

## HISTORICAL AND CURRENT EXTENSION SYSTEMS IN DR. ARROYO, NORTHEASTERN MEXICO

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### **Abstract**

*Current extension systems in Mexico originate from a long history of changes in land reform, agricultural emphases, and extension administration. This research study examines the historical changes that led up to the present system, and then looks at a case study of one group of extension agents working in villages near the municipality of Dr. Arroyo, in northeastern Mexico. The beginnings of land reform and even extension stem from the Mexican Revolution of the early twentieth century, when lands were ceded to groups of small scale farmers over the period of over 50 years. Mexican extension came under federal control in 1971, and the Rural Credit Bank also provided extensionists for its loan programs during the 1980s. In the early 1990s, agricultural unions began to provide extension services to their clients, and by the late 1990s, extension had become quasi-independent of the federal government: the states provided extension services to people who could not afford to pay through contracts with state governments. The extension group of ten extension agents that this study examines was paid through this type of state contract to offer extension programs to the villages surrounding the town of Dr. Arroyo. These extensionists promoted intermediate level technology that was generally appropriate for their clientele, who were members of farmer groups called ejidos. These extensionists, however, thought that the government did not fully understand how the communities preferred to work, and were dissatisfied with other elements of their situation.*

### **Introduction**

The development of worldwide and Latin American extension systems parallels the transformation of agricultural economic systems in the period from 1950-2000 (Tonness, 2001; Lescanne, 1979). To some extent the Mexican extension system is analogous to these worldwide and Latin American shifts, but in other aspects, the Mexican extension system is unique, especially in the latter part of this period (Tuttle, 2003; Christiansen, 2002, personal communication; Yates, 1981). The similarities and differences between Mexican extension and other world wide extension systems may be reflected in the particular situation of a group of extensionists in the municipality of Dr. Arroyo, in northeastern Mexico. However, this example is not representative of the entirety of Mexican extension, but it is a specific case study of one of

the types of extension available in Mexico. The Mexican government's employment of this type of extension is relatively recent, although some of the ramifications of the adoption of this system were already apparent. This research study outlines the characteristics of this particular type of extension system, and its effect on both extension personnel and clientele, which could be a model for other areas, with some adaptations.

### **Purpose Of The Paper**

The purpose of this paper is to explore the history of Mexican extension systems as well as to take a detailed look at a current example of one type of Mexican extension system that entails both problems and opportunities.

### **Method**

The research study was a naturalistic inquiry in the qualitative tradition. This study was a part of a larger study that also employed participatory rural appraisal techniques, and one of these techniques, the ecological transect walk, was used in this study (Geilfus, 2001). The procedure of the qualitative study was drawn from Erlandson, Harris, Skipper, and Allen (1993), and Lincoln and Guba (1985), and demonstrated trustworthiness quality criteria. These criteria consisted of transferability, or the degree that findings may be transferred to other situations, similar to external validity in quantitative studies; dependability, which refers to the need for the researcher to verify or describe changing contexts/circumstances, analogous to reliability in qualitative research; credibility, the finding's believability by the study participants, comparable to internal validity in quantitative research; and confirmability, which is the extent that the study's findings may be verified or substantiated by others, akin to objectivity in quantitative studies. The study used a focus group interview with a group of 9 extension personnel in Dr. Arroyo, Mexico. The researcher also employed individual interviews with two members of this group, as well as a role play that the extensionists performed for training on participatory rural appraisal that the researcher provided at the outset of the study. In the interviews, E means extension agent, followed by the number assigned to that extensionist; P denotes community participant, while p. signifies the page of the written transcript of the tapes and n. shows the page of the notes (examples E1, p.1=extension agent one, page one of the interview transcript and P1, p.1=participant one, page one of the transcripts; obra refers to extension agent role play). The participants in this study were chosen by a process wherein gatekeepers to the extensionists, the extension administrators for the state of Nuevo Leon and the head of continuing education at the Autonomous University of Nuevo Leon, introduced the primary researcher to the coordinator of the extension group, who then notified the extensionists that the researcher would be present. The study also incorporated individual interviews with selected community members in the villages of Puentes and La Roca, with whom the extension agents from these villages introduced the primary researcher.

The primary researcher walked the ecological transect with a few villagers from each community. The procedure for the ecological transect was as follows. The researcher and the villagers decided which was the best transect (line that bisects all ecological zones of the community), and walked the transect with the villagers, discussing the characteristics of each zone as they walked. The researcher then drew the transect, demarcating each ecological zone and illustrating the types of crops, plants, animals, soils, water resources, and buildings found in each zone, and who worked where in each zone. The researcher later met with the entire focus group of men and women in each community to discuss what she had found during the transect

walk as related to the types of crops, plants, animals, soils, water resources, and roles of the villagers found in each zone.

### **Theoretical Framework**

In Latin America, agricultural economic systems transformed over the years from 1950-2002, from a focus on large scale agriculture and livestock operations that was followed by export motivated trade unions and cooperatives and then to grassroots development that responded to local needs of small farmers. The evolution of extension systems paralleled that of agricultural systems, with emphasis first on training managers for large enterprises, followed by training for agricultural export production with cooperatives and trade unions. Subsequently, extension based training more upon the needs of communities and including small farmers, which focused on educating this clientele with methods appropriate to their educational level (Lescanne, 1979). Tonness (2001) noted that worldwide, by the mid 1980's, farming systems research had evolved and extension viewed the farmer's role as key while looking at farms as complex entities. Tonness noted that from 1980-2000, some extensionists began to use participatory methods that refocused the historical teaching paradigm to a learning paradigm. Tonnes (2001) also stated that the extension agent plays a vital role in the field of development because most developing countries have a rural-based economy. The sustainability and productivity of the rural economy of developing nations are directly associated with the stewardship of natural resources. The historical methods of transfer and diffusion of agricultural technology is often not adequate in the current system of globalization, yet the extension profession plays a role in the detection, adaptation and allocation of technology.

The history of agricultural and land reform in Mexico and extension programs is intrinsically related. The Mexican Revolution in the early 20<sup>th</sup> century altered the previous oppressive *hacienda* system of plantation agriculture/large scale livestock ranches that dominated the country after Spanish colonization (Yates, 1981). Over the period from 1917-1980, the Mexican government distributed land in the form of communal land distributions to indigenous groups. The government also distributed land to groups of farmers who formed *ejidos*. *Ejidors* averaged about 100 members per group, with each farmer receiving 25 acres each. The villages of Puentes and La Roca in the Dr. Arroyo municipality included in this study that the group of extension agents served consisted of two different *ejidos* (Tuttle, Lindner & Dooley, 2005).

In Mexico, the agricultural extension service began in 1911 with small groups of agronomists as leaders, but did not become a division in the federal Department of Agriculture until 1971. In 1976, a governmental agency called The Rural Credit Bank started its own extension services for farmers who had taken out loans (Yates, 1981). The bank extensionists helped farmers with getting seeds and fertilizer, filling out the credit application, getting the use of a tractor, supervising weeding and inspecting the farm (Yates, 1981). Yates discovered that Department of Agriculture extensionists gave agricultural technical assistance, but also played a part in regulation, reporting condemned crops and animals. This role made it difficult to maintain good relationships with the farmers. Extension personnel in Mexico are faced with numerous problems that are a barrier to program implementation (Yates, 1981). Many farmers are traditional and did not want to adopt new technologies as this would show disrespect for their ancestors who used traditional means. There were few youth programs like 4-H to encourage the younger generation to adopt change. Extension agents were generally very dedicated, travelling long distances, and working long hours. Most were men, but there were a small number of

women extensionists who focus on family and consumer science projects. Yates found that extension personnel were poorly paid, salaries were sometimes in arrears, and the government did not often fund transportation costs. Additionally, extension agents had few opportunities for promotion, and top down administration often hampered their ability to work creatively with their clients, requiring project regulations that frequently do not agree with the organization and attitudes at the grassroots level. Extension personnel focused on working with the *ejidos*, and rarely prioritized work with small, private farmers (Yates, 1981).

### Results And Findings

Elders in the communities of Puentes and La Roca described early “extension” programs, which were tied with land reform policies during the early-mid twentieth century. Two of the villagers spoke of the history of “extension” during the oral history interviews. One of the participants from Puentes, when asked if there had been extensionists helping them in the past, after the formation of the *ejidos*, stated that there was a person who “guided one and viewed how things were going every time he came (P4, p. 1, 2).” During the formation of the *ejidos* in this area in the 1940’s, the extension system serving the *ejidos* did not exist in Mexico in a formal sense; this person helped to administer land reform edicts and acted as a liaison between small-scale farmers and the federal government on land reform issues. He also mentioned that the land reform administrator did not visit the *ejidos*, but that a commission from the *ejido* traveled to Monterrey to see the commissioner, who met with them. The trip evidenced some peculiar accommodations. “We went to Monterrey in an old truck on the road—we rode in the bed of the truck where they had pigs that went along with us—nothing else could fit in there. If someone else came in the opposite direction we had to back up, in order for them to pass on the curves of the road. It took all day to get there, because you had to go step by step, for if someone was coming in the other direction, you had to beep the horn so the other vehicle could come first—therefore we didn’t arrive in Monterrey in a little bit of time, no (P4, p.1, 2).” Another community member from Puentes stated that the commission went to Saltillo, but that in 1943 or 1947, a young man came to the community by horse, just to show him the land reform agreement (P6, p.1). During the same interview, a female participant clarified the roles of these two types of administrators—“with the authorization of the one that came here, then the commission went to Monterrey and the commissioners met with them (P7, p.2).”

Since 1992, the Mexican extension system has transformed greatly. Before this time, farmers who were not members of farmers’ groups called *ejidos* and owned less than 100 hectares, worked with federal extension agents. Those with more than 100 hectares had to pay a fee for governmental extension service, but most opted for private consultants. After 1992, commodity organizations formed, such as livestock unions, and these groups paid for their own extension personnel. Research and extension services became quasi-independent of the government (Christiansen, personal communication, 2002). In areas where people could not afford to pay for extension services, the federal and state governments arranged contracts to provide “private” extension agents who formed their own extension offices (Oaxaca, personal communication, 2002).

By the year 2000 the federal government mandated that agents implement extension projects with groups of small scale farmers. The state and federal governments supplied partial aid to these groups; while the groups also contributed their own funds. State and federal administrators met with extension personnel, designed projects, and drafted solicitudes with signatures of all group members. State and federal administrators visited the communities once

per year to discuss project solicitations with group members, in order to make sure the solicitation meets governmental requisites. These administrators evaluated the progress of the projects and the extensionists' work once per year. The federal and state government also gives loans to group businesses (Tuttle, 2003).

This system has incurred various problems, due to its structure. Other problems have occurred, resulting from the attitudes of both extension personnel and community members. Extension personnel in Dr. Arroyo tended to disparage the elitist type of extension agent, one who does not communicate well with the people because of his/her "superior" education and social standing. Their humorous and negative portrayal of an elitist agent manifested this attitude during a role play; the researcher also observed their non-elitist attitudes. They portrayed the elitist extension agent as one who graduated from an elitist university, drove a four wheel drive vehicle, was equipped with a laptop, did not know how to communicate with the villagers, and did not want to go out into the field on foot to see the crops. One of the extensionists described a typical "elitist" extension agent: "They think that they know everything; they always go where no one calls them; because they have money, they act like God; they don't know anything about country life, and they don't have much practical experience in the field, something we need (E4, p.1). Conversely, they characterized a non-elitist extensionist as one who came on foot to the community, and struck up an informal conversation with the villagers before going out into the field to see crops or animals.

The background of the extensionists from Dr. Arroyo reflects their non-elitist attitude. One of the extensionists was a veterinarian, while the others had graduated with undergraduate agriculture or agribusiness degrees. As a whole they disparaged the elitist attitude, and most were from rural areas themselves. Friction had occurred between the coordinator and the others, as one agent stated "the coordinator doesn't do anything." This mistrust may be due to the coordinator's long time role in the "old" extension system, and his non-local residence. The extensionists were also frustrated with the government for not covering transportation and educational material costs, nor office rent in the contract budget. One agent noted that the contract requires them to work in such a large number of communities that they normally perform needs assessments as fast as possible.

A portion of the thick description from the researcher's dissertation (Tuttle, 2003, pp. 70-72) describes the atmosphere of the town of Dr. Arroyo, its surroundings, and the extension group's office. "As I drove to Dr. Arroyo, following an unknown path, I traveled upward from Monterrey through a rather significant mountain pass that was harrowing to drive—the highway had four-lanes, but the grading seemed too steep. I noticed how dry the terrain was, it seemed to be mostly scrub brush with rocky soils, and I wondered how the inhabitants made a living in such inhospitable terrain. Although once I went through the mountain pass onto the plateau, I noticed a relatively prosperous agricultural area near Galeana, with peach and orange groves and huge arches of tracking irrigation systems in fields of alfalfa. I also noticed that it was much cooler than in Monterrey at an elevation of approximately 5000 feet above sea level. From this plateau, I drove past the regional commercial center of Matahuala, a city of 600,000 denizens, and wended my way through the hills, to Dr. Arroyo, forty-five kilometers away. I drove over a large hill and below me lay Dr. Arroyo—the church steeple and rectangular layout of the small town (25,000 inhabitants) welcomed me. Dr. Arroyo, a county seat, immediately impressed me as a safe, healthy, pleasant place. Its small town bustle, with agricultural trucks and pickups bumping over the rough concrete streets flanked by 19th and 20th century one or two story

buildings, was infused with the cool air and laid back atmosphere often apparent in high altitude settlements.

One extensionist invited me to come up and meet the other personnel individually the next morning. That next day I met him and we walked several blocks through the streets of the town and two plazas, or parks, landscaped with trees and benches that each took up a four block area. The smell of diesel and gasoline filled the air, as cars and trucks passed by us on one of the main thoroughfares. We passed a street side fruit stand filled with bananas, mangoes, oranges and peaches, and then arrived at the extension office. The extension office was a one-story building, one room wide and two rooms deep. Above the front door, there was a sign with the name of the extension organization, tractors, corn, and cows painted on it. Inside, the building was rather sparsely furnished, with three desks, two computers, several chairs and a side storage room, where the extensionists had placed photos of extension activities and posters on the windows.”

The extension office in Dr. Arroyo consists of 10 extensionists, “We are made up of nine lieutenants and one coordinator,” stated one of these respondents. Four of them had been working in the area 5 years, 2 years, 9 months, and 3 months, respectively (E4, E2, E1, E3), although the Dr. Arroyo contracts began only 2 years before the study. Extension programs included technical assistance in animal and plant genetic selection (E3, p.3), increasing family income through carpentry and blacksmithing business, and controlling soil erosion (E2, p.3). The extension personnel offered various projects: blacksmithing; cattle; goat; carpentry; commercial tortilla making; corn flour and sausage production; and family and commercial vegetable production (E3, p.1). They also helped with “productive reconversion,” (E1, p. 2) which was promoting alternatives to corn production—such as vegetables, improved pastures, and *nopales* (cactus leaves eaten for food) (E1, p.2). The extensionists promoted mesquite and pine reforestation projects (E2, p.3).

The technology that this group of extensionists promotes was usually intermediate in complexity and scale. For example, one of the extension clients in the village of La Roca used a small scale milking machine that can be moved from cow to cow—this villager has a small herd of dairy cows and sells cheese to a store in Dr. Arroyo. This same client has adopted the use of a backpack sprayer to control weeds in his cornfield. Also, the villager had constructed a small, open-air milking parlor with concrete feed bunks. He had built a feed storage shed adjacent to the back of the house, and it contained bales of fragrant, olive green alfalfa as well as bags of concentrate feed for the cattle. He had a small gasoline engine feed mill to chop up the hay and mix it with the concentrate. Another example, in the village of Puentes, was a small scale feed mill owned by the women’s group in the goat project; they combined pen feeding of the goats with shepherded pasturing, a semi-intensive system. This promotion of intermediate level technology seems to dovetail with the extensionist’s anti-elitist attitudes—they advised that their clientele use sustainable, appropriate technology. One extension agent, however, showed the researcher a complicated plan for managing sheep and goats. A quote from the researcher’s dissertation (Tuttle, 2003, p. 80) commented on this: “It was a perfect example of something an extension specialist designed that would be understandable to the university educated extension agents and myself, but almost completely incomprehensible and useless to the local people. This sort of thing is not in the grassroots spirit of participatory methods, but evidence of a top-down approach.”

Another indication of non-elitist extensionist attitudes, however, is how well they cater to the daily schedules of the locals when planning extension programs. The extension agents from

Dr. Arroyo clued me in on the village men's work schedules and when they normally have meeting times. The schedule differs somewhat according to the type of work that each community does. "The men work in the fields very early, before the sun rises and then at midday they go to eat—generally they eat in the fields for breakfast and then eat [lunch] at home"(E1, p.1; E2, p. 2). In Puentes, the extensionists often arrive around 8-10 AM in the morning to notify the villagers that they will have a meeting that afternoon, around 6 PM, after the men come home from the fields and eat their dinner. Women in Puentes prefer to meet in the mid-afternoon, and the dairy farmers and their wives in La Roca favor midday meetings, at a time between the milking of cattle (E1, p.1). The extension agent in La Roca arranges meetings the day before, often sending a message with a community member, rather than going in person; the agents adhere to these preferred times for meetings, in order to have productive sessions.

The ecological transects of the villages of Puentes and La Roca manifest the varying ecology and agriculture of the region where the extension agents work, and this affects the types of programs on which they focus (Tables 1 and 2). Puentes, with ample irrigation, is more of an agricultural community, basing its living on the production of vegetables and alfalfa hay, while La Roca bases its economy upon the dairy industry, primarily cheesemaking. Both of the communities use livestock and corn for subsistence, however. Extension programs in Puentes have attempted to encourage the community to adopt more intensive methods of raising livestock, i.e. the goat project mentioned above, but the community, in general, does not seem to practice this. In La Roca, villagers concentrate more on small scale, intensive dairying, due to the lack of irrigation, and the extensionist for La Roca has encouraged this. One individual in the community adopted many technologies, including the innovations mentioned before, as well as contour planting with live grass barriers to conserve water and prevent erosion. Other farmers in the community, however, have not adopted as many of these techniques.

**Table 1. Ecological transect of the community of Puentes.**

ECOLOGY	VALLEY	HILLS/MOUNTAINS
SOILS	Good soils, clayey	Dry, sandy soils with rocks,
WATER	Irrigation for crops and household use “Sweet” water	No water, except when it rains
CROPS	<ul style="list-style-type: none"> <li>• Alfalfa</li> <li>• Corn</li> <li>• Oats</li> <li>• Hot pepper</li> <li>• Beans</li> <li>• Grapes</li> <li>• Apples</li> <li>• Tomatoes</li> <li>• Onions</li> </ul>	<ul style="list-style-type: none"> <li>• “Lechugia” (a palm used for its fiber to make mats and shoes)</li> <li>• “Viznagos” (used to make sweets)</li> <li>• Palms (flowers eaten)</li> </ul>
ANIMALS	<ul style="list-style-type: none"> <li>• Cows</li> <li>• Pigs</li> <li>• Goats</li> <li>• Horses</li> <li>• Donkeys</li> <li>• Sheep</li> <li>• Chickens</li> <li>• Turkeys</li> </ul>	<ul style="list-style-type: none"> <li>• Cows, sheep</li> <li>• Horses, donkeys</li> <li>• Vipers</li> <li>• Deer</li> <li>• Rabbits</li> <li>• Bears</li> <li>• Mountain lions</li> <li>• Foxes</li> <li>• Coyotes</li> <li>• Lizards</li> <li>• Chameleons</li> <li>• Scorpions</li> <li>• Tejones-Raccoon</li> <li>• Jabali - Bobcat</li> </ul>
WHO DOES THE LABOR	The whole family	Men and young folks Women go there to harvest “lechugia” palms
HOW IT WAS BEFORE	Same soils There was a lot of water (wetlands and currents in the rivers) “There is no water now”	Less rangeland trees, bushes and grasses plants before (when people harvested “lechugia” palms). More rangeland plants now. There is the same amount of water now.

**Table 2. Ecological transect of the community of La Roca.**

ECOLOGY	FLATTER LAND	HILLS
SOILS	Dry, hard soils, good soils	Sandy, with soft rocks. "Ugly" soils
WATER	"There is no water," except for periodic rains	Only periodic rains
CROPS	<ul style="list-style-type: none"> <li>• Corn</li> <li>• Beans</li> <li>• Oats</li> <li>• Have to buy alfalfa for cows</li> </ul>	<ul style="list-style-type: none"> <li>• "A little bit of grass"</li> </ul>
ANIMALS	<ul style="list-style-type: none"> <li>• Sheep</li> <li>• Cows</li> <li>• Goats</li> <li>• Mules</li> <li>• Horses</li> <li>• Pigs</li> <li>• Chickens</li> </ul>	<ul style="list-style-type: none"> <li>• Rabbits</li> <li>• Coyotes</li> <li>• Bobcat</li> <li>• Horses</li> <li>• Goats</li> <li>• Beef cattle</li> </ul>
WHO DOES THE LABOR	The whole family	Men Sometimes women and children
HOW IT WAS BEFORE	It rained more before There were more trees and, bushes and grasses before	There were more trees and rangelands before It was greener before

Clientele level of education and clientele attitudes also played a part in the dynamics of the extension programs. Educational levels were varied, from none in the elderly to college preparatory in many younger individuals. The attitudes of the villagers affected the success of extension programs. During the role play, the extension agents portrayed some of the attitudes of the villagers. The non-elitist extension agent in the play told the villagers that they had to form groups to solicit a project, and a villager in the play replied, "Why form groups? People don't want to get together" (E7, obra, p.1). One extensionist claimed that the women worked better in groups than the men (E1, p.1). The extension agent for the village of La Roca stated that the villagers often do not follow extension recommendations because of two things: lack of crop security due to uncertain rains, and the government subsidy of 800 pesos per hectare of crops planted. On the other hand, the researcher noticed that the attitudes of the people in the villages of Puentes and La Roca were very positive in many ways—at group meetings they mentioned that they liked to learn new things and their project efforts confirmed this. It seems that the extension personnel and some projects were fairly effective, although several changes should be made to the system to improve efficacy and increase morale of the extension personnel. Although the extensionists thought that in some ways that the governmental contracts prevented them from working well with community members, the manner in which the contracts required them to do needs assessments, and the yearly evaluation of the administrators seemed to provide

accountability in the system that was not necessarily present under the old federal system, where corruption was present (Oaxaca, personal communication, 2002).

The opinion of the extension agents that people do not like to work in groups, was partially confirmed by Tuttle (2003). The men in the village of La Roca did not function well in groups—they preferred to do their “participatory” work individually, although the women in both villages and the men in Puentes seemed to work well in groups. As Tuttle’s study was only a month in length, the efficacy of group work in the communities was not observed over a long term project with government funding involved.

An important element was missing in this study: the relationship between research and extension, and how and from whom the extensionists received their post graduate training. It is necessary to know this information, in order to more fully understand how well the group interacts with researchers and trainers to transmit knowledge, or if they communicate to researchers and others what the situation and needs are of the local people, and how much autonomy villagers have in deciding what they want to learn. Understanding these relationships would allow us to better comprehend the true functionality of this example of an extension system in Mexico.

### **Educational Importance, Implications, And Application**

This example could lead to use of a similar extension system with modifications to enhance it elsewhere; it may also be utilized to analyze and provide guidelines to improve the attributes of the present system in Mexico. Recommendations to improve this system include obtaining more governmental funds to adequately cover travel and office expenses for the extensionists, as well as to increase agents’ salaries. Another recommendation would be for the administrators to allow extensionists to work with individuals, as well as groups of producers, because community members do not always want to work with groups, and the rate of adoption of innovations and extensionists’ effectiveness may be adversely affected by restricting projects to groups. Another possibility would be for the extensionists to teach community members to enhance their ability to work in groups through consensus decision making or other group work. This may require a cultural change, in the case of some of the men in the community. Most of these, however, are difficult changes to implement without creating awareness among the administrators of the project, and ultimately, the legislators who fund these projects. These problems have existed for at least 25 years, as Yates explained in 1981, and the remnants of the top-down structure of Mexican extension that he described still work to prevent change, although the system is more decentralized at this time.

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