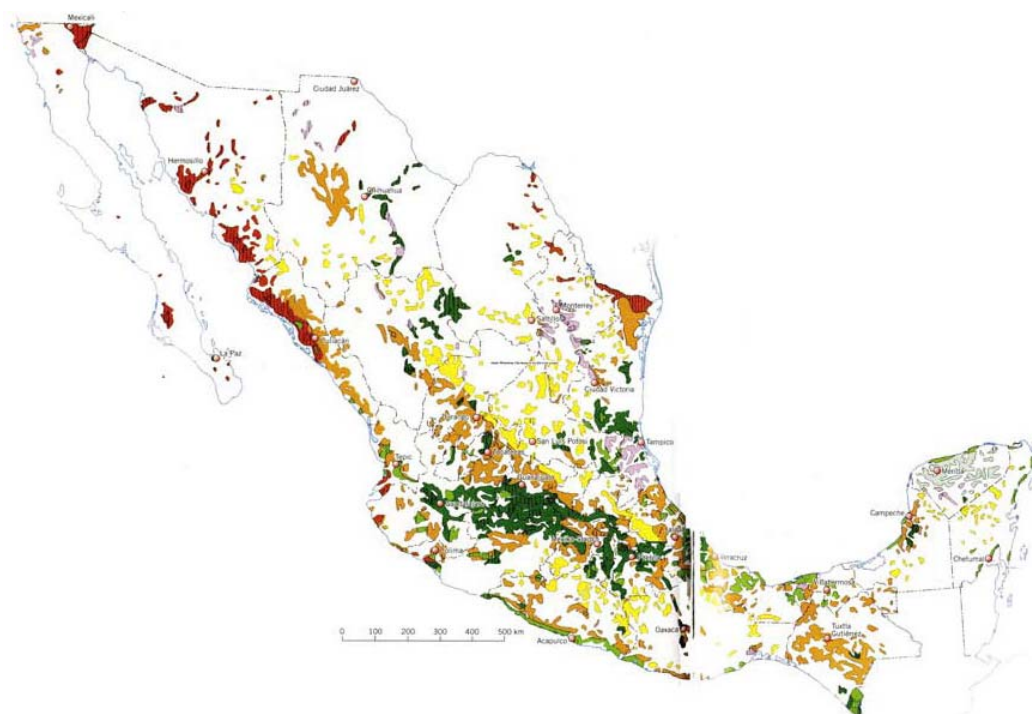
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Further reading:

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Cropping system	Main Products	Market orientation	Productivity and development standard ¹
 irrigated/horticulture	cereals: wheat, millet, beans, vegetables, tomatoes, beans, chili	export, domestic market	high
 specialized cropping (monoculture)	maize, millet, beans	domestic market	medium to high
 diversified cropping	maize, millet, beans, chili, salad, curliflower, alfalfa	domestic market	medium to high
 extensive cropping	staple foods: maize and beans	subsistence and local markets	low
 fruit culture	zona semicalida and templada: oranges, lime, grapefruit, tangerines. zona templada and semifria: apricots, pears, avocado, apples.	export, domestic market	medium to high
 tropical culture	papaya, mango, banana, coconut, pineapple, cocoa, coffee, tobacco, sugar cane	export, domestic market	medium to high
 fibre	henequén (agave)	domestic market and subsistence	medium to low
 irrigated cropping	irrigated cropping	?	?
 cut-and-burn cropping	forestry in the sierras, livestock breeding in the arid north, badlands		

Figure 2: Geographical distribution of agricultural production in Mexico with stress on market relevant products (Source: Atlas Nacional de México 1992 in Sommerhoff 1999)

¹ Criteria: degree of mechanisation, use of fertilizer and pesticides, improved seed, employment of capital

Forestry in Mexico and Certification of Forest Enterprises

Miriam Guth

Introduction

Mexico is rich in temperate and tropical forests. It possesses about 1.3 % of the world's total forest resource. One quarter of Mexico's total land area is classified as forest land. It is especially rich in pines. There are 72 species of pine which is about 50% of all known pine species. Conifers predominate in higher elevations of Mexico. Stands of oak, copal, and pine grow from 1000 to 1500 m. Palms are found in elevations up to 500 m, while mahogany, cedar, primavera, and sapote are found from 500 to 1000 m.

Temperate forests, tropical forests and other areas with natural vegetation make about 141.7 million ha which is 72% of the national territory.

About 30.4 mio ha are temperate forest in Mexico and about 26.4 mio ha are tropical and subtropical forest, mainly found in the south and southeast. The annual deforestation consists of 508 000 hectares according to FAO calculations.

Table 1: Woodland in Mexico:

Ecosystem	Area (million ha)	% National territory
Temperate forest	30.4	15.5
Rainforest	26.4	13.4
Arid zone vegetation	58.5	29.7
Wetland and saltmarsh vegetation	4.2	2.1
Disturbed woodland	22.2	11.3
Total woodland	141.7	72

Source: <http://www.fao.org/docrep/meeting/x4702e.htm>

It has to be considered that there are different definitions for forest, so that there are also different informations about how big the forest area in Mexico is. Here is the definition for forest as given by the FAO, whose data was used:

„Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.“

Forestry Production

About 90% of Mexico's forestry production comes from temperate forests, the main part of whose are found in the states of Chihuahua, Durango, Jalisco, Michoacán, Oaxaca, Chiapas, and Guerrero. Tropical forests account for only 10% of forestry production, and exist in the states of Chiapas, Quintana Roo, Yucatan, Campeche, Tabasco, and Oaxaca.

Mexico's forestry policy is designed to protect and renew these resources, so that forests may fulfill their soil-protection functions and timber reserves may be exploited rationally and productively. Only about 30% of all forests are exploited, mostly in Chihuahua, Durango, and Michoacán. Mexico's ability to supply its own wood products needs are severely restricted by

the limited timber available. Roundwood production in 2000 was estimated at 45.7 million m³ by the FAO; forestry imports exceeded exports by US\$2.46 billion.

There are also many other useful products found in Mexico's forests other than wood. Annual forestry production also includes an estimated 100,000 tons of resins, fibers, oils, waxes, and gums. The indigenous peoples living in Mexico's rain forests are estimated to utilize up to 1,500 species of tropical plants to manufacture 3,000 different products such as medicines, construction and domestic materials, dyes, and poisons.

Forest Ownership

The ownership is divided as follows: 80% communal forests, 15% private forests and 5% state forests. Communal forest are either comunidades or ejidos. Communal forests are the indigenas which have had this form of forest management already in the prehispanic era. Whereas the ejidos were founded in 1917 as a common property regime by Article 27 of the Mexican Constitution in response to the strong presence of agrarian reformists in the Mexican Revolution. Before the Revolution 1% of the population held about 97% of the land.

Important species in wood production

The most important species is pine (*Pinus* spp). With 7.5 mio m³/year it makes almost 80% of the felling. It is followed by oak (*Quercus* spp.) and other temperate broad-leaved species. Only about 5% is tropical wood e.g. mahogany (*Swietenia macrophylla*).

Most of the softwood production is used in domestic construction, mainly concrete forming. Other important uses of softwood are for finishing work such as parquet flooring and manufactured door, windows and furniture. The main part of the hardwood consumed in Mexico goes to the furniture manufacturing industry. However the contribution to the nation's Gross Domestic Product (GDP) is hardly 0.6%.

Because the GDP is so low the government has not put much money into the development of the forest management and therefor the infrastructure is not very developed and it is hard to get access to the forests. The transportation cost is unusually high in the forestry sector, partly because of the low road density which is only 8 m per hectare – that accounts for only one third of the density recommended by the FAO. As a consequence wood production costs are 35-40 percent higher than the world average.

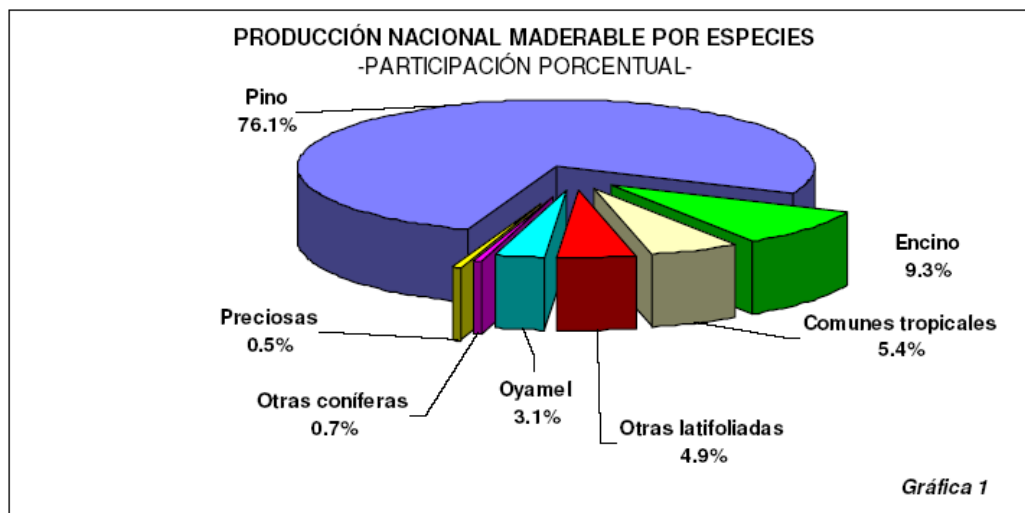
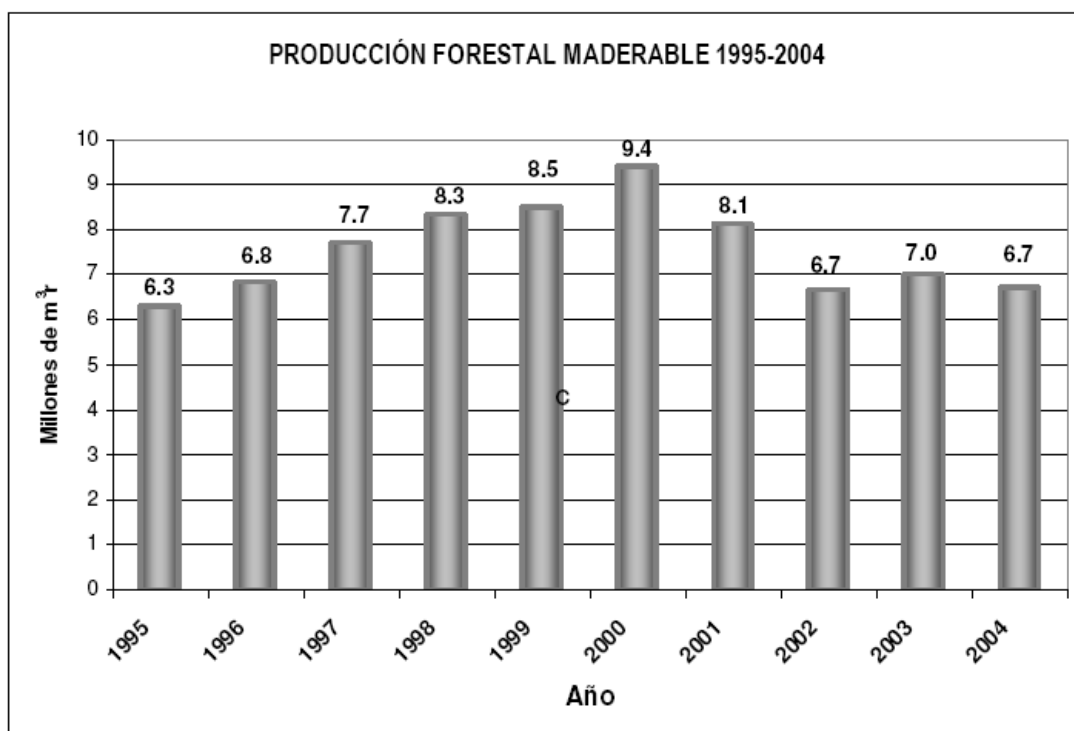


Table 2: National wood production for species (Source: <http://www.semarnat.gob.mx/gestionambiental/forestalysuelos/Anuarios/Anuario2004.pdf>)

The graphic shows the percentage of the different species that were used in wood production in 2004 as reported by the Secretaría de Medio Ambiente (SEMARNAT) – the Mexican Ministry of the Environment and Natural Resources. The pine has a part of 76.1%, the ilex of 9.3% and tropical wood of 5.4%. The sacred fir (*Abies religiosa*) with 3.1% is also one of the more important species. It is a fir species that is native to the central mountain ranges and the south of Mexico. The rest is made up by other broad-leaved species (4.9%), other conifers (0.7%) and precious wood (0.5%).



Fuente: Dirección General de Gestión Forestal y de Suelos con datos obtenidos de las Delegaciones Estatales.

Table 3: Development of wood production in Mexico (1995-2004) (Source: <http://www.semarnat.gob.mx/gestionambiental/forestalysuelos/Anuarios/Anuario2004.pdf>)

States producing the highest amount are Durango (28.6%), Chihuahua (18.5%), Michoacán (9.4%), Oaxaca (7.5%) y Jalisco (6.0%) which accounts for 69.9% of the total production, which equals 4.7 mio m³.

The species that were mainly used during 2004 were Pine with 5.1 million m³ (76.1%), ilex with 0.6 million m³, the other 1.0 million m³ (14.7%) correspond to other species.

Changes to develop forest industry

In recent years the government has chosen to develop the forest sector under the guidelines of sustainable forest management. The Mexican Constitution was amended and a new Agrarian Law enacted in 1991, which allowed the ejidatarios to lease or sell their land to individuals or corporation, with the approval of the group.

The land reforms also extended the length of time a concession may be granted: before the reforms concessions were limited to one year periods, which did little to encourage long-term investments in infrastructure. The government's intent is to demonstrate to national and international investors the Mexico's forests represent a good investment.

Despite these policy changes, investors have been slow to invest in Mexican forestry. According to several studies, Mexico offers much potential for forest production, particularly in temperate forests. However, achieving this potential will require further policy changes in the forest sector.

Why certification?

Forest certification came up through the concern over rapid tropical deforestation in the 1980s and 1990s. Approximately 17 million hectares of tropical forests were cleared in 1990, at a rate of more than an acre per second. Efforts to maintain biodiversity and environmental quality through improved forest management had emerged as an important part of an overall strategy. First the certification was meant only for tropical forests but today it is also used for temperate and boreal forests

Certification in Mexico

Certification for forest use that is favourable to the community in terms of ecology, sociology and economy. Since 1994 the Forest Stewardship Council (FSC) is being used in Mexico. 772,166 ha were reported certified in Mexico in 2007. About 13% of the cultivated forests have certification in Mexico. States with highest amount of certified forests: Durango, Chihuahua and Oaxaca. 94 % of the certified forests are found in community forestry. In 2004 there were 36 FSC-certified operations covering 613,671 hectares in Mexico. Certified forests make up 44% of the total number of certified community sites and half of the certified forest surface area worldwide (Alatorre, 2003). Positive changes that have come through certification are improved forest management, recognition of silviculture developed by forest communities and cooperatives and access for those groups to national- and state-level resources that promote sustainable forestry and adaptive management. But there are also some negative aspects to it like the failure to address some important issues such as illegal logging.



Figure 2. Mexican states containing FSC-certified forestry operations
Source: Alatorre 2003

Table 4: Mexican states with certified forest management

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Timber Market and Non Timber Forest Products Mexico

Hendrik Brand

Mexico is a country with many different vegetation types, there is a dry area with deserts, mountainous areas with temperate climate conditions and tropical rainforest with humid circumstances. This leads to a great variety on forest products.

In Mexico most of the forest is found in the temperate and the tropical humid zone. The total area of land is 1.972.550 km², with a population of 109.955.400; the population density is 55 people per km².

Mexico is called an upper middle income country, the Gross Domestic Product is \$1.486 in total, per capita it is \$14,119, Mexico is on the 54th place in the list of countries by GDP, and only 4% of the GDP is in agriculture. 29% of the total area is covered with forest and woodland, other land use systems are permanent pasture with a share of 41,9%, permanent crops 1,3%, arable land 13% and other land types with 16% of the total area. The annual deforestation rate is -1,1% the estimation for 2020 is that the area of forest and woodland will decrease with 6 % to 23% of the total area. That means that the estimated loss of forests will be around 20% which is a great number, there are already plantation incentive programs for cooperative and private landowners.

About 80% of the forest in Mexico is registered as ejido common land or indigenous communal property, for this management system, communities can organize this as community forestry enterprise (CFE), this is the use of the forest for the sources of food, fuel, fodder, medicines and building materials, around 500 communities and common land is organised like that. In the last few decades the changing international policies had a big influence on the CFE especially by the NAFTA agreement.

The import of forest products in Mexico in 2006 was \$4.355.797 and the export \$339.537.000 in compare with Germany that had an import of \$16.197.138.000 and an export of \$19.047.849.

Timber market

The importance of Mexico for the timber trade on the world market is not high, just 0,1% share of the world export and 0,7% of the world import. This means that Mexico is not a big player on the world timber market. Important is also a decreasing of the production and a increasing of the consumption in the last 20 years.

Round wood is wood harvested from forests or outside, it is with or without bark. The wood is roughly shaped direct after harvesting or there is already a small working process done, like it can be split or roughly shaped in other forms, it includes wood for charcoal, saw logs and veneer logs, pulpwood and other industrial round wood

The round wood production for Mexico in 2006 was 44.714.000 m³ and the consumption 44.874.000 m³, the import was 176 m³ and the export 16.000 m³, in compare to Germany the import and export are quite low, the import of Germany in 2006 was 3.452.000 m³ and the export 6.738.000 m³.

Sawn wood is produced from round wood, either by sawing lengthways or by a profile-chipping process, lumber is a form of sawn wood, wooden floors are excluded.

The production in Mexico of sawn wood in 2006 was 2.829.000m³ with a consumption of 6.958.000m³; the import was 4.193.000m³ and the export 64.000m³, in compare to

Germany in 2006 with a production 24.420.000m³ and a consumption of 21.184.000m³, import with 4.824.000m³ and an export of 8.057.000m³.

The recovered paper production of Mexico in 2006 was 4.302.000m³ and the consumption was 6.005.000m³, the import was 1.991.000m³ and the export was 288.000m³, in compare to other South American countries Mexico is the biggest producer, for example Brazil produced in 2006 3.497.000m³ and consumed 3.508.000m³, imported 13.000m³ and exported 2000m³.

Important tree species in Mexico

Tropical area:

Alnus jorullensis (warm temperate areas); the wood is used for construction, crates, household appliances, broomsticks, music instruments.

Cedrela odorata; the wood is used to build canoes, sport boats, cigar boxes, furniture, interior/exterior works and music instruments.

Ceiba pentandra; is used for construction wood, packaging material, furniture paper.

Cordia alliodora; wood is used for shipbuilding, bridges, furniture, veneers.

Leucaena leucocephala; used for firewood, paper, poles, masts, furniture and frames.

Swietenia macrophylla (mahogany); this is one of the finest wood of the world, used for (artistic) carpentry, inlays and carving.

Temperate area:

Cupressus lusitanica; the uses are for construction wood, paper and plywood.

Pinus oocarpa; is used as saw log for constructions, interior/exterior works, paper and poles.

Pinus patula; the wood is used for carpenter products, paper and packaging materials.

Prosopis juliflora (dry area); the uses are firewood, wood for charcoal, cartwheels, carpenter works, door/window frames and sleepers.

Non Timber Forest Products (NTFPs) in Mexico

Non Timber Forest Products (NTFPs) are plant or plant parts as well as animal products collected from natural forests that have an economic value. This excludes timber, natural gas, oil, sand, stones that are covered under other sections. The products that are collected in forest ecosystems are mainly used in the household. They have cultural, religious and social purpose. The products are commercialised on the local, national or international market. NTFP are also further processed; oriented to the consumer market.

NTFPs are classified into edibles on non edibles. Edibles include edible plant, animal, honey, oils, meat (fish), exudates, spices etc. Non edibles include ornamental plants, fibre (weaving, basketing), medicinal products, exudates, oil for cosmetics, wood, handicrafts. Another identification is Non Wood Forest Products; this excludes all materials made from wood, such as fire wood and handicrafts, the NWFP mainly have a greater commercial value or coming from cultivation.

A more specific classification is divided in four categories

Edibles

Mushrooms are the most well known forest products; mainly they are important for the local market, as well as fruits, nuts, herbs and spices. Products with storage ability like some mushroom species, (dried) fruits, nuts, herbs and spices, honey and teas are also coming on the international market.

Medical/dietary supplements

This can include medicinal mushrooms, bark, roots, leaves, twigs. These products are used whole as natural medicines, or processed to concentrates for other medicinal properties.

Floral products

These products may appear in floral arrangement, like dried flowers, cutting greens, decorations made of moss, ferns, flowers, twigs and (pine) cones

Speciality wood products

Product made out of wood, directly from tree not from timber for lumber products; that means a tree may not need to be cut down to produce these items. It includes handicrafts, carvings, music instruments, containers (baskets) and special furniture pieces (2007, Adepoju, A. A. and Salua, A. Sheu; Economic Valuation Of Non-Timber Forest Products (NTFPs), MPRA Paper No. 2689, http://mpra.ub.uni-muenchen.de/2689/1/MPRA_paper_2689.pdf).

The use of NTFPs has an influence on the forest. The intensity is the main factor, important is also how it is collected, this can be divided into non destructive and destructive. Non destructive means, there is not a big influence on the individual plant or area, this includes leaves, fruits, bark (ability to recover), seeds, flower, or exudates. Destructive collecting methods influence the whole plant or area mainly without recovering, this could be trunks, roots, tubers or the entire plant. Meat or fish collected from the forest could be also classified as destructive.

In Mexico there is a great variety on NTFPs, there are many different ecosystems due to areas with different climate conditions. Especially the tropical humid area has many useful products collected from the rainforests. There are approximately 1500 different useful species, $\frac{1}{3}$ of the products are found in primary forest, $\frac{2}{3}$ are found in the secondary forest. The 1500 species that are useful gives nearly 3000 products, 33% of these products are for medical uses, 16,5% is edible, 15 % are woods and wood products (whole tree; destructive), that includes timber and fibres, 36 % is fuel woods, drugs, ornamentals (seeds), forage, resins, dyes, gums,, tannins, flavourings, sweeteners and (work) tools.

In Mexico most of the NTFPs are important for home consumption and the local market; it is also one of the few cash generating opportunities for women. In Mexico the ejido common land is important for the supply of NTFPs. For most of the communities the NTFPs provide a basic level of income, it doesn't give the communities much socio economic advance.

In Mexico NTFPs are basic incomes for indigenous groups especially in the southern states, as the indigenous groups mainly belonging to the poorest section of the society. Most of the products are important for the households and the micro regional and domestic market. A few NTFPs are also exported to Europe, North America and other Asian countries. The products for the international market are traded throughout Mexican wholesalers and companies, cooperatives (within communities) or NGO's. Dependent on the product there will be a processing done, if there is not a high level of processing needed.

Important NTFPs in Mexico

Resin

Mexico is a major producer of Resin in 1994 there was a production of 36.731 tons part of this production is coming from plantations which estimated about 259.000 ha. Resin is collected from *Pinus* species and has a high value in the state Oaxaca. There are many pine species that are used for resin production, but the production is principally done by the species *Pinus montezumae*, *P. michoacana*, *P. leiophylla*, *P. pseudostrobus*, *P. teocote*, *P. oocarpa* and *P. hartwegii*. Most of the pine forest is found in the northern part of the country but the main production is coming from southern parts due to a higher yield of resin for trees in warmer conditions. From the raw resin gum rosin and turpentine are derived. Gum rosin is used as an ingredient for printing inks, varnishes, glues, soap, paper sizing, soda, soldering fluxes and sealing wax, it is also known as a food additive E195 and a derived glycerol ester E445. Turpentine is used as a source of raw materials in the synthesis of fragrant chemical compounds like camphor, linalool, alpha-terpineol and geranol, it is also added to many cleaning and sanitary due to antiseptic properties.

Chicle

Manilkara zapota called sapodilla is in the tropics worldwide cultivated for the fruits, there are many cultivars, the fruit is also collected from wild trees but this is just important for own use. Chicle is latex tapped from Manilkara zapota a tree native to rainforest in southern Mexico and certain parts of Central America. Chicle was used in chewing gum in the past, since the use of cheaper synthetic gums it lost its importance in the chewing gum industry. Nowadays chicle is occasionally used in Japan, Italy, Korea and the USA. Chicle production fluctuates every year in amounts. In 1990 the production was 685 tonnes, 510 tonnes was exported to Japan. The increase of the price per kg chicle could make it a more important NTFP, besides it is a rare product produced by a few countries Mexico, Guatemala, Belize and Honduras.

Mushrooms

Wild mushrooms are an important in the Mexican diet. They are especially found in the local market. The use of mushrooms in Mexico is mainly as food, medicinal and hallucinogenic mushrooms are not important on the domestic market.

In the state Oaxaca has a great number of useful species, important species are *Boletus edulis*, *Amanita caesarea* and *Cantharellus cibarius*. *Tricholoma magnivelare*; related to shi-take is an important export product, in 2000 about 4 tonnes was exported to Japan; the value for exporting every year is inconstant.

Seeds/Foliage

Chamaedorea palm is one of the most important NTFP for the export. It is a popular indoor plant in North America and Europe in USA *Chamaedorea* is an important plant in the cut green industry (14% of the market). *Chamaedorea* palms are growing in Mexico and Guatemala in forest as an under vegetation. As an NTFP the seeds are exported to nurseries, in the floriculture the decorative foliage is used, especially in Palm Sunday church services. *Chamaedorea elegans* is used for both seeds and foliage production; it does not produce seed in plantation because artificial pollination is difficult and costly. Other uses are palm inflorescence as food produced by *Chamaedorea tepejelote*, but this is less important as NTFP. The production of seeds varies every year; in 1997 the state San Luis Potosi produced 113.000 tonnes for an average price of \$17.000 per ton. In 1994 there was an annual

production of 1494 tonnes of foliage (cultivated/wild); in 1999 the production was nearly 2000 tonnes.

Honey and other bee products

Wild honey is an important NTFP in Mexico. This can be collected during a time of the year when other crops are not harvested. Other collected bee products are royal jelly, wax. Wild honey is important for the households, but also traded on the international market. Mexico produced about 56.500 tonnes of honey and exported about 25000 tonnes in 1998 (cultivated, wild).

The future for NTFPs

NTFPs could protect the natural forest, by the use of forest ecosystems in stead of changing the area into an intensive production. In this way species are protected and the biodiversity is secured.

The uses of NTFPs are influenced to some factors. In the region with other economic activities the use of NTFPs can change. Ecotourism can be a development for the area and can also protect the forest (35 projects 2000)². As the NTFPs are most imports for the low income groups, the use will go down in this way. This can also happen with an economic development on a national level, when for example more employment is created.

Upcoming economies can have an influence on the demand of NTFPs, if this is becoming higher, the prices could increase, and a better income is created for the participants. In this development a potential danger could be overexploitation.

To define NTFPs it will be clearer for consumer what they are buying and what the background of a product is, they are willing to spend more money for a specific product. There are three certification bodies that are already important for many products in social and environmental issues. For a sustainable forest production there is the Forest Steward Council (FSC) this is for the timber market, but can be important as well for other products made out of wood. Products coming from natural forests could be also certified as organic, this is already done on a small scale. The International Federation of Organic Agricultural Movements (IFOAM) has criteria for wild harvested products. The social component of the production is done by Fair Trade Labelling Organizations (FLO) to ensure the well being of a producer. A limited number of agro forestry products are already certified and its product range is increasing. Certification is often expensive and time consuming, but to ensure fair conditions this should be more developed for NTFPs.

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The Mexican Livestock Sector

Rita Khatir

General Information

Mexico, The United Mexican States, is crossed by 2 mountains, Sierra Madre Oriental and Sierra Madre Occidental, which are the extension of the Rocky Mountains from northern North America. From the east to west at the centre, the country is crossed by the Trans-Mexican Volcanic Belt known as Sierra Nevada. A fourth mountain is Sierra Madre del Sur, runs from Michoacan to Oaxaca. As such, the majority of the Mexican central and northern territories are located at high altitudes.

The condition results the Mexico as one of the world's most diverse weather system. The southern parts have a yearly median temperature between 24 and 28°C by the different temperatures between winter and summer is only about 5°C. The northern areas are hot and humid during the summer by yearly temperatures between 20 and 24°C. The third climate is the areas in the Valley of Mexico with altitude above 2,000 m. They have a year-round temperate climate with range temperature between 16 and 18°C and cool nighttime temperatures throughout the year.

Total land area is approximately 1.9 million km² consisted of agricultural land by about 1 million km² and forest area by about 63 thousand km². In 2007, Mexico has about 105 million people by annual population growth more than 1% (World Development Indicators database, September 2008). By this number, Mexico is well known as the world's 11th most populous country (Barkan, 1993; Wikipedia, 2009). Two-thirds of Mexico's poor people are farmers and farm workers and three-fourths of Mexico's extremely poor people live in rural areas {Levy & van Wijnbergen (1992) in Martin (1993)}.

In 2006, the GDP of agriculture, livestock, forest, and fisheries accounted for 5.4% of the national GDP. The GDP of livestock activities accounted for 23% of the agricultural GDP (Semarnat, 2008). It can be said that livestock is an important factor influenced the development of Mexican's economic. Even, Barkin (1990) stated that there was a phenomenal growth of the livestock sector due to the modernization of Mexican agriculture since 1965.

Livestock resources in Mexico

The production of cattle, chicken and pigs grew rapidly until the onset of the crisis in the 1980s. It was supported by government policy to change the Mexican agriculture instantly (Barkin, 1990). This expansion was accompanied by an industrial transformation. Natural pastures, household wastes, agricultural residues and other similar resources which used for the household production of livestock were replaced by technologically systems that now rely on cultivated pastures, improved breeds of animals, heavy use of antibiotics, and confined feeding of balanced animal feeds {Suarez & Barkin (1990) in Barkin (1990)}. The condition also led to the competition between humans and livestock for the use of the country's land and other agricultural resources to produce animal feeds (Barkin, 1990). In addition livestock activities were also having difficulties competing with imported products, although the situation varies in the different areas. But, in general there were two factors threat livestock activities, that is, the demand construction during the economic stagnation of the 1980s, and a lack of investment which led to an increasing technological gap with the USA {Chauvet

(1993) in Appendini (1994)}. The brief figure from the recent development (2003-2007) of each livestock sectors can be seen from the Table 1. As the comparison about how phenomenal the growth of livestock production, the Table is also completed by the data in 1970, 1980, and 1990.

Table 5: Population of Livestock in Mexico (1000 head)

Year	1970	1980	1990	2003	2004	2005	2006	2007
Cattle	22,798	27,742*	32,054*	31,4767	31,248	28,763	28,649	29,000
Goats	9,127	9,638	10,439	8,991	8,852	8,886	8,897	8,900
Sheep	6,113	8,482	5,846	6,819	7,082	7,624	7,484	7,500
Pigs	10,298	16,890*	15,203*	14,625	15,177	15,342	15,370	15,500
Poultry	148,300	192,618*	248,055*	418,721	436,854	492,063	293,899	294,300

(Source: FAOSTAT, 2009 and *FAO report, 2005)

Cattle

There are three ecological regions define the cattle industry: (1) the arid-semi arid north region; (2) the southern tropical region; and (3) the temperate central region. The three regions shared the same proportion of cattle industries around 33 to 34% (Vega & Williams, 1996). Actually, the geographical conditions of the regions influence the central of human population and livestock population.

Approximately about one million head of cattle are shipped to the United States yearly, especially from the northern Mexican states of Chihuahua and Durango. The purposes are for pasture, back-grounding, finishing, and slaughter (Skaggs, et al., 2004). There is a special trend of cattle export-import in Mexico because Mexico is not only the largest exporter of the feeder cattle to the Unites States, but Mexico also imports back the cattle for the consumption and breeding (Barrett & Fabiosa, 1998). For example in 2005, Mexico exported nearly 1,258,758 head of cattle and also imported 84,701 head of cattle (FAOSTAT, 2009).

It is found a decrease trend in cattle population. Barrett & Fabiosa (1998) stated that the fact is influenced by the increase of slaughter, the increase of feed and veterinary costs, and the prolonged drought. Of course, the domestic need is also the most important purpose of cattle production. In the 1980s, beef was still considered a semi-luxury commodity that was consumed mostly by the middle- and upper-income households in Mexico (Barrett & Fabiosa, 1998). The situation was caused by the meat price that is considered to be higher than the other products. So in 1982, the meat consumption was around 41.5 kg/capita/year (Vega & Williams, 1996). At the moment, by the increase of socio-economic status, the consumption of meat per capita seems to be higher; it is around 58-59 kg/capita/year in 2003 (FAOSTAT, 2009).

In 2006, beef production has increased from 1,329 tons to 1,613 tons. It was also reported that the dairy industries produced more than 10 billion liters of milk (Semarnat, 2008). It shows that the cattle production both for meat and milk are a strong factor should be accounted in the Mexico's livestock sectors.

Sheep and goats

The Mexicans are keeping both sheep and goats as small ruminants. The number of goat populations is higher than the number of sheep populations, but the increase in sheep production is higher than that of goat. Sheep and goats production in Mexico is not sufficient so that the imported sheep and goats in 2005 reached 84,002 and 3,176 head respectively, but the number of imported head was reduced drastically since the production also increased (FAOSTAT, 2009).

Hog

There are three types of hog production: (1) the intensive and more technologically advanced sector, (2) the semi-intensive or moderate technology sector; and (3) the rural or low technology sector (Vega & Williams, 1996). The production of hog showed a flat increase during the period of 2003 to 2007. The pick production was gained in 1980 at 16.8 million heads. The trend of pig trade is different from beef trade because there is only found an import flow. In 2005, Mexico imported about 181,313 head of pigs (FAOSTAT, 2009).

Pig-meat consumption in range 2000 to 2003 is also stable at 12 kg/capita/year (FAOSTAT, 2009). The lower-income families consume most of the pork in Mexico (Barrett & Fabiosa, 1998) since the pig-meat price is lower than beef. It can be correlated to the research done by Ricalde et al (2004). They found that in rural communities one of the main species kept in the backyard is pigs. The rural communities also assume the pigs as "pig bank" which means that the pigs can be converted into money when cash is needed for any family emergency.

Poultry

Poultry industries can be categorized into: (1) small individual producers with 2000 to 10,000 birds that do not produce their own feed and that have little or no access to the main market channels; (2) associated producers, the owner of 10,000 to 50,000 birds that mix their own feeds and that have access to genetic materials; (3) semi-integrated producers that have about 50,000 to 100,000 birds; (4) large-integrated enterprises with more than 100,000 birds (Vega & Williams, 1996). Nearly 67% of Mexico's poultry production is located in the central region (Bierlen & Hayes, 1994 in Barrett & Fabiosa, 1998).

The main species kept consists of chickens and turkey, but the trend is dominated by chicken at level 97% (FAOSTAT, 2009). If it is compared to the other livestock resources, the production of poultry is the highest. The production of broilers is accounted for 24% of the total livestock production (Semarnat, 2008). The increase of poultry production is stimulated by technological advancements, vertical integration, improved genetics, and better management practices (Barrett & Fabiosa, 1998). Starting in 2006, the poultry production decreased, but this number was still the highest compared to the other livestock productions.

Livestock Unit

To evaluate the contribution of livestock simultaneously, livestock unit can be used. By using the conversion factors for cattle (0.7), sheep (0.15), goats (0.1), pigs (0.25), chickens (0.01), and turkeys (0.03), the total livestock units in Mexico are tabulated in Table 6 (FAO, 2003). Although there is a slightly decrease in the number of livestock units in the last two years, the livestock production has shown an accelerated growth in the last two decades

(Semarnat, 2008). Contribution of different species to the total livestock unit can be seen in Table 7. The highest share is performed by cattle where as the lowest share is shown by sheep and goats.

Table 6: Total Livestock Units (LUs) in Mexico

	2000	2002	2005	2006	2007
Total LUs	27,616	27,619	26,006	25,912	26,193

(Source: FAOSTAT, 2009)

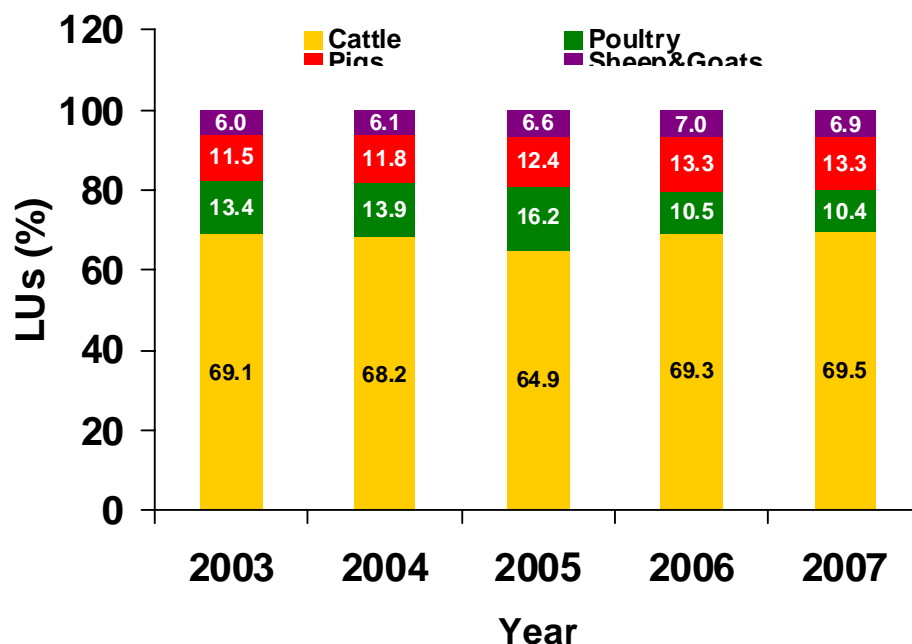


Table 7: Contribution of different species to the total livestock

Conclusions

Livestock sectors play an important role in Mexican's economy, but its growth was much influenced by government pressure. The main resources of livestock sectors in Mexico are cattle, sheep and goats, pigs, and poultry. The population growth of cattle and poultry has the same trend both in increase and decrease, the population growth of sheep is a little bit increase, the population of goats is stagnant, and the population of pigs decreases. Meat consumption of cattle and poultry has increased, whereas meat consumption of pigs is stagnant. Poultry industries produce the highest population, but cattle industries produce the highest value due to LUs.

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From political Independence to the Revolution with Emilio Zapata & Benito Juárez

Verena Tigges & Matthias Klaiß

Late colonial New Spain

The late colonial New Spain period began with the coming into power of the Bourbons as Spanish kings at the beginning of the 18th century. Its evolution is mainly characterized by the Bourbon Reforms that led to an increase of immigration and economic growth for the colony which entailed at the same time social contrasts and stratifications. On the other hand the Bourbons set high taxes, officially for the modernisation of the country but also the mother country Spain profited of the revenues. Therefore large army was necessary to avoid uproars and to provide security. (Hamnet 1999, Ewald 1994)

Administration and dependence of the “Mother Country” Spain

The Administration was under the rules of the vice king and two judges (Oidores). All orders came from the Spanish crown, but were performed by the vice king and the oidores, that has legislative and executive functions. But as the mother country was quite far away and it took several weeks to carry information and orders from one side of the ocean to another, New Spain's authorities, especially the held a lot of power and kept a certain autonomy. Nevertheless the country was dependent from the decisions and political events that took place in Spain as shown in the economic rise caused by the Bourbon reforms. And, in fact, the struggles in Spain and the appointment to Spanish king of Napoleons brother Joseph in 1808 were one of the major reasons that lead to the independence movement in New Spain. (Ewald 1994, Merill, Miro 1996)

The role of the church

Different religious order like the Jesuits played an important role in the economy of the colony. They owned great parts of the land in New Spain which they got as donations. With their farsighted management they hey had a stabilising effect on New Spains economy. Because of the huge wealth of the orders, which members had no personal property, they served as largest “credit institute”. Furthermore they cared for the education of the colonies offspring. But because of their influence and their wealth the Jesuits were expelled by the Spanish crown in 1767. This stirred up a widespread opposition against the crown in New Spain.

Religion was always a source of political energies, changing expectations and issue of conflict. In the example of Mexico's history this fact becomes manifest for example in the time of the Conquista. But on the other hand Jesuits like Bartolomé de Las Casas in the 16th century fought for the rights of the Indios. And, not to forget, although the church and their organs profited of the privileges set down in the colonial law, it were catholic priest that started and lead the first independent movements, waving a banner with the Virgen de Guadalupe and shouting “¡Viva la Independencia!” (“Grito de Dolores”). These opposed effects of the church and their representatives on the Mexican history show the enduring ambivalence of their role. (Archer 2003, Ewald 1994)

Social and economic contrasts

A small circle of businessmen dominated the principal economic activities. These actors hold a great personal wealth. The display of their wealth was in contrast to the living conditions of the majority of the population that was working in the mines, as campesinos (peasants) or as peons on the big haciendas. Agriculture was dominated by the Haciendas, large land-holdings that were an end in themselves as the marks of status. In the agricultural sector mostly the Hacienda owners profited of the revenues. Another source of stratification was the existence of different ethnic groups. The Peninsulares, citizens coming directly from the mother country, thought of themselves to be superior. They were in important positions in the administration and usually had a better education as the Criollos, citizens from Spanish origin that were born in the colony. The indigenous people were not much respected. Their personal rights and territories were protected by the law that was often avoided. (Hamnet,1999, Ewald 1994)

The Independence

Most historians agree that the Mexican Independence movement came not out of certain planning from the side of the Mexicans but was mainly determined by coincidence and the political events in Europe. Only a combination of social and cultural factors enabled a large-scale popular mobilisation in the former loyal colony. The change of the dynasty in 1810 increased state pressure on the revenues and the jurisdiction of the church. It was the first time that all classes in the colony agreed with the fact that taxes were economically and psychologically intolerable. The historian Eric van Young expressed the situation like this: "The rebellion resulted from a fundamental sense that something had gone wrong in the world and that the external realities no longer conformed to the moral order of country people". But the immediate cause of the insurrection of 1810 was the collapse of the viceregal government's legitimacy. In 1808, The French removal of the Spanish Bourbons caused confusion in the colonies about governments legitimacy. While the Peninsulares asked the citizens to wait for further development in Spain, the Criollos demanded the autonomy of the country. (Hamnet 1999, Ewald 1994)

The Insurrection of 1810

The insurrection of 1810 was led by father Miguel Hidalgo, a parish priest of Dolores in the dynamic province of Guanajuato in the North of Mexico City. He had an open house for all classes where social and political issues were debated. Being persecuted by the Spanish army, he called the people of his parish to join the struggle of independence and did the speech that is still known as the "Grito de Dolores". This event is still celebrated today as the day of independence in Mexico (16th September). This movement found many supporters in the Criollo population and led to armed hostilities in the whole country. But many of them were deterred by the cruelty of the movement killing all peninsulares that were against the autonomy. After Hidalgo's execution in 1811 he was followed from 1812-1815 by father José María Morelos, who had a small disciplined army that avoided needless deletion. In the following years the ruthless behaviour of the Spanish army and its leaders led to a loss of sympathy with the Spanish in all classes in the colony. (Miller 1986, Hamnet 1999)

Iturbide

The wars of independence came to an end with the collaboration of Iturbide, the leader of the Spanish forces, with the rebels. Different reasons for his change of mind were mentioned. On one hand it is alluded that he, as a conservative, didn't agree with the liberal movements, anticlerical laws and the general chaos in Spain. On the other hand he seemed

to cope with the Ideas of the rebels and declared 1821 the "Plan of Iguala". The major Ideas of the document were the "three guarantees": Independence, supremacy of the Catholic faith and equality of the creole and peninsular classes. These Ideas were a base to build a coalition for the parties that for almost ten years had been fighting one another. As no European monarch was found to be crowned as the King of Mexico, Iturbide was crowned in 1822 as Emperor Augustin I. But as he reigned with rigour and military force he abdicated two years later and the congress nullified their election of Iturbide as emperor. In 1824, a republican constitution was drafted creating the "Estados Unidos Mexicanos" with Guadalupe Victoria as its first President.

The young republic

The new state was a federal republic that was based upon the US constitution. It integrated the ideas of Montesquieu in the separation of powers. In the eyes of its creators it should have been the base of a prosperous new country. But the long period of the war of independence and the fact, that nobody was prepared for the independence posed several challenges to the young republic.

First they faced economic problems. The eleven years lasting war of independence was very expensive and the economy was shattered. The important mining industry was in disarray. Agriculture was similarly impacted, Hacendados murdered and the fields burned, livestock killed or dispersed. Commerce with Spain was at a standstill and no new supply lines were established. When Iturbide set down in the treaty of Cordoba, which gave Mexico the independence from Spain, he also agreed in compensations for the Spanish possessions. Because of the constant threat of an invasion by the US or European armies the Mexican army has doubled in size and took up a huge share of the state budget. To keep up the regime, Mexico was forced to take credits in Europe but soon lost its creditworthiness in the judgement of the international banking community.

Another obstacle was the political instability. The egoism of all pressure groups and the "caudillismo" complicate an agreement. No president was able to unite the different classes and interest. Between 1833 and 1855 the presidency changed 30 times, General Santa Ana was elected 11 times. Conservative and liberal presidents alternated. Many of them came to power by a coup d'état or violently. (Miller 1986, Ewald 1994)

Wars

The instability led to civil wars, like the Texas War of independence and several uprisings. The two Indian wars (Yucatan Secession and the Yucatan rebellion) were caused by the oppression of the indigenous people. The Haciendas usurped their land and water rights. That caused poverty, hunger and dependence on the Criollos in the indigenous population.

In the same way, instabilities made Mexico to be regarded as an easy prey for other nations like the US, England and France which were interested in the enormous mineral riches and unrealized agricultural potential. They used the slightest provocation to attack the country. A good example is the Pastry war 1838 when France attacked Mexico because they didn't accept to pay compensation to a French Pâtissier that has been robbed by Mexican soldiers ten years before.

In the War with the United States Mexico lost half of its territory which is represented today by California, Nevada, Utah, New Mexico, Colorado, Wyoming and parts of Arizona. Whereas the war is forgotten or seen as a triumph by the US, the legality of this war is still seen as debatable from the Mexicans which haven't accepted the defeat. (Miller 1985, Ewald 1994, Hammet 2003)

Table 1: Mexican Wars from Independence to the Revolution of 1910

1810-1821	Mexican War of Independence
1822-1823	Central American Federation War of independence
1835-1836	Texas War of Independence
1838	First Franco-Mexican War "The Pastry War"
1839-1843	Yucatan Secession
1846-1847	US.-Mexican War
1847	Yucatan Rebellion
1859-1861	Civil War: War of the reform
1862-1867	Second Franco-Mexican War
1899-1904	Yaqui Indian War
1910-1920	Mexican Revolution/Civil War

Benito Juárez

Benito Juárez was the first Mexican President that was able to reign Mexico for a long period (18and who was able to unite liberals and conservatives. Furthermore he was the first President that did not have a military background. He tried actually to bring its country peace and tranquillity. He is still admired by the Mexicans for his services on the Mexican State. His integrity, his simple way of life and his abilities to reign a country under adverse conditions caused the admiration of his contemporaries. Lincoln's secretary of state, William H. Seward declared Juárez the greatest person he met.

Benito Juárez was born as the son of zapotec parents and orphaned in a young age. Due to the gratitude of a priest, he was able to get educated. He received a law degree, entered in politics and became governor of Oaxaca in 1848. Inspired by European intellectuals like Rousseau, his liberal policy led to his exile by President Santa Ana. Like other Liberals he was regarded as dangerous for his regency.

He returned after the liberal revolt of 1855 and initiated, first as justice minister, later (1861) as President, the liberal reforms. These reforms were meant to abridge the wealth and power of the Catholic Church and to abolish slavery and all titles of nobility.

Unintentionally by the liberals, the reforms were seen by the church as an attack on church dogma and led to the Reform Civil War which ended two years later with the victory of the Liberals. But the war led to a radicalisation of the laws. Later on, Juárez added laws to make education mandatory and to reduce government purchases by reducing the size of the army. But he was not able to find a solution for the chronic economic problems of the country. His inability to pay the interest on Mexican foreign debts caused a war with European Nations. The defeat of the Mexican army was followed by a 6 years lasting bizarre episode of regency of the Habsburg Maximilian I. After his death, Benito Juárez was re-elected and continued his regency until his own death in 1872.

The zapotec presidents popularity increased the esteem of the indigenous people. But unfortunately his regency worsened their situation, an development that was continued under the following Porfiriato. (Miller, 1986 Hamnet, 1999 Ewald, 1994)

Conclusion

Mexico came to its independence “by default”, influenced more by external than internal developments. Hence, the country and its citizens were unprepared and not ripe for independence. Economic problems and internal disaccord led to numerous wars which worsened the situation for the country. The reasons for disaccord were founded in colonial times, and no president was able to reach reconciliation of all classes.

From Porfirio Díaz to the Mexican Revolution

The Era of Porfirio Díaz

Born in 1830 in Oaxaca City, Porfirio Díaz grew up in decent conditions. His parents had a mestizo background. As his uncle was a priest and later on Bishop of Oaxaca, he was sent to a seminar to become priest as well. After breaking up with his family he went to University to become a lawyer after the Mexican-American War. As a student he occasionally came in touch with Benito Juárez, who was in several occasions a professor and director of the institute he studied. Being fascinated and convinced by liberal ideas, he gave publicly his vote for Alvarez instead for Santa Anna and he broke with the establishment in the university and started his military career. As the public support for Lerdo de Tejada decreased fast, he took his chance and occupied in November 1876 Mexico City, forced de Tejada to abandon and took over the government. In spite of his earlier conviction of “No-Reelection” (a president should be in charge for that duty only for one legislation period), he managed to rule for 7 legislation periods, only interrupted by the installation of president Manuel Gonzalez (1880-1884), who continued the direction started by Juárez and Díaz (Ewald, 1994). The time of his reign is known as the Era of Porfirio Díaz (1876-1910).

Situation in the country

After 55 years of independence, Mexico's economy lagged hopelessly behind the USA and Western Europe. Education, culture and to modern technology was only accessible for a small part of the population. Plans to built up a railway infrastructure existed but were not carried out. The sheer amount of external debts inhibited the self-development of the country. The average Government since then lasted one year, only two governments completed a full legislation period. Now, as peace had been established and maintained only by the military forces, the focus of Porfirio Díaz became the economic development of the country. He became the president of order and progress; he tried to enhance the development by attracting foreign investments, repayment of all debts and maintenance of inner stability under all circumstances (Ewald, 1994). To attract foreign investments, internal security, governmental concessions and subsidies, cheap docile labour and rich natural resources were maintained. In the year 1910, investments from US and EU mounted up to \$ 2 Billions, the half them were from the US (Miller, 1986)

In contrary to the former presidents, Díaz restricted the freedom of speech and the press. Knowing about the undermining effects of the press to the former governments, he justified this action with the statement that Mexico was not ready for it. His policy of “pan o palo” (bread or the stick) rewarded those who conformed with the regime and punished the opposition. He enlarged the hated police troops “rurales” to keep riots down and to suppress the population. He even cut his own salary, fired a lot of useless public officials and tried to cut down the smuggling activities. Under Diaz the dormant Universities were activated, scientists called “científicos” arose as consultants of the government, with the intention to solve all the problems of the country with scientific methods, with statistics and sociology.

(Miller, 1986). For example British engineers solved the flooding problems of Mexico City. Others tidied the national finances. (Ewald, 1994) The rise of western influence and science in the government caused a Europeanization of the upper class; the idea of social Darwinism infected the educated circles (Miller, 1986). The inner stability on the surface of the country was in sharp contrast to the suppression and marginalisation of the poor masses. In contrast to the former governments, the church enjoyed a comeback to the Mexico.

The Industrialization

In 1884, Díaz started the industrialization of Mexico. Around the turn of the century, Mexico had for the first time an active balance (assets), the country was internationally recognized for his efforts to develop. By the time Díaz took over the country, only 617 km of railway existed. In the year 1911 the railway network was extended to 25000 km. After the transcontinental railway had been built in the US, American companies invested in the Mexican railway system. Díaz bought the majority of the shares of the most important tracks for the Mexican government. With that significant improved infrastructure, other industries started to develop, primary production started to boom. Within a few years, the use of modern sophisticated technology revolutionized especially silver mining. But also other resources were dug, like copper, zinc, lead, iron, and more and more oil. By the year of 1910 more than 100000 Mexicans were working in the mining sector. Most of the mines were owned by American citizens, from the 1030 mines at this time 840, Mexican citizens owned 148, the rest was property of British and French citizens. (Ewald, 1994).

Influence in agriculture

In agriculture the access to the markets via railway changed a lot. Since the middle of the 19th century and especially in the reign of Díaz foreign capital and knowledge was to be attracted to use the capital and the technical knowledge. A lot of arable land was developed where before only animal grazing was possible. Especially near the railway the large-land holdings experienced an industrialization of their production methods. The use of machinery, the application of new and more productive breeds and modern agricultural production methods revolutionized agriculture. In Yucatan the large scale production of sisal for the north American market allowed a decent wealth on the haciendas. The competition for production resources like land and water became apparent.

The land distribution became successively unequal, by the year of 1919 834 persons owned more than 90% of the arable land, in contrast to 9-10 Millions of landless workers. The family Terrazas in Chihuahua owned 405000 ha alone.

The dark side of the industrial bloom under Díaz experienced the native Mexican population and their traditional small scale agriculture. In addition to the competition for water and land, in which the traditional Mexican village had no voice, the downgrading and marginalizing of the natives by the regime of Díaz caused a severe insult on the native communities. Thousands of the not repacified Yaqui and Mayo were killed or enslaved and shipped to work on the sisal plantations in Yucatan.

The inner stability allowed the population to increase by 62% from 9500000 in 1876 to 1520000 in 1910, which led to a huge surplus of workforce in rural areas. One aspect of the big production units was, that they were able to produce enough surplus food for the enlarged population, whereas the traditional small scale agriculture would have had no capacity of doing that.

The ongoing sell-out of the country to foreigners caused an increasing anti-foreignism in the population. Some critics stated that "Mexico became a mother to aliens and stepmother to own citizens " (Miller, 1986)

The Great Revolution (1910-1940)

The Great Revolution can be characterized in two main phases. First, the military phase from 1910-1920, second, the restoration phase from 1920-1940.

It was the fight for social justice partly as a legitimate request, part wise also as a political parole. To a large extent, the situation after 1910 in the country was comparable to that after the independence war: anarchy and chaos reigned. A lot of different groups and leaders with different ideas were involved in the fighting, even foreign governments tried to influence the fighting for their benefit, in terms of weapons distribution or even secret service activities. Some groups fought for equal land distribution, others for protective labour laws or nationalization of utilities, limitation of church power and many other changes. They were villagers, intellectuals, soldiers who wanted to make their fortune, unemployed factory workers, hacienda peons, teachers, students, newspapermen and many others. (Miller, 1986)

Destruction, bloodshed and calamity came over the land. Between 1910 and 1920 almost 1 million people lost their lives. The revolution was prepared by leftwing intellectuals, the charged education for all, an eight hour working day, a six day workweek and the prohibition of child labour. Especially the situation on the huge haciendas, the annihilation of the native ejidos, the former communal land, was a cause for grievances. In these days the term "campesino", for small scale farmer, started to substitute the term "peón", for landless farm worker. (Ewald, 1994).

It all started, when Díaz in 1908, 78 years of age, gave a interview to an American journalist, which was supposed to be published only outside Mexico. Díaz stated that Mexico was now ready for a democracy and he would retire in 1910 (but he had no intention to retire). He was very embarrassed to see the interview published in Mexico. The opposition formed, amongst them Francisco Madero, a rich, vegetarian cotton farmer with mild manners and a high pitched voice. He wrote a critical book about the regime of Don Porfirio, spoke to the masses and challenged the dictator by becoming a presidential candidate. He believed in a democratic change, not a revolution. After his release from jail he fled to Texas, where he gathered other Mexican exiles around him and published a call to arms. The uprising started, riots started everywhere, and Madero was surprised. He entered the revolution.

He had a lot of followers, the most famous amongst them Emiliano Zapata and Pancho Villa, they fought a lot of battles against the troops of Díaz.

Finally Díaz' withdrew and went to Exile in France, with the comment, that Madero had unleashed a tiger, and he would be interested how he would control him.. (Ewald, 1994)

Madero became provisional President in 1911, but apart from three revolutionaries the cabinet posts were still held by Porfirio Díaz holdovers. It appeared that the Revolution was over, but it just began. Unable to start important reforms and being an inexperienced, utopian president ruling in accordance to the law, he lacked the support from cabinet members, church and the military.

Disappointed by the slow reforms, many of his followers broke with Madero to start their own revolution. Zapata, operating more in the southern states around Morelos wanted to give back the hacienda land to his campesinos, whereas Pancho Villa, operating in the north, fought for a democratic Mexico (Miller, 1986). Madero was caught by his enemies and shot 1913 on the way to prison.

The next President, the officer Victoriano Huerta maintained his influence and got rid of his enemies by murder and governmental troops. Under his reign a lot of schools were built and at least some efforts were made to integrate the native Indians, some of the stolen land was given back to them. As the constitution did not allow expropriation, Huerta tried to break the haciendas with high taxes. As he had a lot of enemies, American warships conquered the harbour of Veracruz in 1914 and Zapata and Villa won a lot of battles against governmental

troops, Huerta retired in July 1914. The situation in the country got out of control, every state of Mexico had now his own revolution and battles.

Under President Venustiano Carranza (1859-1920), who was supported by the American President Woodrow Wilson, Mexico was given a new constitution in 1917. He was properly elected and experienced in politics. The new constitution was very much more opposing the church compared to the one from 1857 and made with article 27 an expropriation of haciendas and the redistribution of land to the native Indians possible. Foreigners were excluded from the possession of land, also divorce was legalized and debt peonage prohibited. For Zapata and Villa the new President acted too slow, and he opposed the expropriation of the big land holdings, which may also have been the reason he was the most successful politician in this decade. Anyway, being responsible for the killing of Emiliano Zapata in 1919, he was killed only one year later during a military coup of two subsequent Presidents, Alvaro Obregón and Plutarco Elías Calles.

Under President Obregón, the efforts to continue the integration of the native and rural population in the Mexican society were continued with extensive education programmes. Knowing the suffering of landless; he knew as well that the large land holdings were needed to feed the population. He pacified the country for a short period, so that Plutarco Elías Calles could be elected 1924 in normal circumstances.

Calles cut back the military, tried to increase the military quality and brought the forces under governmental influence again. He structured mercilessly the national finance. For the first time after a long time an American ambassador came to Mexico and negotiated as an equal, Calles granted oil mining concessions. He carried out his social reforms more aggressively like his former colleagues. To balance the production losses from the land redistribution, he invested in irrigation projects. To avoid speculation, the land was given to the campesinos in the ejidos only under the condition that it was cultivated.

As the Archbishop of Mexico City in 1926 stated, that the Catholic Church would not accept the anti-church constitution, Calles acted without compromise and applied the laws for the first time and a lot of clerical institutions were closed. The church announced a strike, refusing the worship and other spiritual services to the population. The population started a civil war against the anti-clerical government, the so-called Cristero Movement. It was cruel and brutal, approximately 100,000 people died.

The last president of the time of the revolution was Lázaro Cárdenas. He is considered to be one of the most radical of all Mexican Presidents. He supported labour unions and strikes, in his presidency alone there were 2800 strikes. He caused massive expropriations of hacienda land all over the country and redistributed it to the campesinos. He also welcomed the expropriation and collectivization of industry and service companies. He started with the development of tourism in Mexico by setting up a tourism ministry, he gave asylum for the fugitives from the Spanish civil war in 1936-39 and also for a lot of Jews in the second world war. (Ewald, 1994)

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Political and Economical Overview of Mexico

Fabian Cruz Uribe & Sergio Araujo Enciso

From Pri to Pan

The United Mexican States are a federation whose government is representative, democratic and republican based on a presidential system according to the 1917 Constitution. The Government has three levels: the federal Union, the state governments and the municipal governments.

In the recent History of Mexico, three political parties have played a main roll on its politics and government.

Institutional Revolutionary Party (Partido Revolucionario Institucional, PRI): The PRI is a party far from a socialist party in the traditional sense and more often than not, its policies are seen to be like those of a center-right party that ascribes to social democracy. It was founded on 6th March 1929 by Plutarco Elias Calles as National Revolutionary Party (Partido Nacional de la Revolución PNR), and transformed as Mexican Revolution Party (Partido de la Revolución Mexicana PRM) by Lázaro Cárdenas on 30th March 1938. Finally their sucesor on the Republic Presidence, Manuel Avila gave to the party the name PRI the 18th January 1946 (PRI, 2008). The party, under its three different names, contributed in the processs of modernization and stabilization of Mexico, but also, it was slowly acquiring a reputation for corruption, admitted by some of its affiliates (Camou, 1996).

National Action Party (Partido Acción Nacional, PAN): It is a center-right conservative party founded on September 17, 1939. Mexican Roman Catholics, together with other conservatives (mainly Manuel Gómez Morín), founded the party (PAN, 2008). They were looking for a peaceful way to bring about change in the country and to achieve political representation, after the years of chaos and violence that followed the Mexican Revolution. The PAN has been linked to a conservative stance in Mexican politics since its inception, but the party does not consider itself a fundamentally conservative party. The party ideology, at least in principle, is that of "National Action" which rejects a fundamental adherence to left- or right-wing politics or policies, instead requiring the adoption of such policies as correspond to the problems faced by the nation at any given moment (Villasana, 2007). This theory of National Action politics, rejecting a fundamental adherence to right or left, is held within a strongly christian context, and falls under the umbrella of Christian Democracy. The PAN currently occupies the right of Mexico's political spectrum, advocating free enterprise, privatization, smaller government, and liberal reforms as well as opposition to same-sex unions and abortion (PAN, 2008).

Party of the Democratic Revolution (Partido de la Revolución Democrática, PRD): As consequence of corruption, members of the PRI left went on to form its own party as the Party of the Democratic Revolution (PRD). It was founded in Mexico City on May 5, 1989 by Cuauhtémoc Cárdenas Solórzano, Heberto Castillo, Gilberto Rincón Gallardo, Porfirio Muñoz Ledo, other prominent PRI members and left-wing politicians. It is considered a center-left party, created by the coalition of socialists and liberal parties, such as the National Democratic alternative (PRD, 2008). The party was originally founded by including many smaller left-wing parties such as the Partido Comunista Mexicano (PCM, Mexican Communist Party), Partido Socialista Unificado de México (PSUM, Unified Socialist Party of Mexico), Partido Mexicano Socialista (PMS, Mexican Socialist Party) and Partido Mexicano de los Trabajadores (PMT, Mexican Workers' Party). The PMS donated its registration with the

Federal Electoral Commission (CFE) to enable the new party to be established (Villasana, 2007).

After the Mexican Revolution of 1910, the country had a deep political instability. Despite the armed phase of the revolution ended in 1920, Mexico had continued to encounter political unrest, and presidential elections were usually preceded by military uprisings (Rodríguez, 1988). After the assassination of the elected president, Álvaro Obregón, in 1928, the national political crisis led to the founding of the National Revolutionary Party (PNR) in 1929 by Plutarco Elías Calles. The objective of such party was to gather all the armies and forces under a single government. Nonetheless the aim was to bring peace, governance and democracy to Mexico, the presidents elected during the period 1929-1934; Emilio Portes Gil, Pascual Ortiz Rubio and Abelardo Rodríguez; were puppets of Calles (Camou, 1996).

In 1936, Lázaro Cárdenas arrived at the presidency, and arrested to Calles and his corrupt associates. He became, perhaps, Mexico's most-popular 20th century president. Some of the reasons for the success in Cárdenas's government were the the expropriation of the oil interests of the United States and European petroleum companies (Rodríguez, 1988), the establishment in 1938 the national oil company PEMEX (Petroleos Mexicanos), and the party PRM. As a person of leftist ideas, he provided many social institutions which are dear to the Mexican people. Cárdenas' successor Manuel Ávila Camacho gave to the party PRM, its present name PRI (Partido Revolucionario Institucional) in 1946 (PRI, 2008).

The PRI held an almost hegemonic power in Mexican politics since 1929. The first four decades of government of the PRI are dubbed the "Mexican Miracle", a period of economic growth through substitution of imports and low inflation. Much of the growth was spurred by successful national development plans which provided for major investment on infrastructure (Camou, 1996). From 1940 to 1970 GDP increased sixfold and the population only doubled while the peso-dollar parity was maintained (Rodríguez, 1988).

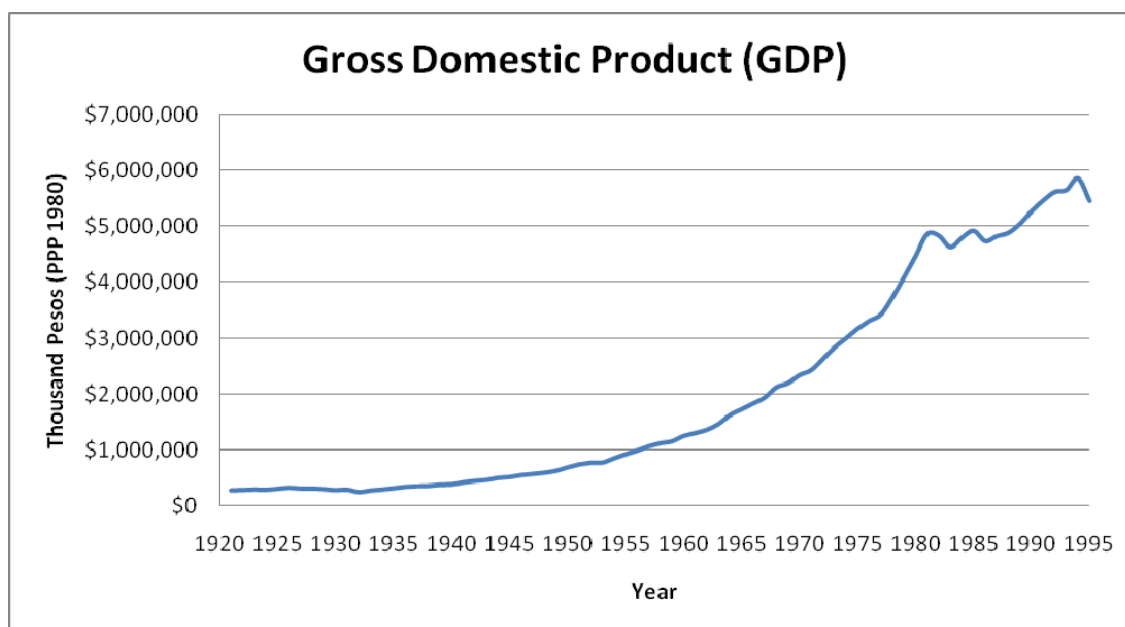


Table 8: Evolution of the GDP in Mexico (1920-1994)

Source: Own figure elaborated with data from the National Institute of Statistics Geography and Informatics (INEGI, 2008).

But after several decades in power the PRI became a symbol of corruption and electoral fraud. Critics claimed that voter suppression and violence, was used when the political machine did not work and elections were just a ritual to simulate the appearance of a democracy (Villasana, 2007).

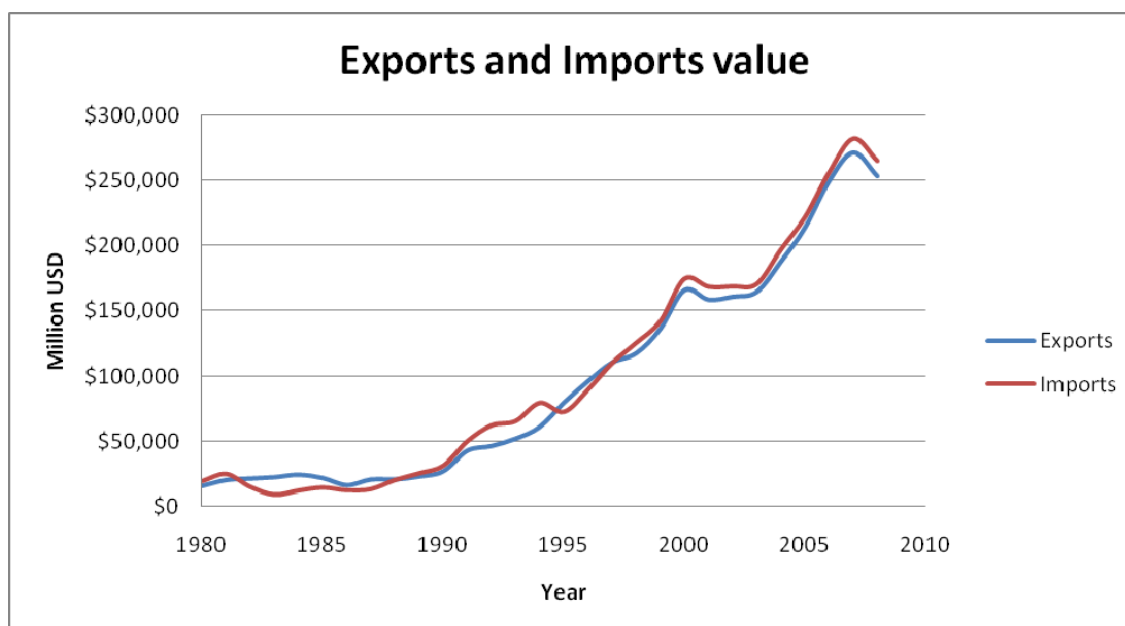


Table 9: Evolution exports and imports (1980-2007)

Source: Own figure elaborated with data from the National Institute of Statistics Geography and Informatics (INEGI, 2008).

The conservative National Action Party (PAN) became a stronger party after 1976 when it obtained the support from businessmen after recurring economic crises. Since 1977 consecutive electoral reforms allowed opposition parties to win more posts at the local and federal level (Larrosa et al., 2005). In 1982, Miguel de la Madrid was the first of a series of economists to rule the country, to implement neoliberal reforms (Camou, 1996). This resulted in currency devaluations to finance spending. An earthquake in September 1985, added more woe to the problems. Galloping inflation continued to plague the country, hitting a record high in 1987 at 159.2%.

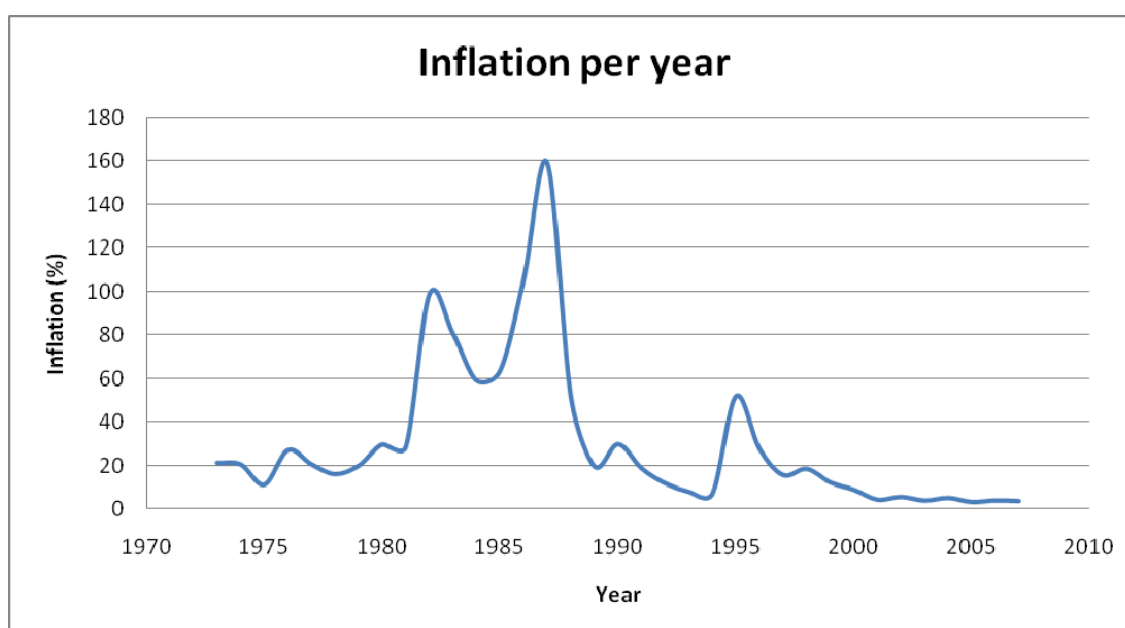


Table 10: Evolution Inflation per year (1973-2007)

Source: Own figure elaborated with data from the National Institute of Statistics Geography and Informatics (INEGI, 2008).

On 1994, for the first time since the revolution, a presidential candidate was murdered, Luis Donaldo Colosio Murrieta. His campaign director, Ernesto Zedillo Ponce de Leon, was subsequently elected in the first presidential election monitored by international observers (Camou, 1996). The 1994 economic crisis in Mexico, caused the PRI to lose its absolute majority in both chambers of the federal congress for the first time in 1997. This process culminated in the 2000 presidential elections in which Vicente Fox, candidate of the Alliance for change ("Alianza por el cambio"), formed by the PAN and the PVEM, won 42.5% of the popular vote and was elected president of Mexico. He became the first non-PRI president to be elected in 71 years. Today, PAN is the first political force of the country, and maintain the control of congress (Villasana, 2007).

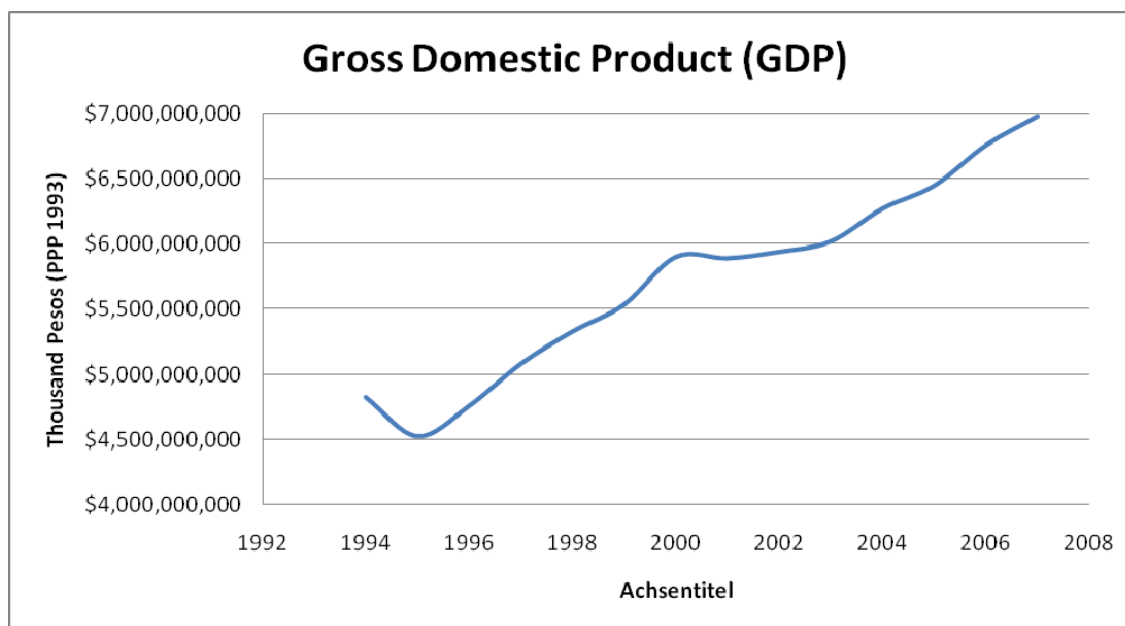


Table 11: Evolution of the GDP in Mexico (1994-2003)

Source: Own figure elaborated with data from the National Institute of Statistics Geography and Informatics (INEGI, 2008).

On July 2, 2006, Felipe Calderón (PAN) secured a plurality of the votes cast. Finishing less than one percent behind was Andrés Manuel López Obrador (Candidate PDR), who unsuccessfully challenged the results of the election (Villasana, 2007). Their party PRD now its the second political force of Mexico, and it has electoral presence in central and Southern Mexico (Espinoza, 2002). It has won gubernatorial races in some states including Baja California Sur, Chiapas, Guerrero, Michoacán and Zacatecas and it has also maintained control over the Federal District (Mexico City) since 1997 (PRD, 2008).

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The first post-modern revolution – the insurrection of the ‘Zapatistas’ in Chiapas

Daniel Stout

Introduction and Background to the rebellion

On 1st January 1994, the same day as the North American Free Trade Agreement (NAFTA) came into effect, the Zapatista Army of National Liberation (EZLN) seized several towns in Chiapas, declaring war on the Mexican state. This will be elaborated in the next section, but first some background to the EZLN is necessary:

EZLN was founded in 1983 by non-Indian leftists from central and northern Mexico; its bases in Chiapas are very much indigenous, and since the uprising all the commanders have been indigenous (Quiroz, 2004). The forces behind the movement are based in the injustices felt by Chiapas’ rural population over many years, combined with more recent, natural demographic and environmental pressures, such as soil erosion. Peasants have felt forced to move from the traditional Indian highlands into the tropical lowlands, where they have often conflicted with non-Indian cattle ranchers and the private forces of large landholders, as well as with each other. Furthermore, economic development through seasonal non-agricultural employment has led to greater inequality and increased divisions in indigenous (and non-indigenous) communities (Stavenhagen, no date). Many independent credit, marketing and land rights movements had been organising since the 1970s, and so it was these that provided much of the Zapatistas’ base (Stahler-Sholk, 2007).

The inauguration of NAFTA was viewed as the correct moment for the Zapatistas to begin their uprising. The agreement had also entailed a reform of Article 27 of the 1917 Mexican Constitution; peasants could no longer petition collectively for land, much reducing their prospects for a secure subsistence (Stahler-Sholk, 2007). Furthermore, prospects for Mexican farmers generally were worsened due to the opening of the market for American food products, and the removal of Mexican agricultural subsidies.

The Rebellion, 1st January 1994

On this day the EZLN seized several towns in central and eastern Chiapas, proclaiming a revolution. Other EZLN members travelled into the mountain areas to promote their cause and seek new members from the peasantry. Tourists and civilians were treated with courtesy, whilst circulars were distributed and broadcasts made from a captured Ocosingo radio station. The broadcasts encouraged other Mexicans to join the insurgency and to help dispose the ‘illegal dictatorship’ of the Mexican government, whilst calling on international organisations to come and monitor any violations of the Geneva Convention (Collier and Quaratiello, 1999).

The Mexican government responded by mobilising 12,000 troops. Within days, following a few small battles and an estimated 150 dead, the Zapatistas retreated into the eastern tropical lowlands. However, the Zapatistas had acquired the support of the media, and consequently the national and international public. They also had the support of the influential bishop of Chiapas, Samuel Ruiz. Throughout Mexico, many anti-government actions followed in the weeks following the government’s ceasefire offer (12th January), such as the seizing of town halls, whilst peasant and indigenous organisations stated their approval of Zapatista demands (Ibid).

On 21st February, peace talks began; The Zapatistas' spokesperson was Sub-comandante Marcos. However, the talks were hampered by a national crisis and confusion relating to confidence in the legitimacy of the government, and internal government conflict and accusations. This led to on 12th June the rejection of the tentative peace accord by the Zapatistas, in favour of a national convention which would reform the constitution (ibid).

Government actions

Whilst the government initially tried to portray the Zapatistas as native, gullible peasants led by foreign subversives, it later came to acknowledge that the Zapatistas had justifiable grievances (Collier and Quaratiello, 1999). The government preferred to suggest that the ultimate problem was poverty and that this could be solved by development aid and foreign investment, rather than choosing to deal directly with the demands of various organisations including the Zapatistas (Stavenhagen, no date).

The government kept troops in Chiapas to inhibit the EZLN's activity, and in February 1995, the government illegally broke the ceasefire by moving into areas previously held de facto by the Zapatistas. It was perceived by many as an attempt to capture Marcos, whilst the government stated that it was intended to bring the Zapatistas back to negotiations (Stavenhagen, no date). There has also been selective government assistance to those communities which have confirmed their anti-Zapatista stance (Quiroz, 2004).

There has been an increase in paramilitary activity in Chiapas, which is government-linked (although the federal army denies any involvement). Although the story has varying accounts, 45 unarmed, supposedly pro-Zapatista Indians were massacred in December 1997 by an unidentified paramilitary group (which many believe was linked to the government) (De Huerta and Higgins, 1999). There have also been various accounts of violence including murders, torture and abductions of Zapatista sympathisers and presumed EZLN members (Stavenhagen, no date).

The government has also made it harder to foreign observers to visit Zapatista communities, with the expulsion of 134 Italian observers in May 1998 being most notable (De Huerta and Higgins, 1999). Furthermore, in communities where autonomous and official governments coexisted, conflicts between the community members about Zapatista affiliation sometimes produced jurisdictional disputes and consequent clashes between the competing authorities, which the government used as pretexts for coercive intervention against the Zapatistas (Stahler-Sholk, 2007).

Critiques of 'development' strategies

The government has been accused of dishonestly and hypocritically using the language of sustainable development, agrarian reform and indigenous rights to promote so-called biopiracy (i.e. the commodification and commercialisation of natural resources, including in this case biodiversity, and even indigenous multiculturalism as a marketable asset for ecotourism). For example, indigenous settlers were removed from the Montes Azules region in order to make a 'biosphere reserve'; meanwhile, ecologically-destructive schemes such as African palm and eucalyptus plantations have continued to go ahead (Stahler-Sholk, 2007).

There has been no independent evaluation of the impact of investments (at least until 2000); increased spending will not necessarily lead to an improvement of rural livelihoods, especially where most investment has occurred in cities, and without community participation (Stavenhagen, no date).

Zapatista demands, ideas and initiatives

The Zapatistas did not aim to capture central power, but rather to revolutionise Mexico by building networks with civil society, and by proposing alternative national political reforms (Quiroz, 2004). They also aimed to unite members of differing religions by offering a new unified identity which validated class and indigenous collective identities; this applied especially to followers of catholic liberation theology and protestant denominations, which were separate from the 'traditionalist' Institutional Revolutionary Party (PRI) catholic religion (Stahler-Sholk, 2007).

The EZLN convened the Forum for the Reform of the State, which was a meeting of various political and social forces, aiming towards national proposals related to justice and democracy (De Huerta and Higgins, 1999). The Zapatistas are critical of the 'neoliberalism' project, stating that it disenfranchises and controls those who lack capital, and that collective priorities should be defined independently of the global market (Stahler-Sholk, 2007). A common statement that backs the Zapatistas' critiques is that the neoliberalism project (including NAFTA) has not improved living conditions for Indians in Mexico, but rather has caused increased inequalities, and consequent losses of communal networks and social compensatory institutions (Stavenhagen, no date).

The Zapatistas have periodically produced public documents ("Declarations from the Lacandón Jungle"). The first stated their basic objectives, namely: work, land, housing, food, education, independence, liberty, democracy, justice and peace (Stavenhagen, no date). Regarding individual rights, they state that the task is to recognise that there are infinite differences between people, and that all people should have equal access to the rights they need, and so a politics of tolerance and inclusion is necessary (De Huerta and Higgins, 1999).

A more direct relationship between authority and society is proposed, whereby decisions are taken by those who will be affected by them. It is stated that a politician's role is not to direct society, but to fulfil a function which is decided by society, and that politicians should thus be placed under vigilance and sanction. There should be a system for evaluating a government's work, and society should be able to reverse electoral decisions if the government is not performing its agreed role. Finally, the EZLN believes there must be an equity between the powers behind different political ideas, since traditionally some political parties have had greater financial power and other devices than other parties (De Huerta and Higgins, 1999).

Moves towards autonomy

The EZLN proceeded towards creating their own autonomous communities regardless of any potential agreements with the government. This has occurred in several stages:

- December 1994: EZLN announced their organised presence in 38 municipalities, in response to the military's attempted encirclement of the Cañadas region, which they had assumed to be the Zapatistas' centre.
- October 1996: EZLN boycotted municipal elections, refusing to recognise the elected authorities. They chose instead to follow their own systems, such as the traditional indigenous *usos y costumbres* (a system of choosing leaders in open community assemblies).
- Post-1997: Further institutionalisation of the EZLN autonomous systems, frequently including the expelling of the municipal government.

- August 2003: Regional representative Juntas de Buen Gobierno (good-government councils) were formed. These consisted of a governing council of two representatives from each autonomous municipality within a particular region, with the representatives changing each 10 to 15 days (Stahler-Sholk, 2007).

Models of autonomy

The Zapatistas state that they insist each community can develop or choose its own model of autonomy, as well as its own network of relations. One of the biggest challenges for the Zapatistas, however, has been to provide resources to its support-base communities, without converting back to dependence on those resources owned by external forces. This had been made more difficult by the surge in land invasions following the 1994 rebellion, by non-Zapatista communities. Furthermore, it is believed that the government has attempted to impede land acquisition and the keeping of existing land. The Zapatistas have been able to maintain 'self-sufficiency', though only via cross-community trading (Stahler-Sholk, 2007).

Two important aspects of the Zapatista communities' self-management have been community-controlled education and administration of justice. The education reforms included the expulsion of the teachers from the national Department of Education; this thus meant the loss of the meagre resources that had formerly existed, but also the gain of greater community control in designing relevant curricula. The Zapatistas have identified a consequent challenge of this new power over curricula: the design of the curricula without leaving behind those communities not affiliated with the Zapatistas (ibid).

The EZLN has been accepting support from NGOs; however, only following careful negotiations in each case, in order to avoid the dictation of the NGOs' preferences over the communities. The Zapatistas have criticised the NGOs by claiming the tendency of them is to decide what the communities need without actually consulting them. The Juntas de Buen Gobierno have sometimes charged a 10% tax for a region receiving an NGO project, with the funds then going into other communities in order to counterbalance the uneven development. Thus, the Zapatistas have been able to some extent to escape from the 'autonomy without resources' trap, without compromising their autonomy (ibid).

The San Andres Peace Accords

The San Andreas peace talks began in September 1995, some months following the breaking down in 1994 of the original tentative peace talks. Congress had enacted a law for 'dialogue and peace in Chiapas', thus establishing the ground for the talks. The National Mediation Commission (CONAI) headed by Bishop Samuel Ruiz, played a strong role in facilitating the discussions (Stavenhagen, no date). It led in February 1996 to the signing of the Accord of San Andres on Indigenous Culture and Rights, which meant the constitutional recognition of autonomy through *usos y costumbres* and collective land ownership. The demands put forward were a combination of those from various indigenous interest groups (De Huerta and Higgins, 1999).

However, the talks fell into trouble, and so although previously a discussion on seven topics had been agreed, the remaining six topics (such as the second topic on 'democracy and justice') never began. In December 1996, a commission of representatives from the various political parties, named COCOPA, was formed to try and rescue the peace process. It attempted this by negotiating separately with both the EZLN and the government, and then making a text compromising the separate demands. This text was then accepted by the EZLN, but not by the government. The latter produced in January 1997 their own agreement which had been stripped of most of the indigenous rights that had originally been agreed.

The Zapatistas naturally rejected this, before deciding to quit the negotiations and return to their Chiapas strongholds (Quiroz, 2004). The Zapatistas later stated that they would resume talks if certain previous conditions were upheld, namely the adherence to the original San Andres Accords, the partial removal of the federal army to the positions held before the illegal 1995 manoeuvre, and the removal of paramilitary groups from the region (Stavenhagen, no date).

Development post-2000

The situation took a hopeful turn in 2000 when Vicente Fox was elected, making him the first president from the centre-right opposition party in modern Mexican history. Within the first month of his office, the federal army retreated from positions demanded by the EZLN, and over 100 EZLN members were released from prison. Then in early 2001, the COCOPA Indigenous Rights Initiative was sent to congress. However, following the March 2001 speech of the EZLNs Comandante Esther in support of the originally accepted COCOPA version, congress decided to approve a newly modified version, in which the right to indigenous autonomy had been approved, but not in a national context – each federal state was to define their own legal meaning of ‘autonomy’. Thus, the EZLN again rejected the law and severed contacts, making the talks a failure (Stahler-Sholk, 2007).

Brief summary, and some concluding remarks

The Zapatista movement was built on a history of injustice felt by the indigenous and non-indigenous rural peasants of Chiapas. Following a brief rebellion in 1994, a peace process began which, although for a time was looking hopeful, has failed to achieve success. The Zapatistas have proceeded to create autonomous communities, regardless of the failed peace talks, with all the consequent new challenges and opportunities. As suggested by Stavenhagen (no date), it is thanks to the EZLN that the awareness and respect for Mexico's indigenous population has become greater. Furthermore, the survival of the Zapatista communities, in spite of government efforts to undermine and divide them, is no doubt an inspiration to other movements in Mexico and beyond which seek to create local and national alternatives to neoliberalism (Stahler-Sholk, 2007).

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Catholicism in Mexico

Alison Roberts & Nina Rakow

Catholicism in Mexico: From La Virgen de Guadalupe to Liberation Theology

This essay attempts to give a brief introduction into Catholicism in Mexico as it began and how it has evolved to its current form. The first chapter of this essay is broken down into more historical sub chapters on the arrival of the Spaniards (1.1), the Virgin of Guadalupe (1.2), and the widely celebrated Day of the Dead (1.3). Afterwards, chapter two will look at Catholicism in present-day Mexico and how it relates to liberation theology (2.1), and look at the present state of the institutional church (2.2), which will be followed by a section about the rise of evangelical charismatic churches (2.3).

The arrival of the Spaniards

As with all the other Spanish conquistadors that set out toward the New World before him, Hernán Cortés was required by the Spanish crown to convert the native populations to the Catholic Church. The legal guideline behind the Spaniards actions was the so-called Requerimiento. The Requerimiento, which was written by Juan López de Palacios Rubios and which was backed by the Inter Caerta put forward by Pope Alexander VI, gave supreme power to the Spanish crown over all lands and peoples in Latin America at the start of the conquest. The Spaniards, in return, had the task of converting the local population to Christianity, and they often did so with brutal force (Stephens, 1998). Cortés took this instruction seriously and as he plundered through the country he insisted local indigenous populations to erect crosses and shrines to the Virgin in lieu of their idols. For this purpose Cortés brought with him a Franciscan friar, Bartolome de Olmedo and a priest, Juan Diego. One of the key figures in conquering the Aztecs and subsequently converting the local population was La Malinche, a young woman from Tabasco who spoke not only Nahuatl and Maya languages, but also Spanish. La Malinche (also known as Doña Marina) served as Cortés' translator and later bore him a son, Martín. Lenchek (2000) writes that she was a "fervent Christian" and worked hard to convert her people to Catholicism during the early years of the Conquest of Mexico. Between 1519 and 1524 a total of twelve friars arrived in Mexico, with the main aim of converting the indigenous populations to Catholicism. Because the same papal decree deemed that the native population had "souls", many of the "converted" were simply baptized without any follow-up and the Spaniards continued to treat the native population with a mixture of paternal indifference and hostility.

The Rise of the Virgin of Guadalupe

All of this changed after 1531, when the Virgin of Guadalupe first appeared in Tepeyac. According to the legend, Juan Diego, a recently converted indigenous man, was walking in the hills surrounding Tepeyac on the morning of the 9th of December, 1531 when the Virgin Mary approached him on the hillside. It should be noted here that Tepeyac was and continues to be a pilgrimage site for indigenous peoples who wish to honour Tonantzin, the Aztec goddess of fertility and nurturing. Dressed in a long blue-green mantle, the dark-skinned Virgin spoke to Juan Diego in his native Nahuatl and asked that he erect a shrine in her honour. Juan Diego, described as a "poor and humble person with a pure mind", went

directly thereafter to see the Archbishop Juan de Zumárraga, who was rather sceptical of Juan Diego's story and thus demanded proof of the Virgin's apparition. On the following day Juan Diego returned to the hillside and the Virgin reappeared. The next day, December 12th, Juan Diego's uncle fell ill and he walked again in the direction of the hill to find a priest and on his way the Virgin appeared for a third time. She instructed him to pick roses at the top of the hill, despite the fact that it was December and no flowers were in bloom. Juan Diego did so and returned to the Virgin with his tilma (cloak) full of flowers and she rearranged them and instructed him to bring them to the Archbishop. Upon doing so, an image of the Virgin was imprinted on his cloak and his uncle was miraculously healed (Andersson: 71). Naturally, a temple was quickly built at the site of the apparition and the story spread throughout the country. Over time, the original church has been replaced by newer and larger churches (the last one constructed in 1976) and in 1990 Juan Diego was canonized as a saint.

Little by little, the story of the apparition of the Virgin of Guadalupe gained credibility throughout the country and her image became an important new symbol of Mexican identity. The first book published about the Virgin, namely Miguel Sánchez's 1648 *Imagen de la Virgen Maria Madre de Dios de Guadalupe milagrosamente aparecida en la Ciudad de Mexico*, was written more than 100 years after the Virgin's apparition and claimed that Mexicans were the chosen people in the Promised Land (Andersson: 121). Another less-known account of the Virgin's apparition is Luis Laso de la Vega's *Huei tlamalhuicoltic* (Nahuatl: "The Great Happening") which was written in Nahuatl in 1649. Vega's account of the apparition uses a colloquial style, poetic descriptions, and Nahuatl's use of diminutives, thereby lending the text a decidedly un-European feel (Brading: 81-83). In 1629 a series of floods affected the region and the Virgin's image, which was hurriedly carried to the cathedral in a canoe, was said to be responsible for stopping the floods and thus she rose to the status of Patrona Principal in the region and in 1756 she became the Patroness of the entire Viceroyalty. In 1810 Miguel Hidalgo y Costilla, leader of the Mexican independence movement, brought masses of Mexicans together against the Spanish colonial rule, which was crystallized in the infamous Grito de Dolores: "Long Live Our Virgin of Guadalupe! Death to the Spaniards!" (Andersson: 125). Taking into account the popularity of the Virgin amongst Mestizos and Indigenous peoples alike, Mexico's first president even changed his name from José Miguel Ramón Adaucto Fernández y Félix to Guadalupe Victoria. Even the Zapatistas in southern Mexico have adopted her image; an image of the Virgin, known as Guadalupe Tonantzin, has appeared on flags during the Zapatista's demonstrations.

Today, the Virgin's image can be found in a plethora of places in modern-day Mexico such as in taxis, buses, government offices and schools. Mexicans demonstrate their affectionate relationship with her in the numerous diminutive nicknames for her: Lupe, Pita, etc. Every year on the 12th of December Mexicans across the country celebrate her apparition and tens of thousands of Mexicans make the pilgrimage to her shrine near Mexico City. Andersson's dissertation (2000), entitled "The Virgin and the Dead", discusses how the Virgin of Guadalupe has contributed to Mexican nationality and points to six common perceptions of the Virgin in present-day Mexico, namely A) the Mother or Queen of Mexico; B) the maker of miracles; C) the compassionate Mother Mary; D) She who symbolizes unity; E) another version of Tonantzin and F) the Virgin (76-77). Whether the Virgin's syncretic composition was a clever method of the conquistadors to convert indigenous populations to the Catholic belief or whether she is (was) simply a Christian disguise for indigenous peoples to continue honouring their indigenous idols (similar to Voudou in Haiti or Candomble in Brazil) is a debated matter that may well never be agreed upon. However, what is important to note is that she has remained a strong symbol of Mexican identity over centuries, and can be said to be a uniquely Mexican phenomenon.

Day of the Dead in Mexico

Día de los Muertos (Day of the Dead) is another event in Mexico that, like the Virgin of Guadalupe, combines Catholic and indigenous symbols in a unique way and, as such, deserves mention here. Essentially, Día de los Muertos is a holiday that provides Mexicans with a portal to communicate with and commemorate the deceased and as such might be considered the country's most popular holiday. It coincides with the Catholic holidays of All Saint's Day and All Soul's Day, which take place at the beginning of November, and is rigorously celebrated throughout the country. The central belief is that on these days it is easier to the souls of the dead to make the journey back to Earth and communicate with the living. For this purpose, Mexicans construct ofrendas (altars) in their homes, on which the favourite foods and beverages are displayed and said to be consumed by the dead (Palfry). Andersson (141) mentions that public ofrendas have been constructed in the past for famous Mexicans like Frida Kahlo or Emiliano Zapata, or for victims of natural disasters, like those who died in the hurricane that hit Oaxaca in 1997.

Preparations for the Day of the Dead commence in mid-October, when families begin to purchase the necessary supplies for the ofrendas, cleaning their homes and clearing away any weeds or roots that may have sprung up over the last year in the graveyard. Around the 31st of October, families construct an elaborate ofrenda in their homes, usually on a table. On this table a combination of the following items can be found: candles, bread shaped in the form of bones, various foods, beverages, cigarettes, pictures of saints, feathers, skulls made of sugar (calaveras) and marigold flowers. In fact, some families also place a bucket of water, soap, towels and a blanket on their ofrendas because they believe that the dead have travelled a great distance and might be in want of a shower and a sleep. Oftentimes the holiday takes on a jovial and relaxed atmosphere, as families tell jokes and anecdotes about the dead, for it is believed that the dead are not only present, but also listening (Andersson: 140-141). The 1st of November, also known as Día de los Angelitos (day of the innocent ones), is believed to be the day when the souls of dead children and infants arrive and commemorate with the living. Later on that evening the deceased adults arrive and partake in the ofrenda's offerings. On the night of the 2nd the dead accompany their families to the graveyard, where the tombstones (panteones) are decorated with marigold flowers and candles. The families stay in the graveyard, oftentimes playing instruments and telling stories, usually until dawn when it is believed that the dead return to their world (Slenczka: 58).

"The Mexican," according to the Mexican Nobel prize novelist Octavio Paz, "in contrast, is familiar with death. (He) jokes about it, caresses it, sleeps with it. It is one of his favourite toys and his most steadfast love" (http://thinkexist.com/quotes/octavio_paz/3.html). Indeed, death has always been a central theme in Mexican consciousness. The Aztecs, for example, believed that life and death were two sides of the same coin; they believed that the dead played a vital role in the regeneration of the Earth, which led to the Aztec's strong emphasis on (human) sacrifice and the belief that the dead ancestors were key in determining the fertility of the land and the subsequent well-being of humankind.

It was for this reason that the Aztecs celebrated the dead in a cycle of holidays, the largest of which being the festival of Mictecacihuatl ("The lady of the dead") which was celebrated for an entire month around August (Slenczka: 64). It should be mentioned here that in Aztec believed that upon his or her death, an individual would be sent to one of the following four afterlives: Tonatiuh ichan (for those who died in childbirth, on the battlefield or on the sacrificial altar- these were considered the most noble deaths), Tonacaquauhtitlan (for children that died), Tlalocan (for those who died in natural disasters or drowned), and Mictlan (for everyone else). It can generally be said that the Aztecs held the first three afterlives in a positive light, whereas Mictlan had a somewhat negative tone (Slenczka: 65).

Catholicism in Mexico Today

This Chapter mainly deals with liberation theology in the southern part of Mexico and the reaction of the institutional Catholic church in the whole country. The last part of this chapter will describe the changes caused by Evangelical charismatic churches that became of significant importance mainly in the southern Mexico in the last sixty years.

To recognize the relevance of the Catholic religion in Mexico one must consider the high percentage of Catholics, which is about 89 % (vgl. <http://en.wikipedia.org/wiki/Mexico#Religion>). Mexico has the world's second largest number of Catholics after Brazil. About 6 % of the Mexican population is evangelical. Among the evangelical Christians, the Mormons, the Jehovah's Witnesses and the Seventh-day Adventists have growing numbers.

Through this high number of Christians one can imagine that the Christian faith and the church play an important role in everyday life in Mexico, although Mexico has no official religion and the government is independent from the church.

Liberation Theology

Liberation Theology has a central meaning in Chiapas, the most southern state of Mexico. This is linked up with the addressees of Liberation Theology who are people that suffer because of hunger, malnutrition, illiteracy, and bad medical supply. Although Chiapas has a high amount of mineral resources like oil and a high biodiversity, people are poor. There is a high rate of indigenous people, about 70 %, who are predominantly small-scale farmers or even do not have land to live on (Möller: 14).

This situation has not really changed over the last 500 years. When one of the mentors of Liberation Theology, Bartolomé de las Casas, came to Hispaniola in 1502, the indigenous people were slaves of the European colonialists. In his first years abroad las Casas worked in the colonialist structures of the Catholic Church, but the more he got to know about the situation of the indigenous people, the more he criticized how the Spaniards handled them. Since 1514 he campaigned for the abolishment of slavery.

But he was not totally against the colonization, either. His proposal was to replace the soldiers with monks in order to have a „peaceful colonisation“. In 1543 Bartolomé de las Casas became the first Bishop of Chiapas. He lived in Ciudad Real, the town that since 1844 is named “San Cristóbal de las Casas”. But as he fought for the abolishment of slavery, he refused the absolution to those who did not free their slaves. His opponents reacted by cutting off any financial support to the diocese and so the diocese asked him to leave the town in 1547 (Möller: 10).

About 420 years after that, in the 1960`s, Liberation Theology was founded, mainly through the second council of the Vatican that took place from 1962 to 1965 and the second assembly of the Latin American episcopate in Medellín (Colombia) in 1968. The council of the Vatican set one focus on the “Church of the poor” (Möller: 19) that was then amplified by the Latin American episcopate to an “option for the poor”. This option also implies the “option for the others”. Poor people are in the context of Liberation Theology not only socially infirm persons but also ethnically excluded people. Therefore most churches based on Liberation Theology consist of indigenous people.

One of the Founders of Liberation Theology was the Bishop Samuel Ruiz García, a man who held office in Chiapas from 1960 to 2000 (Möller: 29). He followed in the footsteps of Bartolomé de las Casas through his commitment to indigenous rights. By founding ecclesiastical base communities that strengthen women's rights, medical supply, and self

defence, he followed one main concept of Liberation Theology that is to reach liberation through sensitization by education. Ruiz García did not only ensure that indigenous people got the opportunity to learn reading and writing, but also motivated them to reflect on their situation as oppressed peoples. Therefore he took care that the Bible was translated into indigenous languages such as Tzeltal, Tzotzil, Chol and Tojolabal so that the people could read the Bible themselves and make their own interpretations (Möller: 29). In the 1990s Ruiz García acted as intermediary between the government and the Zapatistas at the negotiations of San Andrés (Möller: 39).

One group that is also involved in the conflict between the Zapatistas and the government are „Las Abejas“ (English: “the bees”). This group of indigenous people consists of about 40 Catholic villages in the Chiapanecan highlands. Since 1997 the administration centre of these villages is the village Acteal, which lies in the north of San Cristóbal de las Casas. Before December 22nd in 1997 Acteal was inhabited by Zapatistas, PRIístas and people that belong to the “pueblo creyente” (English: “the believers”). But on the December 22nd the military and paramilitary troops committed a massacre where 45 people were killed. When the Zapatistas heard rumours of the planning of this massacre they flew into the mountains. But the Christian community stayed praying in the church of Acteal, where some of them were killed (http://en.wikipedia.org/wiki/Acteal_massacre).

The victims of the massacre in Acteal are said to fly all over the world in the form of bees to collect people who get to know about the situation of the indigenous people in Latin America. Therefore the Catholic communities are now called “Las Abejas”.

Reaction of the Institutional Church

The Institutional Catholic church does not support Liberation Theology because they are of the opinion that the believers of Liberation Theology are Marxist and that they only use the Christian religion to legitimize their political commitments (Kruip: 48). The Institutional Catholic church is not willing to change the state of indigenous people. They want to keep the differences yet they are willing to help the helpless and give support to the poor. But the opinion of the Institutional Catholic church is that the Europeans do not live on exploitation (dependency theory) but rather on deeds of good work (development theory) and so they do not want the indigenous people to get a better state because they have to learn to do good work before they receive their earnings (Kruip: 51). The Institutional Catholic church is dominantly led by office holders with European origin. Furthermore, important conferences concerning the situation of Latin America are often held in Europe. Because of this one could say that the behaviour of the exponents of the Catholic church towards the indigenous in Latin America is mimics the behaviour of the Spanish conquistadors towards the Aztecs.

Evangelical charismatic Churches

In the last sixty years especially in the south of Mexico many people converted and became part of Evangelical charismatic churches. The basis of belief of these churches is the literal interpretation of the Bible, the bodily resurrection of Christ, “The second coming” of Christ on Earth and the personal rebirth because Jesus died for their sins. With these contents these churches mainly attract poor people and as the indigenous people in Chiapas are very poor they are not only the addressees of Liberation Theology but also of Evangelical charismatic churches, as well. But in contrast to Liberation Theology these churches do not want the people to become independent and self-determined but rather to gear their lives on their faith and live for God. Earthly poorness should be conquered by a strict and godly

lifestyle. In these churches symbols like frankincense, candles, alcohol and idols like the Guadalupe are forbidden (Möller: 59). Leaders of Evangelical charismatic Churches translated the Bible in Mayan languages and gave alphabetization courses. The translation of the New Testament in Tzeltal was already completed in 1954 (Möller:58).

Through the conversion in Chiapas the number of Catholic Christians dropped to 70%. Until 1994 one third of the Tzeltales were converted. But the Tzozilles did not convert that much. In San Juan Chamula, a Chipanecan village next to San Cristóbal de las Casas, converted Tzoziles were banished out of the village (Möller: 60 f.).

Conclusion

Although Mexico and especially Chiapas played an important role for the Liberation Theology through the affects of Bartolomé de las Casas and Samuel Ruiz García, Liberation Theology plays only a small role in Chiapanecan everyday life today. Also the officiating Bishop of Chiapas, Felipe Arismendi, is more geared to the position of the Institutional Church.

But the situation of the indigenous people did not change and because of that it remains to be seen if the rising Evangelical charismatic churches will find an earthly solution for the conflict in Chiapas or if the Institutional Catholic church will change its course to reach the indigenous people again.

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http://en.wikipedia.org/wiki/Azteal_massacre

Plan Puebla – Panama and other other efforts to modernize Mexican agriculture

Arnd Zschocke

Introduction

This paper is intended to give a brief overview over efforts to modernize Mexico's agriculture. A first example is the "green revolution" of the 1940s, which is presented with its short and long term effects. The second part focuses on the Plan-Puebla-Panama as a mega-project to develop Mexico's southern regions. The Plan's goals and intended ways to achieve them are contrasted with common arguments against it. In the end a conclusion is drawn and some questions are asked for the reader to think about and maybe draw his/her own conclusion during and after our excursion to southern Mexico.

History

The development of agriculture in Mexico is very strongly linked to land rights and land distribution which are very political issues and throughout the history of Mexico always were reasons for conflicts and revolutions.

In times when the land was/is owned only by a few wealthy landowners and cultivated by their slaves/laborers there were/are usually bigger plots and more capital available for a systematic increase of the efficiency through mechanization and the use of external inputs. If modernization is understood as such an increase in labor efficiency then the modernization of Mexico's agriculture mainly took place in times and regions where the land was only owned by a few.

The Green Revolution

After the Mexican revolution and World War II Mexico was faced with a situation of a growing population (especially in the urban areas) and an insufficient national supply of staples, especially wheat.

At the request of the Mexican government the Rockefeller and Ford Foundations financed a research program starting in 1944 which was mainly carried out by North-American scientists to improve the productivity of Mexican agriculture. The efforts were focused on four major areas:

- Irrigations systems: The building of dams and big irrigation channels made it possible to cultivate crops in arid regions and thus extend the agricultural area especially in the dry northern regions of Mexico.
- Synthetic fertilizers: The large scale introduction of synthetic fertilizers into Mexican agriculture increased yields and promoted plant growth also in poor soils.
- Synthetic plant protection agents: The introduction of synthetic pesticides, herbicides and fungicides reduced the loss of crops through these hazards.
- Breeding technology: Through modern breeding technologies HYVs (high yielding varieties) were developed. The focus was on wheat and to some extent on corn. Some improvements were higher nitrogen uptake, lower stems, disease resistance and increased yield through hybridization.

The most prominent North-American scientist involved with the breeding program was Norman Borlaug, the father of the "Green Revolution", who later won a Nobel Peace Prize for his work. Out of the initial Office of Special Studies in 1963 the CIMMYT (the International Center for the Improvement of Corn and Wheat) was formed which was the first international agricultural research institution and in a way lay the foundations of the CGIAR (Consultative Group on International Agricultural Research) which was established in 1971.

Short and mid-term effects

The effects of the "Green Revolution" in Mexico especially for the production of wheat are impressive and led to efforts to copy the methods worldwide. From an importer of wheat (1943 half of the consumed wheat was imported) Mexico became an exporter (1964 0.5 Mio t were exported). The wheat yield was increased from 750kg/ha in 1950 to 3200kg/ha in 1970. The big irrigation projects more than doubled the irrigated area from 1.5 Mio ha in 1950 to 3.5 Mio ha in 1965.

Long term effects

There are critics of the "Green Revolution" who state that there are also negative environmental and social long term effects of the introduction of modern agriculture in Mexico and other countries:

- Improper irrigation system can lead to the salinization, erosion and subsequent desertification (In Mexico 384,163 ha in a total drained area of 5,203,346 ha are in a state of salinization)
- The energy efficiency (calories put into production / calories harvested) of the modern production methods is not better and often worse than that of traditional agriculture which is mainly owed to the high amount of energy put into the production of synthetic fertilizers and plant protection agents.
- Agrochemicals and monocultures are a threat to natural ecosystems and a health risk for farmers and consumers – the dietary diversity is also reduced.
- Most of the intensively produced crops are cash crops for export. In Mexico crops from irrigated fields account for 70% of the agricultural exports and although being the origin of corn cultivation Mexico has to import almost half of its corn.
- The social effects are very complex but can be summarized in a growing inequality between the big landowners and the smallholders or landless laborers and a growing dependence on the providers of inputs on the one hand and international markets on the other.

Unequal regional development

As discussed previously the agricultural development in Mexico advanced much faster in the north, where the ownership structure of the land is characterized by the predominance of large scale landowners who produce cash crops for the (international) market. In the rural south of Mexico there are much more smallholders, and the ownership is characterized by a predominance of communal ownership (ejido system). Extreme poverty (defined by insufficient dietary intake) is at a percentage of 47% among the southern Mexican population while in the north it is at 12%.

This is often also attributed to the lower agricultural production of the smallholders in the south. Table 1 shows the threefold difference in corn yields between large scale commercial and small scale farms in Mexico.

This uneven development has been identified and especially the South has been the subject of different governmental development projects like PROCAMPO, a direct cash transfer program or ALIANZA, a matching grants program for investments in the modernization of agriculture.

Plan Puebla-Panama

The Plan Puebla-Panama (in the following called PPP) is a joint international (the Central American countries plus Mexico) programme to develop and integrate the Central American region from the city of Puebla in Mexico down to Panama.

Rationale of the Plan

The PPP was first announced by Mexican President Vicente Fox on March 12, 2001 and officially launched during a Central American summit conference in El Salvador on June 15, 2001.

The overall goal was to improve living conditions for the population and the initial objectives were:

1. Human / Social development
2. Participation of the civil society
3. Structural change of the economic dynamics in the region
4. Usage of comparative advantages
5. Promotion of productive investments
6. Sustainable natural resource management
7. Consolidation of joint plans and strategies between the Central American countries
8. Modernization and strengthening of institutions.

It included the nine southern states of Mexico as seen in Figure 1 and the Central American Countries with Colombia joining later.

Components of the Plan

To reach the objectives eight areas were identified where cooperation between the partners would be needed to implement projects. Each work area was assigned to one partner country to coordinate which were:

1. Energy Sector Integration (Guatemala)
2. Transportation Integration (Costa Rica)
3. Telecommunications Integration (El Salvador)
4. Trade Facilitation (Honduras)
5. Sustainable Development (Nicaragua)
6. Human Development (Mexico)
7. Tourism (Belize)
8. Disaster Prevention and Mitigation (Panama)

To work together on these topics the partners organized themselves along two main axes: Human Development and Productive Integration.

When Colombia joined in 2006 it became responsible for the topic of biofuels and took over tourism from Belize which in turn became responsible for climate change matters.

Additionally an executive commission (CE), an inter institutional technical advisory group (GTI) and a commission for promoting and securing funds for the projects were formed. After a 2004 summit in Managua, Nicaragua, an executive directorate in San Salvador, El Salvador was established.

At a meeting in Villahermosa, Mexico in June 2008 the PPP was renamed to "Proyecto de Integración y Desarrollo de Mesoamérica (Proyecto Mesoamérica)".

Development of the Plan

Due to some criticism the PPP developed slowly but nonetheless until 2008 projects with a joint value of over 8 bil US\$ were financed. The priorities of the spending are such: transportation, 85.2%; electrical, 11.1%, tourism, 1.3%, human development, 0.8%, disasters, 0.7%, trade, 0.6%, sustainable Development, 0.4%; and telecommunications, 0.03%.

In the transportation sector a special focus I laid on inter-oceanic corridors between the Pacific in the west and the Caribbean or Gulf of Mexico in the east. The projects include roads and highways as well as port facilities.

The energy integration is mainly focused on projects to connect the different national grids and this way also connecting Central America to the North American grid. In the first phase of the PPP there were also several big hydroelectric dam projects planned, which were dropped after public criticisms. Also the development of Biofuels is focused.

The telecommunication part of the PPP is mainly about submarine fiber optic connections and fiber optic cables bundled to the main electrical grid to connect the region to a "Central American Information Highway" Autopista Mesoamericana de la Información (AMI).

In the other sectors it is mainly administrative projects of less cost for new infrastructure.

Criticism of the Plan

From the beginning on the PPP was heavily criticized by social movements and indigenous people.

- One concern are the big hydroelectric dams, which would mean the displacement of many people and the destruction of important ecosystems.
- Another concern is that the economic integration will attract investors which would buy up the land and start industries which would exploit the people and natural resources.
- The critics also opposed the establishment of a Central American corridor of nature reserves and protected areas, because they fear that local population will be displaced while multinational investors profit from the screening and sourcing of potentially valuable plant material and biodiversity.
- The main complaint is that decisions are made without participation of the affected population and that there is a bias favoring cooperate investment which many feel will only benefit the wealthy and drain resources from the region.

Conclusion

The green revolution and agricultural development brought tremendous increases in yields and revenues especially to northern Mexico, while in the long term it contributed to the degradation of the soil and other environmental problems. It also did not solve but rather

contributed towards social inequality. Also the integration of markets with the NAFTA-agreement brought benefits only to a few. That is why a wider public is very skeptical about similar projects like the Plan Puebla Panama, to develop the poor southern states of Mexico. The assessment of social and environmental impacts of such mega projects is often done only very superficially because the economic goals are in focus. Often the affected people do not profit from such developments (or only for a short time). That is why participation is important on every level.

The questions the reader should think about and investigate are:

Is participation on every level possible for such big projects?

What is agricultural development and does it mean the same for all stakeholders?

Who gains and who loses in the process of modernization?

Is there a way to achieve a win – win situation or will somebody always have to lose?

Maybe the trip to Mexico will bring us closer to find some answers to this question.

Some further reading

Website of the PPP and Proyecto Mesoamerica: <http://www.planpuebla-panama.org>

Archive of Global Protests PPP site:
<http://www.nadir.org/nadir/initiativ/agp/free/colombia/puebla/>

CIEPAC page on the PPP: <http://www.ciepac.org/archivo/ppp.htm>

The 'Ejido' system and the perpetual question of land property rights

Heike Pannwitt & Julian OPlagemann

The year 1992 was a historical turn around in the Mexican agriculture. The article 27 which was the main achievement of the Mexican revolution of 1910 was reformed.

The system of the Ejidos in Mexico means landownership by agricultural communes. And has its roots in pre-Columbian time. The question of Land property rights was one of the central themes in the Mexican history. During the 19th and 20th century farmers and Indian communes were fighting for a piece of land to live. The central point of the Mexican Revolution was reestablishing land property rights which they lost by the liberal agricultural politic in the 19th century. Before the revolution of 1910, 92% of the rural population were landless and only 1% controlled 97% of the arable land.

By the Mexican Revolution the constitution of 1917 includes the article 27 which contains three forms of landownership: national, communal and private property. "La tierra a quien la trabaja" (The land to the people who cultivate it!), as one slogan of the revolution. So ejidos were founded by groups of landless farmers mostly in the 1920-1960th. So the government disappropriated great land owners for compensation. At first the progress was very slow but in 1970 43% of the arable land was distributed to 66% of the rural population. In 1991 29.951 Ejidatorios were cultivating 102.876.789ha what correlates 53% of the national agricultural area. But ejido also created two classes, 1/3 of the Mexicans were authorized and 2/3 was not.

How does an ejido exactly work? It consists of 2 unequal parts, the bigger one is called Allmende and the smaller ones are parcels. Each member of the ejido has the individual land use rights for his own parcel. This right is only transferable by inheritance. Therefore this member is called Ejidatario. An Ejidatario cultivate his parcel for his own benefit and is registrate in the Registro Agrario Nacional, R.A.N. The Allmende as the bigger part of the ejidoland is a common used property. Mostly the Allmende consists of wood or pasture. The sense of the common shared land is that even landless people are allowed to cultivate a part of the Allmende after the meeting of the ejido accepted the application of the landless that is now called cumero/-a. Every third year there will be an election of a leader of the ejido. This leader has the task to concern about the problems in the Ejido.

The reason for the turn around in the agricultural politic was the inefficient constitution of the Ejidos. Almost the whole production is produced for subsistence. An example for the inefficiency is that only 3700 working tractors are used on over 100 mill. ha. of land. So most of the work is still done by hand.

The follows of the reformed article 27 are the division of the one land title to two different owner titles. With the new tiles it is now possible to transfer each separately. The ejidatario becomes the private owner of his parcel and is able to sell his land. At the same time the ejidatario will be a co-owner of the Allmende. This ownership is also transferable.

The fundamental characteristics of the new constitution should be the same but that's not clear. With the reformed article it is still not allowed to sell the Allmende. But every Ejido has the right to divide the Allmende in pieces and assign it to the ejidatarios. This assignment is possible with or without reward and this is nothing else than an act of purchase. Another point is the prohibition of execution. But the right of use of parts of the Allmende is transferable to companies by leasehold; accept a guarantee or a hypothecary credit. This means in case of insolvency a temporal distress. As another point is the non-transferability obtained. The new law permits the transfer of the right of ownership and use by lease. It

makes sure that the lessor has the purchase option in case of insolvency. This fact has the consequence that even non-ejidatarios have the right to buy land from an ejido. In the old law the Allmende was indivisible which the basic of an Ejido was. With this law it was possible to integrate landless by give them a piece of the Allmende to cultivate and get the change to become a member of the Ejido. In summary with the article 27 the ejido becomes divisible, seizable, marketable, transferable and individual classifiable. So the aim of the reformed law is the elimination of the ejido and the new philosophy seems to be that people eat what is cheap and not what they harvest by themselves.

The consequences of the realization of the new law by the Procede will be shown in one example. The ejido Sayula is laying 100 km south of Guadalajara and consists of 112 members in 1998. Through the program for privatization (Procede) it came to fraud and murder and land robbery like that some parcel became smaller by the land surveying. All in all more land is leased then sold most of them are lease to so called Agromaquilas which are big companies. The decision whether the land will be leased or not depends from its ecological quality like erosion or the lake of water. Finally the Procede produced a lot of problems in the ejido Sayula since 1993. Some of them are the defalcation of the ejido cash box from wood sell, the unequal division of the Allmende, land robbery which concerned 30 of 112 ejidatarios and another point is the arbitrary decision of the allocation of the land title.

As it is shown with the example Sayula the the reformed article 27 induced land conflicts and and has the aim to distinguish the ejido to make the Mexican agriculture more efficient. But the problem is the way of the turnaround which creates corruption and social injustice.

The massacre of Tlatelolco and the 1968 movement

Sabrina Leupolt

Introduction

In October the 2, in 1968, the government of Mexico killed 300 – 400 student protesters in Mexico City. The massacre of Tlatelolco was the climax of the political and social protests in Mexico City during the summer of 1968. The protestors were students questioning and criticising the authoritarian, paternal and centralized state.

The massacre of Tlatelolco

Tlatelolco is a district of Mexico City and a symbol for modern conflicts and catastrophes. Because in October the 2 in 1968 the horrible massacre took place on the Plaza de Las Tres Culturas of Tlatelolco. The Aztec Pyramid, the Spanish Templo de Santiago and the building of the ancient office for foreign matters represent this place. To look away of the cultural beau the focus should be on the massacre which occurred on this place. The day of the massacre was affected by student protest and violent clash of students and police. Students and other people demonstrated, collected on the place and had a plenum. Suddenly there was a shot, probably of the secret policy. Consequently the force broke out. There was no escape for the people to flee because of surrounding by the police. As a result 300-400 demonstrators were killed and hundred persons were kept by the police and military of the government.

Participants of the protest

Participants of the protest were intellectual people, teachers, workers and mainly students of the Universidad Nacional Autonoma de Mexico (UNAM). The UNAM is the biggest university of Latin America and involved in numerous uprisings.

Reasons for the massacre and the 1968 movement

The motives for demonstrating and the reasons for the movement of 1968 could find in the political background of Mexico. Mexico was in this period a very authoritarian state. October the 2 1968 was not the first day of protest because there were also other social protests, strikes and labour movements as well in the 1950s and 1960s because of dissatisfaction with the government. The demonstrators criticized the political trend in view of the economic growth. Because the government spend more money for industry and banking than for needs of the Mexican people. Even financial corruption occurred commonly. Low wages was another driving power for the people to go in the streets and to demonstrate for their rights. Furthermore the participants of the protest criticized also the bad justice and the paramilitary and military violence in their state. And the aims were better human and equal rights and social standards.

As well the changes in youth culture, modernity and popular music created a new fair political awareness. Also other movements from other continents and countries inspired the young people to demonstrate against their government. The students were intensely inspired

of the Cuban Revolution, Fidel Castro and Che Guevara. The Cuban Revolution from 1953 to 1959 was the downfall of the Cuban dictator Fulgencio Batista and there was a new beginning for the regime headed by Fidel Castro. With a rebellious policy Fidel fought along with Che Guevara for human rights and social reforms.

Olympic Games in Mexico

Another important event should be put in the context with the massacre that is the Olympic Games in 1968 which took place only 10 days after the massacre. Mexico was the first nation to host the Olympic Games in a developing country. Consequently Mexico would present itself as a modern country, so the government let built a new metro and a new stadium and other investments. The fact is that the Mexican people did not accept the high capital expenditures for the Games. So the Olympic Games were also the reason for the Mexicans to go in the street for demonstrating. Because the governmental expense for the Games contributed to the dissatisfaction with the state. Due to the fact that the eyes of the world were upon Mexico, the country which hosted the Olympic Games, the president Diaz Ordaz and the other members of his government desperately needed to gain control of an increasingly embarrassing situation. It seemed that the massacre, carried out by governmental policy, had a controlling function to stop the revolts and demonstrations. And furthermore to control and stop the apparent danger based on human population which could prevent and manipulate the Games. It was bizarre that the opening of the Olympic Games occurred as nothing had happened the days before. There was no solidarity of the sportsman and politicians with the sacrifices of the massacre.

Government and presidency

The massacre took place under the government of Gustavo Diaz Ordaz, who was president of Mexico from 1964 till 1970 and belonged to the PRI. The government described itself as a modern state, but to see behind the curtain an authoritarian, corrupt and manipulating state dominated which impinging upon human rights and ignoring social standard. Someone was the guarantor for the massacre and to shift the blame on others the government payed newspapers to tell lies and to spread that the students begun to shot and not the policy. The newspapers wrote wrongly that only 29 protestors were killed and not as is generally known 300-400 people. The trouble was that the government did not guilt out for the massacre. Therefore the clearing of the crime was still insufficient.

Man in charge

Only after about 30 years later the man of charge was discovered. The responsible person for the massacre was Luis Echeverria. Luis Echeverria was the Interior Minister of Diaz Ordaz and the president after Diaz Ordaz from 1970 till 1976. Echeverria was captured but released of prison because the crime is time-barred.

The importance in 1968 and after 40 years

The massacre of Tlatelolco and the 1968 movement were classified as a point of inflexion in Mexico. The repressive past, the authoritarian power structure and the fights for rights of students, workers and peasants in Mexico belong to the past. So why to be engaged in Mexico 68? The revolt of students, the movement of 1968 in Mexico was a symbol for the

beginning of demography. The movement was affected by internationalism, by the feeling to be a part of the global connectivity. A lot of activities like the civil rights movement and the student activism characterise new forms of protest, in Mexico and even elsewhere. Spain, Italy and Japan were put in political crisis by mobilisation of students and workers. In Germany the year 1968 is perceived as a second foundation of the BRD after the formal foundation in 1949, added with democratically consciousness of citizens. 1968 was also an upraise in art and culture, thus an unpolitical youth revolt which afforded a multiplicity of lifestyles and the freedom to choose any lifestyle. Did the youthful ardour effect a change in awareness and a focus on the problems in the own country? There was no abrupt modification to democracy after the movement of 1968. On the contrary repression, hectoring and militarization still existed in Mexico. Of course after the massacre the students were charged with emotions. Some were disappointed, afraid and awed and other were angry and not ready to capitulate but ready to fight further for their rights. The president of Mexico from 2000 till 2006, Vicente Fox, seemed to be a certain glimmer of hope because he belonged not to the PRI party but to the PAN party. This means an important political change for Mexico. Fox promised democratic liberties and justice but his administration disappointed because a new justice reform did not exist. Nevertheless 1968 can also be currently an inspiration for democratisation, protests and resistance. The examination with 68 can help to repeat not the same mistakes. Aspects at that time are still important for example allowances and moulds of doing politics.

Summary

In 1968 Mexico did appear to be on the brink of entering the modern world with the games, the economy and a vibrant culture life. But already in July young men and women rioted in the streets and demanded political change. „Solution to the problem, not repression. Dialogue yes, bayonets no!“ This quotation from the book “Plaza of Sacrifices” show the appeal of the people and their desire for better social rights. The massacre of Tlatelolco had profound effects on association and culture. Violation of human rights had happened. The senate had declared October the 2 for national commemoration day.

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The Chinampas of the Valley of Mexico

Jonas Hagmann

What are chinampas, the so called “floating gardens”?

The name chinampa derives from two words of the Aztec language Nahuatl: chinánitl, meaning “an enclosed bed surrounded by cane or stakes” or “net of branches” and pan, meaning “on or above the surface” (Frederick 2007). Thus, the name describes somewhat how chinampas were built and what they look like: mostly rectangular, narrow artificial islands in swamps or shallow lakes, surrounded by canals with water (Table 12) (Lumsden et al. 1987; Zuria and Gates 2006). Hence, Chinampas are a form of wetland or irrigated agriculture (Jiménez-Osornio and Gomez-Pompa 1991; O’Mack 1991). Their surface is at about 25 to 100 cm above the water level (Crossley 2004) and initially they had an area of about 500 to 1,000 m² (Mireles et al. 2004).



Table 12: Aerial view of the Chinampas of Xochimilco, Mexico City.

Source: <http://homepage.mac.com/helipilot/.Pictures/vistasaaereas/Xochimilco.jpg>, 12.01.2009.

Although the chinampas are often referred to as “floating gardens” the chinampas themselves never really floated. Therefore, the seedbeds (almácigos), in which the seedlings were grown until planted on the chinampa, were the only floating garden. Those seedbeds were actually floating woven mats of dead reed, covered with muck from the lake (O’Mack 1991). Nowadays, the seedbeds are prepared on the chinampas. The mud is dried and cut into cubes. With the finger a hole is made in the cubes, where the seeds are put in (Crossley

2004). The almácigo was covered with mulch or a mat, thus protected against heavy rains, sun and frost (O'Mack 1991).

The materials used for construction were lake sediments, aquatic vegetation, and imported materials such as earth, sods, turf, branches etc. (Siemens 2004). It is known that there existed different ways to construct a chinampa (Frederick 2007). In shallow lakes, for example, an underwater fence was built and filled with the building materials (Onofre 2005) or sods were piled up until they reached the water surface and then covered with mud (O'Mack 1991). In swamps, the soil from the trenches that were dug around the fields was thrown on the plots to raise them over the water level (O'Mack 1991). Also, imported building materials were used if the chinampas were not high enough (Lumsden et al. 1987) or soil from old chinampas that had risen too high was applied (Frederick 2007).

There is not much archaeological knowledge about the chinampa system (O'Mack 1991; Frederick 2007). Thus, there are many different figures given in the literature for when the chinampas were introduced in the Valley of Mexico. Jiménez-Osornio (1990) writes about 3,500 years before present, supported by Wirth (1997) who mentions 3,000 years. Others cite 2,000 years (Matheny and Gurr 1983; Lumsden et al. 1987) whereas Onofre (2005) sets the date at 1265 of our time, surely referring to the expansion of the already existing chinampas during the rule of the Aztecs (Losada et al. 1998).

Yet, it is widely recognized that chinampa agriculture was the key to the growth of population and political power in the Valley of Mexico (Jiménez-Osornio and Gomez-Pompa 1991; O'Mack 1991; Wirth 1997; Losada et al. 1998). The expansion of the Aztec empire corresponds with the expansion of chinampa agriculture in the Late Aztec phase from 1350 to 1520 of our time (Wirth 1997; Arco and Abrams 2006).

Background

To understand the importance of the chinampa agricultural system for the Aztec empire, knowledge of the environmental circumstances under which the system was established is necessary.

The Valley of Mexico is a closed basin formed by mainly extinct volcanoes (Wirth 1997) of up to 3,880 m above sea level (Torres-Lima et al. 2000). The surface of the valley lies between 2,000 (Smith and Tolstoy 1981) and 2,500 m above sea level (Losada et al. 1998; Torres-Lima et al. 2000). The climate in the Valley of Mexico is not uniform. After Losada et al. (1998) it is temperate humid in the south and temperate dry in the centre and the north, with permanent snow in the mountains. Torres-Lima et al. (2000) classify it as temperate, Matheny and Gurr (1983) as semi-arid. According to Table 13, at least the current climate in Mexico City must be classified as semi-arid or sub-humid with only little or no rainfall from November until April. During the middle of the rainy period from May until October, a drought of several weeks may occasionally occur (Smith and Tolstoy 1981). The annual rainfall ranges between 100 and 1,400 mm (Torres-Lima et al. 2000) and the mean annual temperature is 15 °C (Jiménez-Osornio and Gomez-Pompa 1991), respectively it ranges between 18 and 24 °C (Torres-Lima et al. 2000). The restrictive factor for crop production is the date of the last killing frost in the spring and the first killing frost in the fall (Smith and Tolstoy 1981).

The main soil types found in the basin are litosoles, andosoles, faeozems, regosoles and solonchaks (Torres-Lima et al. 2000). The natural vegetation consists principally of pine forests and in higher altitudes grassland (Losada et al. 1998).

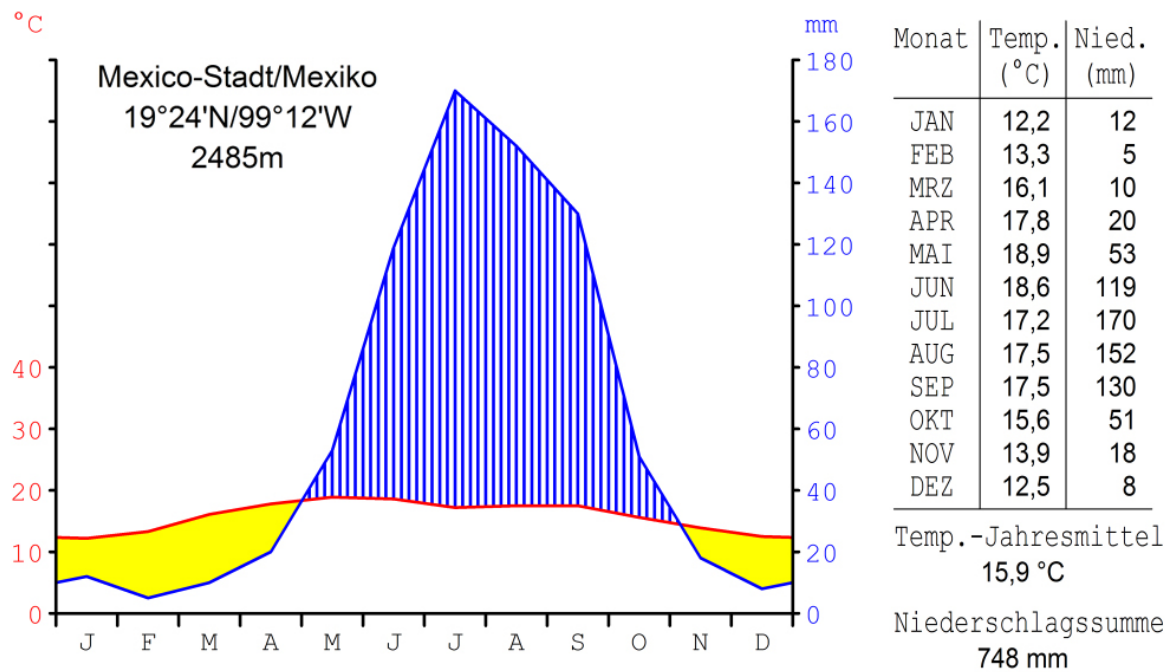


Table 13: Climate diagram of Mexico City.

Source (modified): <http://upload.wikimedia.org/wikipedia/commons/1/1e/Klimadiagramm-metrisch-deutsch-Mexico-Stadt.Mexiko.png>, 24.12.2008.

In pre-Hispanic times, the floor of the basin was covered by an interconnected system of shallow lakes (up to three meters deep) and swamps, covering about 800 to 1,000 km² (Table 14) (Wirth 1997). Fresh water came from several springs on the southern boundaries as well as rivers and streams from the east and the west. In the dry winter, evaporation reduced the level of the lake, so that five (four) independent lakes were formed (Johnston 1970; Arco and Abrams 2006). From the north to the south those were Lake Zupango, Lake Xaltocan, Lake Texcoco, Lake Xochimilco and Lake Chalco, the latter two not separated by land, thus a single water body (Lake Chalco-Xochimilco) even in the winter (Arco and Abrams 2006). However, the lakes were no open water bodies but covered by a thick layer of aquatic plants (O'Mack 1991; Arco and Abrams 2006). Furthermore, due to the missing drainage of the basin, the lakes were quite saline, especially the big Lake Texcoco, because it was the deepest and somewhat lower than the others (O'Mack 1991). The figure given by Humboldt for Lake Texcoco is 2.5 to 3.0% of dissolved salts which almost reaches the content of open ocean salt-water of 3.3 to 3.75% (Johnston 1970). Yet, Lake Chalco-Xochimilco was fed by fresh water springs in the south, therefore its water being much less saline. Consequently, the most important chinampa zones could be found there (Johnston 1970; O'Mack 1991). Table 14 gives an overview of what the Valley of Mexico might have looked like just before the conquest of the Aztec capital Tenochtitlán by the Spanish.



Table 14: Map of the Valley of Mexico short before the arrival of the Spanish conquerers.

Source: http://sidewalksprouts.files.wordpress.com/2008/04/lake_textcoco ..., 12.01.2009.

The Aztec capital Tenochtitlán was built on an island in the western part of Lake Texcoco that usually fell dry in the winter (O'Mack 1991). The natural space on the island for agriculture was very limited (Johnston 1970) and food production not sufficient for the population of Tenochtitlán, which is estimated to have counted about 250,000 heads at the arrival of the Spanish in 1521 (Torres-Lima et al. 1994). Moreover, the Aztecs entirely relied on human portage or manually powered boats for transporting food, because they lacked the wheel as well as domestic animals for haulage, thus making proximity of the agricultural production area to the population of the capital a key factor (Wirth 1997). Yet, not only the agricultural land on the island was naturally limited, but also the total land suitable for crop production in the basin was (is) restricted due to climatic factors. O'Mack (1991) states: "Since the basin floor and the lakes lie at about 2,240 m elevation, and since the maximum elevation at which there is sufficiently long growing season for maize is about 2,700 m elevation, the total area of dry land available for maize agriculture in the basin is fairly restricted. Agricultural production is further restricted by the unpredictable onset of the rainy season, sometimes delayed until well into the frost-free season for much of the basin, making irrigated agriculture especially attractive because planting with irrigation can begin at the very start of the frost-free season whether or not the rains have started" (O'Mack 1991: 93).

Archeologically, nothing is known about the chinampa system of the Aztec capital Tenochtitlan, because Mexico City is literally built upon it. Nevertheless, it surely was a chinampa city but still, Lake Chalco-Xochimilco was the main source for staple foods (O'Mack 1991). Chinampas occupied thousands of hectares in the Basin of Mexico (Lopez-Recendez 2003; Zuria and Gates 2006) and alone in Lake Xochimilco the pre-Hispanic chinampas covered some 120 km² (Wirth 1997).

A problem for chinampa agriculture was the saline water of Lake Texcoco, because when the summer rains came and the five lakes merged, the salty waters of Lake Texcoco would flood the chinampa gardens around Tenochtitlán and in Lake Chalco-Xochimilco (Johnston 1970). This problem of saline water from Lake Texcoco was solved by the construction of the Dike of Nezahualcoyotl in the fifteenth century (O'Mack 1991). This dike extended approximately 16 km across the lake from the north to the south (Table 14) and sealed off the chinampas from the rest of Lake Texcoco, leaving them in a freshwater lagoon (Johnston 1970; Smith and Tolstoy 1981; Onofre 2005). Yet, this huge dike was not the only one built by the Aztecs. They also constructed a variety of smaller dikes used for water regulation and over water access to their capital, allowing the control of water levels to prevent seasonal flooding and careful regulation of soil moisture on a year round basis (Smith and Tolstoy 1981; Wirth 1997; Lopez-Recendez 2003).

Productivity

Crop yields in the chinampas are higher than in many of the modern agricultural systems in Mexico (Jiménez-Osornio and Gomez-Pompa 1991). In the mid 1950s, for example, maize yields from chinampas of 3.5 to 6.3 t ha⁻¹ were quantified, being the highest long-term yields achieved anywhere in Mexico up to that time. The average maize yields in the USA in 1955 were 2.6 t ha⁻¹, and did not pass the 4 t ha⁻¹ mark until 1965 (Altieri 1999). In addition, figures of three flower yields and five or six radish (*Raphanus sativus* ssp. *sativus* L.) or purslane (*Claytonia perfoliata* Donn ex Willd.) yields per year are cited in the literature (Torres-Lima et al. 2000). Matheny and Gurr (1983) even write about up to seven harvests per year of different crops from a single plot. Yet, it does not become clear how these data were obtained. Nevertheless, the chinampa agricultural system is considered to be one of the most productive agro-ecosystem ever (Lumsden et al. 1987; Jiménez-Osornio and Gomez-Pompa 1991; Puig 1994). Table 15 shows intensive vegetable production on a modern chinampa in Xochimilco.



Table 15: Intensive vegetable production on modern chinampas.

Source: <http://www.mexiko-lexikon.de/mexiko/images/7/7c/Chinampas2.jpg>, 22.

Those high levels of productivity result from several factors:

Water availability

There is plenty of water available throughout the year for the growing crop, even if there have been no rains (Altieri 1999). The surrounding canals, ditches and trenches drain and irrigate the fields (Lumsden et al. 1987) and also store the water (Siemens 2004). Natural sub-irrigation by infiltration from the side is possible under certain combinations of field morphology, crop type, and soil properties (Crossley 2004; Zuria and Gates 2006). Yet, manual irrigation by bucket as well as irrigation by hoses connected to gasoline-powered pumps have been common practices on chinampas (O'Mack 1991; Crossley 2004; Zuria and Gates 2006).

Soil fertility

Chinampa soils maintain a high level of soil fertility despite the continual harvest of crops because they are supplied with high quantities of organic fertilizers such as aquatic plants, canal mud, crop residues, weeds, animal manure and muddy water (for irrigation) (Altieri 1999; Juárez-Figueroa et al. 2003). Originally, also human excrements were widely used and composted for fertilization. Mulching with water vegetation against heat and cold was and is a common practice (O'Mack 1991). Table 16 5 shows modern chinampa farmers throwing aquatic vegetation on a chinampa.



Table 16: Modern chinampa farmers throw aquatic vegetation on a chinampa.

Source: <http://www.moplants.com/blog/wp-content/uploads/2007/08/chinampa%20farmers.jpg>, 12.01.2009.

The high content of soil organic matter of the chinampa soils is largely recognized, contributing to soil fertility and plant health (Lumsden et al. 1987; Altieri 2000; Crossley 2004). Especially the suppression of plant parasitic nematodes by chinampa soils compared to sterilized chinampa soils or other soils has been studied and proven by several authors, concluding that the high content in soil organic matter enhances biological soil activity and thus antagonists of soil born pathogens such as plant parasitic nematodes (Lumsden et al. 1987; Zuckerman et al. 1989; Chen et al. 2000).

The chinampa soils analyzed by Crossley (2004) showed that their mineral grains in general are primarily derived from weathered lava fragments and redeposited volcanic ash, well known as fertile parent material. The soil texture was consistently fine, with very fine sands

and coarse to fine silt dominant in each sample. Lumsden et al. (1987) found a high macro nutrient content, cation exchange capacity and water retention capacity in a chinampa soil.

- “Floating gardens” – the almácigos (seedbeds)

Based on those seedbeds, cropping on the chinampas is nearly continuous; only rarely is the chinampa left without a crop (Altieri 1999). On the chinampas, several crops of different kinds at different stages of growth can be found, with a range of almácigos preparing the next rounds of each crop to replace the others immediately after harvest (O´Mack 1991).

- Biodiversity

The chinampa system is the biologically richest agro-ecosystem known today (Jiménez-Osornio and Gomez-Pompa 1991; Torres-Lima et al. 2000). In one region of Xochimilco, 146 plant species, belonging to 36 angiosperm families were found. The chinampa system provides an excellent example of an efficient and self-sustaining agricultural system in which stability and sustainability are based on, and productivity is enhanced by management and maintenance of the high level of biodiversity in space and time (Jiménez-Osornio and Gomez-Pompa 1991). Already during the Aztec rule the system included sophisticated methods of cultivation such as multiple cropping and crop rotation (Torres-Lima et al. 1994).

During the pre-Hispanic Aztec period aquatic plants were very important for the diet and also included non-cultivated plants collected from borders of the chinampas (González-Jácome 2004). Mainly two types of crops were grown on the chinampas, namely food crops and ornamental plants (Puig 1994).

The food crops grown during the Aztec rule were (Jiménez-Osornio and Gomez-Pompa 1991; Puig 1991):

- Amaranth (*Amaranthus leucocarpus* L.)
- Beans (*Phaseolus* spp.)
- Tomatoes (*Lycopersicum* spp.)
- Chilies (*Capsicum annum* L.)
- Maize (*Zea mays* L.)
- Gourds (*Cucurbita* spp.)
- Sorrel (*Oxalis acutifolia* Prog.): edible tubers
- Chia (*Salvia hispanica* L.): oilseed

Ornamental plants (indicative of the importance of flowers in pre-Hispanic times) were (Puig 1994):

- Tagetes (*Tagetes erecta* L.)
- Aztec lily (*Tigridia pavonia* [L. f.] DC.)
- Dahlias (*Dahlia* spp.)

There have been many changes in the flora of the chinampas since pre-Hispanic times, the most important event being the Spanish conquest of Tenochtitlán in 1521 and the subsequent introduction of new crops from Europe. Those new domesticated species were incorporated into the system without replacing the traditional crops, thus increasing biodiversity (Jiménez-Osornio and Gomez-Pompa 1991).

Nowadays, Xochimilco has agricultural and cattle areas within the canal system (Solís et al. 2006) with vegetable, ornamental and dairy production (Losada et al. 1998; Torres-Lima et al. 2000). The remaining chinampas at Xochimilco combine tourism and agriculture (Losada

et al. 1998) with the main cash crops being introduced species (Jiménez-Osornio and Gomez-Pompa 1991; García-Gómez et al. 2002; Onofre 2005).

The use of weeds growing on the chinampas adds to the biodiversity as well as the productivity of the system (Jiménez-Osornio and Gomez-Pompa 1991). Weeds increase the useful biomass of the field, improve the nutrition of farmers and provide shade as well as green manure (Vieyra-Odilon and Vibrans 2001). Some non-domesticated species, such as *Chenopodium ambrosioides* L. are encouraged to grow by the farmers (Jiménez-Osornio and Gomez-Pompa 1991). *C. ambrosioides* is known to have affects on viruses, bacteria, fungi, nematodes, insects and also allelopathic affects on germination and growth of other plants (Hegazy and Farrag 2007). Therefore, it is suggested that *C. ambrosioides* may be used for plant protection (Jiménez-Osornio et al. 1996).

- Microclimate

It is suggested, that the danger of night time frost known for dry land at the same elevation is reduced due to the heat retention capacity of the water in the canals (O'Mack 1991; Crossley 2004).

- Last but not least, the large amount of individual care given to each plant in the chinampa contributes to the high yields (Altieri 1999).

Development

As stated above, the Spanish conquest of Tenochtitlán brought fundamental changes for the Valley of Mexico (Losada et al. 1998). Following the conquest, a series of drainage projects with the construction of large canals reduced the lakes (Smith and Tolstoy 1981; O'Mack 1991). With this change of the environment, also a change of the chinampa system can be noted. Evidence of the widening of fields since earlier times can be found in numerous sources. The chinampas still seen today – in rapidly declining numbers – were constructed at very different times and it is highly likely that all of the fields have been significantly transformed, rebuilt and reworked numerous times over the period of their existence. Besides, lining the chinampas with ahuejote trees ³, characteristic of the chinampa landscape over the last century, is probably relatively new to the farming system (Table 17). Lately, the trees have been disappearing rapidly (Crossley 2004).

³ Bonpland willow, *ahuejote*, *huejote* or *sauce* trees (*Salix bonplandiana* Kunth) (USDA 2008).



Table 17: Ahuejote trees lining chinampas.

Source: <http://homepage.mac.com/helipilot/.Pictures/vistasaereas/XochiNiebla.jpg>, 12.01.2009.

Challenges

Chinampa agriculture is a sustainable agricultural system endangered by modern pressures (Torres-Lima et al. 1994). The changes that have influenced the system have been imposed on the chinampa farmers and not produced by them (Jiménez-Osornio and Gomez-Pompa 1991). Siemens (2004) states, that “the output of publications on chinampas now seems inversely proportional to the degradation of the system itself” (Siemens 2004: 249).

Most of the problems of the current chinampa system can be traced back to the change in the water regime due to the urbanization of Xochimilco (Wirth 1997; Losada et al. 1998; Crossley 2004; Siemens 2004; Onofre 2005) and with it the diversion of water from the chinampa region to Mexico City (Jiménez-Osornio and Gomez-Pompa 1991; Losada et al. 1998; Juárez-Figueroa et al. 2003). Only a small section of the chinampas near Xochimilco, a larger section near Texcoco and a few small sections in the north of the basin are left, which might also be eliminated with the growth of Mexico City (O’Mack 1991; Wirth 1997). The water supply for the canals comes from a few remaining springs and partially treated sewage from Mexico City (Jiménez-Osornio and Gomez-Pompa 1991; Wirth 1997; Juárez-Figueroa et al. 2003).

The uncontrollable urban spread of Mexico City (23 millions inhabitants [Onofre 2005]) since the 1950s has been mainly at the expense of agricultural land (Losada et al. 1998; Torres-Lima et al. 2000; Crossley 2004; Siemens 2004). Hence, agricultural production decreased considerably after the 1950s due to the abandonment of 53% of the chinampas (Wirth 1997). Communal land was sold for house building and canals disappeared to make room for bridges and vehicular accesses to cultivation areas (Crossley 2004; Siemens 2004; Onofre 2005).

With the tapping of springs in 1913 to provide the city with potable water and the drilling of deep wells in the 1950s, the ground water level was significantly reduced, which caused the desiccation of most springs in the 1960s and of the canals in the 1980s (Wirth 1997; Crossley 2004; Carrillo-Rivera et al. 2008).

Additionally, the deforestation and destruction of vegetation has created conditions of rapid run off of rains which reduces the quantity of rain water absorbed and channeled to underground aquifers. The annual rainfall in Xochimilco region has declined by 30% in the last century and temperatures are slightly higher (Wirth 1997).

To replace the water lost from the springs, raw sewage was pumped into the Xochimilco canals (Wirth 1997; Crossley 2004; Carrillo-Rivera et al. 2008). Also, residents from irregular settlements utilize the canals for drainage and discharge of all household wastes (Wirth 1997; Juárez-Figueroa et al. 2003; Siemens 2004; Onofre 2005). Today, the former used human excrements unintentionally reach the chinampas via the canals (O'Mack 1991).

With the partially untreated sewage, the canals are receiving a continuous load of micro organisms and other contaminants. Increased concentrations of heavy metals, detergents and pathogenic organisms in the water are reported (Losada et al. 1998). In a study, the levels of fecal coliforms measured exceeded the figures recommended by the Mexican regulations for irrigation water in some of the agricultural area sampling sites and in all urban sites (Solís et al. 2006). Thus, vegetables can become vectors of pathogenic micro organisms and other polluting agents (García-Gómez et al. 2002). García-Gómez et al. (2002) found positive results for *Salmonella typhi* Lignieres in all vegetable samples. Additionally, there is high prevalence of *Giardia intestinalis* Kofoid and Christiansen infection among children from urban settlements in the Xochimilco area (Juárez-Figueroa et al. 2003). Chinampa farmers are trying to overcome this problem by adding disinfectants to their vegetables to sell them in better sanitary conditions (García-Gómez et al. 2002).

Another problem that cannot be wiped out with disinfectants could be heavy metals. Although elements such as Fe, Cu, Zn and Pb are present in the dissolved fraction in the Xochimilco canals, they are at levels below the maximum Mexican limits (Solís et al. 2006). Yet, some elements such as Cr, Co and Cu are present at levels considered potentially hazardous in soils. Cu is present in soils as well as in plants at levels that exceed those considered as being toxic (Mireles et al. 2004).

The levels of water and soil pollution are further increased due to the use of chemical fertilizers and chemical plant protection agents (Onofre 2005; Losada et al. 1998), as well as the excessive use of organic fertilizers such as cow dung within the chinampas. To some gardens, the equivalent of 800 t ha⁻¹ year⁻¹ of manure is applied, augmenting the risk of nitrate contamination of the surface and groundwater (Torres-Lima et al. 2000).

Apparently, long-time watering of crops with polluted water has resulted in degraded soils due to salinization (Wirth 1997; Losada et al. 1998). In a study conducted close to Mexico City, due to the accumulation of pollutants in the topsoil caused by a 90 years long application of sewage water, spore abundance of arbuscular mycorrhizal fungi in the soil was lower than in a soil only having been irrigated for five years with wastewater (Ortega-Larrocea 2001).

All these factors have led to a continuous loss of biodiversity, thus threatening the sustainability of the chinampa system. Deterioration is observed and only certain plant species can be grown (Mireles et al. 2004), sensitive crops such as tomatoes have disappeared (Losada et al. 1998; Onofre 2005). Between 1975 and 1991 at least 20 plant species disappeared from the chinampa towns of Xochimilco and Mixquic, most of which used to be part of the diet of local people (Jiménez-Osornio and Gomez-Pompa 1991).

Future

In 1987, Xochimilco was declared a World Heritage Site of the UNESCO (UNESCO 2008). In 1990, the Government of Mexico signed an accord that included specific plans for protection of the agricultural land, the restriction of urban development in chinampa zones, the advanced treatment of the sewage water and at the same time the utilization of the chinampas and protected zones for tourism (Wirth 1997). Unfortunately, those principally responsible for the success of the chinampa system, the farmers, were not consulted in the planning process and also did not receive any benefits from the UNESCO designation (Jiménez-Osornio and Gomez-Pompa 1991). At least until 1997, the government only offered the usual assistance in loans for tractors and fertilizers, even though these are no proper technologies for the chinampas. Tractors are not useful for small parcels of land and chemical fertilizers can be a further source of water pollution (Wirth 1997).

Nevertheless, the significance of the chinampas for Mexico City can not be overlooked: Xochimilco is one of its most important sources of vegetables (García-Gómez et al. 2002) and some 15 percent of the agricultural products for the Federal District, as well as a substantial quantity of the city's flowers are being produced there (Wirth 1997). The author further stresses that "in the case of Xochimilco, the need for environmental protection is directly linked to the current economic well-being of Mexico City, including jobs and food for the city" (Wirth 1997: 13).

The chinampa system is not just a hopeful model but also a successful management strategy for the recent agro ecological circumstances that are present in one of the world's biggest cities, Mexico City (Torres-Lima et al. 1994).

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Organic Agriculture in Mexico

Moritz Reckling

Latin America and especially Mexico has an ancient agricultural tradition and organic cultivation methods have been very common for millennia. Those include crop rotations, seed selection, soil fertility management (composting, mulching), sophisticated irrigation systems (especially the Aztecs with the chinampas) and community land management. Latin America and Mexico are especially famous for their hundreds of varieties of corn, over 90 varieties of chillies and very many different tomato and squash varieties (Lernoud 2007).

The agro-ecological situation is most suitable for organic production of some crops and most especially organic coffee production. Coffee is the leading Mexican organic crop that is cultivated in an ecological forest management system creating a valuable alternative to the deforestation process that is taking place in the area and generating income for thousands of small-scale farmers (Cruz 2007).

Organic Producers

Mexico has by far the most organic certified farmers worldwide with 126,000 farmers, followed by Uganda with 87,000, Italy with 45,000; Germany has in contrast only 17,600 organic certified farmers, as shown in Table 18 (approximate numbers, Willer et al. 2008). The number of farmers developed quickly, from 33,600 organic farmers in 2000 to 126,000 by the most current data (2006) (Willer et al. 2008).

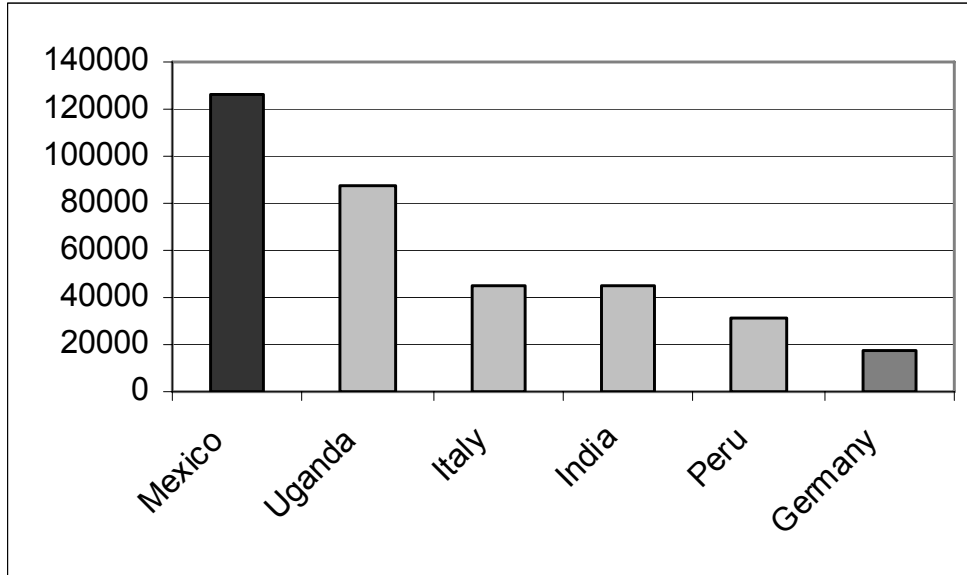


Table 18: Number of organic farmers of the five worldwide leading countries and Germany.

Source: Willer et al. 2008.

Mexico has this high number of farmers due to the dominance of indigenous low-income small-scale producers who make up for 98.6% of the organic producers (Cruz 2007). They are organised in cooperatives and certified organic using an Internal Control System (ICS) (Lernoud 2007). Besides export crops they cultivate gardens for subsistence production, e.g. vegetables and corn. They farm an average land size of 2.25 hectares per farmer (Cruz 2007). They farm 84.1% of the total organic farmland and generate 68.8% of the income earned in foreign currencies through organic exports (Cruz 2007). They depend on farming,

on the one hand for the income through the sales of the export crop and other cash crops for the local markets, and on the other hand for food and family labour. Table 19 shows a Mexican small-scale coffee farmer harvesting matured Arabica coffee fruits.



Table 19: Mexican small-scale coffee farmer harvesting matured Arabica coffee fruits.

The remaining 1.4% of organic producers are large-scale private enterprises that cover 15.9% of the organic farmland with sizes of 100 to 2,000 hectares. The owners are investors rather than farmers, employing labour for the production of the crops, earning 32.3% of the foreign-currency income (Cruz 2007).

Organic Area

Due to the small-scale nature of the farmers, the total organic land is quite small in Mexico that holds the 14th position in the world ranking with 404,000 hectares of certified organic land. In Latin America, Argentina leads with 2,220,000 ha of organic certified land due to large-scale cattle pastures. Germany has with 850,000 hectares more than double of the size of Mexico. Certified organic wild collection plays an important role for the Mexican organic sector and covers 12,650 hectares. However, the size of organic certified land in Mexico grew very quickly in the last years and doubled from 2002 (216,000) to 2006 (404,000). The share of organic certified land of the total agricultural land in Mexico is very low with 0.4% (Willer et al. 2008).

The main producer states of organic agriculture are Chiapas, followed by Oaxaca, Guerrero, Michoacan, Chihuahua, Jalisco and Veracruz (Cruz 2007) as shown in figure 2. In the southern states, organic coffee is the dominant crop and in Chihuahua intensive irrigated cultivation of vegetables and fodder crops for the USA.



Table 20: Map of Mexico showing the main producer states of organic agriculture

Source (modified): http://upload.wikimedia.org/wikipedia/commons/f/f5/Mexico_states_aguascalientes.png, 29.01.2009; Cruz 2007.

Markets

Export is the main activity in Latin America's organic sector. Around 85% of the products are destined for export to the USA and Europe (Lernoud 2007). Products are mainly sold in the non-processed stage and value is added in the importing countries. According to Willer et al. (2008), the organic exports from Mexico valued 430 million USD in 2007, while growing rapidly (Cruz 2007).

Products. Mexico is among the leaders for the world production of organic coffee, tropical fruits, cocoa and citrus fruits. 80% of Mexico's organic produce is coffee and it is the biggest organic coffee producer worldwide with 150,000 t. It is followed by Peru with half the production (75,000 t), and Sri Lanka (35,000 t). It produces 40% of the coffee production in Latin America. Moreover, Mexico leads the organic tropical fruit production (26,000 t), followed by Paraguay (20,000 t) and Ecuador (18,000 t). It produces second most organic cocoa (17,000 t) after the Dominican Republic (32,000 t) and followed by Ecuador (13,000 t). Besides, it produces 1,800 t of citrus fruits, thus being the sixth in world rank which is led by Italy (18,000 t) and the USA (4,000 t). Other organic products are apples, olives, rice, vanilla, honey, vegetables, sesame seeds, medicinal plants, soybeans, palm oil and nuts. Mexico also produces organic wheat and corn as fodder for the USA and Europe. Some organic products also enter the fair trade market including coffee, cocoa, quinoa, honey, hibiscus, bananas etc. (Willer & Yussefi 2007).

Domestic markets. Domestic markets for organic products in Latina America and Mexico are still very small although the demand for organic products grows in the big cities like Mexico

City, Buenos Aires and Sao Paulo. Very common are the 'neighbourhood fairs' which are small informal markets in the cities where producers sell their organic products directly to consumers. Furthermore, annual organic fairs called 'Exporganicos' promoted by rotating federal governments aim to unite the organic producers. Mexico City has a weekly organic fair called 'Tianguis' that builds on the tradition of local trade of the indigenous communities. Some supermarkets sell organic products like in Mexico City the 'Monterrey y Guadalajara'. Domestic sales are building on trust to the producers and often use participatory certification schemes such as the Participatory Guarantee System (PGS). This is a locally focused quality assurance systems based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange (IFOAM 2008). Generally the organic prices are higher compared to the conventional one but in a few cases as described by Lernoud (2007) organic prices are at the same level like the conventional ones, which producers make a political point with the motto "let all the consumers choose freely, not only the rich" (159). Another important organic trade system is the box scheme applied in the big cities that opens up public interest for organic products and leads to a growing domestic demand. Moreover, consumers involve themselves in the planning and financing of organic products in the 'La Comunidad Sustenta a la Agricultura' that is following the principle of the 'American Community Supported Agriculture' ⁴ (Lernoud 2007).

Other Stakeholders

Government support. Governments in Latin America including Mexico give no subsidies or economic support to organic production. In general organic development has grown with own efforts but in Mexico there is a strong interest of national and state agencies as well as donor support from Europe especially Germany (Cruz 2007).

Education and research. One university in Mexico offers a study course in agro-ecology including organic agricultural sciences (Universidad Autonoma Chapingo) and does research on organic agriculture cooperating with the Swiss Research Institute of Organic Agriculture (FiBL). Besides the university, the research centre Agricultura Ecológica Campesina (AECA) carries out organic on-farm research involving small-scale farmers (Cruz 2007).

Certification

Mexico still relies on foreign organic regulations such as the National Organic Program of the USA and the EG 834/2007 of the EU. A national organic regulation is in progress but not yet implemented (Lernoud 2007).

126,000 small-scale farmers organised in associations are organic certified using an Internal Control System (ICS) which is the only group certification scheme accepted by the authorities of the EU and the USA. The ICS reduces certification costs significantly and opens up the organic markets for the small producers organized in groups (AgroEco & GroLink 2008). A study by Schuster (2006) shows that 48 Mexican cooperatives of the international farmers association Naturland have only few difficulties complying with the organic standards although Fürst (interview) mentions that many incompliances with the organic standards appear currently. Reasons are assumed to be lack of investment in the ICS e.g. in terms of staff requirements. However, Lernoud (2007) indicates that generally the reasons for the difficulties of producers to meet the international quality and certification standards are the

⁴ Consumer families get together with a farmer and plan what to sow, develop a budget respecting the needs of the consumer and the producer. Consumers give an advanced payment to enable the production and therefore share the risks and fix the prices.

lack of information and support from the government and traders to develop capacity on quality control.

Certification is carried out by CertiMex, the only Mexican accredited certification body and many international certification bodies. Among others, Naturland is a farmers organization very active in Mexico with 56 cooperatives representing 16,000 farmers and cultivating 44,000 ha of land, producing mainly coffee which represents 10% of the total organic certified area (Naturland 2008).

Besides organic certification there is a wide range of other eco-labeling efforts in Mexico but according to Bray et al. (2002) organic certification is the only successful scheme supporting environmentally friendly agriculture and social aspects.

Table 21 shows the different organic labels. The first is the new EU organic label, followed by the organic label of the USA. The third is the label of the national certifier Certimex and the last of the international farmers' association Naturland.



Table 21: Organic labels of the EU, the USA, the national certifier Certimex and the international farmers' association Naturland

Challenges

The cultivation of genetically modified organisms (GMO) endangers the high biodiversity of corn in Mexico and threatens the integrity of organic production. There is a high risk of contamination of organic wheat and corn with genetically modified cultivars of soy and corn that have become mainstream on the continent in conventional agriculture. Furthermore, GMO contamination in consumed corn is very common and it is assumed that every Mexican tortilla contains GMO residues (Cruz 2007).

While organic agriculture is often seen as an income-generating production strategy for small producers of the global South, a study by Tovar et al. (2005) suggests that Mexican organic agriculture reproduces existing social inequalities between large and small producers in conventional Mexican agriculture. This is due to high demands for certification (staff and documentation requirements and high costs especially in the conversion period) which exclude non-supported small-scale farmers.

The Mexican organic sector could increase the benefit of the potential of organic agriculture through local processing and marketing. Since most organic produce is exported as raw produce the value is added in the import countries. The national capacity for processing could be further developed and international trade and tax regulations on processed goods discussed and changed. Domestic sales could open up the market for processed organic products and furthermore include very intensive cultivated crops such as organic vegetables that are not suitable for export. Intensive organic vegetable production would besides increase the impact of organic agriculture on the national environment and health situation.

Chinampas and Organic Agriculture

The chinampas as they were described earlier are a man-made agro-eco-system that is managed intensively using specific farming methods developed through centuries. These farming methods include many characteristics of organic farming like soil fertility management, high biodiversity, organic fertilization, crop rotations etc. Therefore it indicates that nature-sound agriculture can be achieved in a most intensive manner. However, the use of non-organic agricultural inputs and current threats to the chinampas agriculture (change in the water regime and polluted sewage water) harm the ecological nature and the sustainability.

The local non-governmental and non-profit initiative DANA A.C. is following the aim to rehabilitate the chinampas through organic agricultural techniques cooperating with the governmental authorities. In this process they have started in Xochimilco to support organic production by providing training and markets. Organic crops are sold in the organic shop of the NGO and transported to organic markets in Mexico City.

So far the chinampas' sub-urban agricultural production is for the conventional markets in Mexico City. Production for the organic markets could be a promising option increasing prices through the value addition on the one hand and ensuring the sustainability of the agro-eco-system on the other hand. Furthermore, organic production in the chinampas could increase the public attention and pressure politicians to ensure the safety of the agro-eco-systems due to the economic value of the organic markets.

The organic export market is much developed in Mexico, but crops exported do not fit into the intensive chinampas agricultural system due to their perennial and rather extensive nature e.g. coffee, fruits, cocoa etc. For the intensive, difficult-to-export crops like vegetables that are grown in the chinampas, domestic sales could therefore be more promising. The demand for vegetables in organic quality rises more and more in Mexico City as described earlier. To achieve organic production for local markets, the current cultivation practices in the chinampas can be continued in terms of soil conservation and crop rotations etc. but have to follow the requirements of organic pest control, fertilization and traceability measures. The alternatives to polluted irrigation water have to be checked and regulations developed following a simplistic approach. Here, the PGS certification scheme could be adequate and cost efficient ensuring the organic quality with little documentation requirements.

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