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Cut Flowers Production Impact on Life and Health in the Andean Middle of the World

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*Cut Flowers Production Impact on Life and Health in
the Andean Middle of the World¹*

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HEALTH RESEARCH / CERTIFICATION: SCOPE

An integral approach for health research and certification related to cut flower production and distribution takes into consideration not only the knowledge of terminal results like the process/product conditions that affect worker and consumer in the final respective stages of the chain, but all conditions that encompass the whole set of relations which operate as determinants of healthiness and safeness of human activity related to flower production, not

only for workers and consumers, but to the whole society. That is, it has to understand the trade conditions that impose quality and rhythms and the business practice modes and styles which determine the



nature and logic of the whole flower activity, nationally and internationally.

The *product* has to be safe for consumers, not only good for trade, and the *process* has to be healthy, firstly inside the plants -so that the working process that affects workers lives is healthy, safe and equitable, and the plant's environmental relations are healthy and safe-, and also in the "outside" world of *business practice*, because concentrative monopolization and corrupt organization of the business destroys the human benefit derived from flowers.

The present report of CEAS's research and intervention program focuses only on the health consequences of the internal plant working processes of the selected floricultural region.

¹ Paper presentation at Friederich Ebert Stiftung Headquarter Bonn (Germany); includes slides with data, graphics and pictures that are presented separately. May, 2001

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FLORICULTURE : THE BIRTH OF PRODUCTION AND AWARENESS IN THE ANDEAN MIDDLE OF THE WORLD

The county of Cayambe and neighboring areas of Ecuador constitute one of the main flower production areas of South America. This industry virtually exploded in the past decade bringing with it important economic growth and environmental, social and economic issues for local people in Cayambe.

Located in the cold forest and high mountain ecosystems of the Equatorial Andean Region of Ecuador, considered one of the countries with higher biodiversity of the planet (i.e. in its four natural life zones: the Andes, the Coastal semi-dry region, the Amazon tropical forest and the Galapagos Islands). It includes four ecologic zones: valley; Andean mountainous plateau; cold "páramo"; and "pajonal" –straw covered elevation- and it possesses a variety of ecologic niches, classified by soil type, cliff orientation, and irrigation [Bernal & Sánchez & Zapata 2000].

Cayambe was always well known for its rich territory and represented historically a wealthy farming and cattle growing area that made part, since early colonial days, of the "hacienda" mode of agricultural production, based in the big landowner system, cheap Indian and peasant labor force and, for a long time, in traditional technology and servitude social relations. Many of this region's contemporary social and ethnic characteristics can be explained by this mode of production and social organization that lasted almost unchanged until 1949 [Ramón 1993] and then only changed very slowly towards modern agro industrial cattle and agricultural production.

The attraction of the Ecuadorian Andes for national and international flower production is due to its very high daily average of 90° sunlight during the whole year; moderate temperature with little seasonal variability; adequate soil composition; water availability; and cheap feminine/masculine, Indian and "mestizo" labor force.

Recently, the fast economic growth rate due to flower production -the Flower Production Association [Expoflores 1999] officially registered around 4000 hectares of agricultural land dedicated to intensive flower production- has provoked deeper productive and cultural changes, but involving only minor improvement of social indicators for the poorest; only a modest increase of the average rural wage is observed, even though there is a considerable increase of labor demand, not only in plantations but in subsidiary urban businesses. Permissive exploitation under the influence of neoliberal policies, with their corresponding process of labor rights regression, explain not only this contradictory combination of mild salary improvement with very intensive, stressful and most of the times destructive working conditions, but a process of concentration of wealth and distortion of the socio economic structure.

In the context of national expansion of the flower production industry, the Cayambe ecosystem occupies a privileged position, as can be seen comparing the per capita hectares dedicated to flower production in flower producing regions across Ecuador.

What we already know is that this form of modernization has provoked profound agro-technological, social and cultural changes that are severely damaging the ecosystem. What we don't still know, are the dynamics and the extent of this damage and its direct linkage to human health issues. The Cayambe region was characterized in earlier periods by much better environmental conditions (i.e. diversified agriculture; scarce areas of soil quality degradation; absence of expanded chemical water pollution; as well as limited inter and intra regional migration and cultural disruption processes). All of these conditions are now being revised by the flower production industry.

The intensive use of pesticides is a common rule in Cayambe and is part of an spiral of resistance and dose increment which produces ecological rupture and increasing resistance of insects, mushrooms and weeds

The problem of ecological degradation also affects the urban context. The city of Cayambe used to be a tranquil and pollution free urban settlement, but has now been abruptly transformed into an attraction zone for immigrants from all over the country; an immigration process made up not only of young working force demanding jobs from those nearby counties, but also coming from the Coastal provinces of Ecuador, all of which make up a seasonal floating population. The rapid built up of services for the new workers and immigrants, the resulting economic, social and cultural changes explain important lifestyle changes. As a result, a typical Andean small town is rapidly turning into a busy urban settlement, with new infrastructure and socio-cultural patterns of life. Also a marked decrease in social capital, an increase of alcohol and drug abuse, family breakdown, violence against women and children, prostitution, petty crime, and STD's; and even discotheques and similar "metropolitan" entertainment centers are now frequent.

The rural ecosystem is also affected, and its population experiences negative consequences. Not only flower laborers, but also the other members of the communities (which have been called "dormitory towns") where that labor force lives are experiencing rapid socio-economic change. Not only exposure to physical contaminants, but their lifestyles and forms of social reproduction, previously linked to Indian and mestizo rural traditions--that were developed under the rich cultural calendar of the region which have given way to an acculturation process that brings them ever closer to consumptionist profiles, and to the conditioning of the urban market and to labor, cultural and entertainment patterns increasingly controlled by external interests, all of which also makes part of a destructive and unhealthy rural ecosystem.

As the flower production industry began to explode in the mid 1990's, local farmers' unions and other organizations began looking outside the region for help to combat what they saw as an impending environmental and social catastrophe. By this time, it was already abundantly clear that some of the best valley bottom growing lands had been appropriated for transnational flower production, that floriculture workers were being exposed to dangerous levels of toxic substances, that ground water was contaminated, that toxic

materials were distributed beyond the flower plantations by wind and water, and also that it was highly probable that the health of livestock and human beings (and particularly vulnerable women and children) was being impacted.

Local resistance to the floriculture industry environmental behavior coalesced (in 1998) in a series of mass demonstrations by area farmers and their families. One of these protests was led by UNOPAC (Federation of Community Organizations of Ayora and Cayambe), which acted together with the (then) municipal governments of the region to establish legal instruments and norms for the regulation of the floriculture and other agro-industries in Cayambe and for environmental protection. Among the instruments developed was a buffer zone some three kilometers wide between areas zoned for flower production (and other agro-industry) and areas zoned for subsistence and small holding farms.

CEAS' s PRELIMINARY EPIDEMIOLOGICAL PROFILE

The Cayambe region manifests the typical health deterioration of Andean agricultural regions: a combination of poor basic health indicators, like undernourishment and infectious diseases associated with extreme poverty, as well as certain signs of "modern" pathologies, such as cancer, toxic diseases mainly chronic, malformations and other problems linked to environmental and human contamination and lack of protective regulations.

Contrary to prevailing arguments, the epidemiological profile of Cayambe doesn't appear to show any consistent improvement as an effect of agro-industrial prosperity. In fact, the chronic undernourishment rate in children under 5 years, which reads a very high 65.1% in 1986 (global undernourishment reading a high 50.7%), remains considerably higher than the national average with a rate of 62.9% (global undernourishment of 45.7%). Another important socio epidemiological indicator like infant mortality, that read 113 x 1000 in 1986, and remained at a rate of 113 x 1000, which is 2.6 times higher than the national rate in 1996. Morbidity due to diseases associated to extreme poverty (tuberculosis, malnutrition, intestinal infections) and those due to certain forms of Cancer also rose considerably.

Preliminary appraisals made by local social organizations, NGOs and CEAS have started to show a negative ecological and health impact of current flower industry practices of those plantations that do not comply to international conduct principles and green seal social and ecological conditions. These studies round up a preliminary balance of deterioration: insufficient processing of contaminated and domestic water; failure relative to safe handling of toxic materials, storage and application of pesticides; workers completely ignorant of the danger of pesticide exposure; workers wearing pesticide saturated clothing and bringing it into their households, thus exposing their families; uncontained pesticide saturated water or dust being carried by wind to neighboring livestock, households, farms, urban neighborhoods and schools; incorrect application and superdoses contaminating ground water and penetrating to underground aquifers

(preliminary evidence of this already exists); and pesticide saturated greenhouse plastic and recipients taken by small recycling enterprises and poor farmers for domestic use after it is improperly disposed of by the plantations.

Some nationwide indications are appearing and even though scientific studies and information about health effects of pesticide abuse in Ecuador are scarce, some signs begin to indicate at least the small “tip of the iceberg” evidence. Official labor force recorded pesticide toxicity levels have been increasing from 0.08 per hundred thousand in 1978, to 3.54 per hundred thousand in 1990 and 13.06 per hundred thousand in 1997 [MSP 1999; Vaca 2000]. Our preliminary research suggests that this pattern is even more dramatic in the Cayambe region.

Only partial or preliminary estimates of pesticide contamination, human exposure and toxicity are specifically available for Cayambe. But they suggest a considerable impact.

In CEAS’s ECOHEALTH Program first stage study, geared to establish basic epidemiological evidences of neurobehavioural impact of pesticide exposure and to develop a community driven health and toxicity monitoring system, a representative sample of cut flower workers of four selected communities was studied, where more than a third of their population is occupied in the flower industry and some alarming preliminary findings obtained.

The resulting sample was mainly formed by young workers ranging basically from 18 to 24 years of age (80%) and the rest divided equally among the younger -less than 18 years of age- and the older workers -more than 34 years-. Gender distribution showed 6:1 ratio towards the feminine in the younger age strata, almost 1:1 in the middle strata and 9:1 male predominance in the older group. Most of the work force had elementary level education and less than 10% completed high school; 56% of them appeal to multiple jobs for survival reasons (nearly 40% in home agricultural activities, 24% in other flower production jobs and 10% as craftsman or petty dealers.

In the area of Cayambe labor rotation is considerable and at the time of our survey, more than 60% of the study population had been employed for less than two years in the last employment, all of which makes difficult to establish clear exposure groups. Nearly 80% of them came from working in other flower plantations. A majority of workers (77%) held formal working contracts, the rest were subemployees and seasonal laborers. The sample included nearly 60% of flower cutters (harvesters); 20% of maintenance workers; 12% of postharvesters; 5% of fumigation workers; and the rest a small group of auxiliary administrative and maintenance workers.

A clear majority of the studied workers perceived most of the common work loads and stressors of floriculture: chemical products (90%); excessive heat (80%); dusts (73%); humidity (70%); excessive cold (62%); psychological overload (51%); loud noise (47%); mechanic hazards (21%); and interpersonal conflict (15%). The workload histogram (perceived hazards)

varies considerably between work sections (harvest; postharvest and

| Severe AchE Reduction | | |
|------------------------------|------------|--------------|
| AchE Act. | No. | % |
| NORMAL | 89 | 55.1 |
| REDUCED | 80 | 44.9 |
| TOTAL | 178 | 100.0 |

AchE mean: significantly low 24.37 Ug Hgb (c.i. 95% : 22.9 – 25.8)

Source: CEAS EcoHealth Project 1st Stage Survey, 1998

D21

maintenance). Harvest and fumigation workers experience stressors more frequently, but in all three sections chemical substance perception peaks high. Even though faulty application of protective measures is widespread (i.e. gloves only in 72%; caps in 78%; appropriate clothing management in 67%; long-sleeved aprons 63%; regular hand washing and bathing 53%; and a surprisingly low use of masks 29%), a slightly better acceptance of protective measures was observed in workers of the highly exposed sections (harvest and fumigation 55%; postharvest 47.6%), whereas those of supposedly lower exposition -administrative and maintenance- seem to comply with lower standards, all of which probably explains their relatively lower AchE levels.

According to our analytic tool of the *epidemiologic profile*, we studied the health impact through protective and destructive conditions (health determinants) and were able to establish, in that exploratory stage, some interesting findings. In broad terms our study suggests a very high neurotoxic impact of pesticide use, measured by two main types of dependent conditions (variables): physically observed exposure through Erythrocyte Cholinestase reduction (AchE)³; and clinically perceived neurotoxic signs/symptoms. The AchE activity reduction was found in a high percentage (45%, c.i. of 5%) of the worker population, with a significantly low mean of 24.37 Ug Hgb (c.i. at 95% of 22.9 to 25.8). The first quartile of the AchE reduced workers, showed values lower than 14.5 Ug Hgb. In a sample (n=67) of workers of a plantation as much as 59.7% of the workers showed AchE reduction. The percentage of AchE reduction in workers that we were able to study in the communities, varied very much from 100% in Candelaria; to 55.6% in Carrera; to 11.4% in Sta. Marianita and 8.3% in Cangahuapungo.

The epidemiological profile revealed some of the main protection/exposure relations. The expected more hazardous harvest/fumigation *working section* showed a better use of protection measures (55%) and a lower AchE reduction 42.5%, whereas the maintenance group only complied to basic protection measures in 39.5%, and showed a higher 52.3% of reduction. The maintenance workers are very frequently informal subemployees or belong to terciarized work force, and obtain even less rigorous protection or none. This

³ The local basal reference value of AchE activity of our control population (n= 112, urban university students) of 28.8 Ug Hgb -very similar to the USA assay Testmate 460 reported mean of 27.1-, was found significantly higher than our workers mean level of 24.37 Ug Hgb of Hemoglobin adjusted enzyme level.

inverse relation between protective measures and AchE reduction doesn't appear with the longer employment *duration*, because beginners (< 2 yrs. and the very few veteran workers ->4 yrs.-) are having the highest rates of protection use (54.6%), and a much higher AchE reduction of 52.3%, while the more experienced group, working 2 to 4 years, expressed a careless attitude (a low 35% of protection use) and surprisingly appeared with less Ache reduction (32.8%). This apparent contradiction can be understood if one analyzes other variables like spontaneous knowledge building about pesticide hazards (even though there is no formal sustainable prevention and preventive education program), equipment inadequacy, age and gender related attitudes. In effect, with time the veteran workers -usually of older age- use protective equipment more laxly but seem to know more about pesticide hazards (56% compared to only 34% in the beginners). Very frequently workers complain of equipment inadequacy (uncomfortable masks, hard leather gloves, short sleeve aprons). Male workers tend to know more about pesticides (49%) than females (30%) but are more affected and denote higher AchE reduction (50.5% compared to female 36.6%) probably due to macho conduct, and specially in the younger age strata. Frequently we heard sexist comments about being young and invulnerable. Also a higher educational degree is associated with less Ache reduction. The contrast between exposure of formal and informal workers is deep, as was mentioned before; the first subgroup of more stable contract workers showed a lesser percentage of AchE reduction (43.2%) in comparison with the occasional and terciarized workers (52.5). Finally, the multiple job workers, usually in other pesticide agricultural tasks show a higher exposure (AchE reduction in 53.8%) than the one job flower workers (42.9%).

So in general the physiological evidence of enzyme reduction points towards a clear scenario of human toxicity, which is corroborated by the high prevalence of a set of signs and symptoms that provide clinical confirmation of the problem. Nearly 60% of workers manifested nervous system symptoms (headache -35%-; dizziness -27%-; hand trembling -12%-; blurred vision -10%-; nervousness -10%-; fainting in greenhouse -7%-; plus sleepiness, anorexia, and even convulsions); compatible respiratory, eyes and ears affections appeared in 40% of cases; 29% claimed postural back dorso-lumbar problems and arms pain; 19% compatible digestive system disorders; dermatological complaints in 16%; 10% had genitourinary problems. It is interesting to affirm that these percentages clearly and significantly surpass the ones found in the urban control group.

In the light of those preliminary findings it is surprising to analyze the results of periodical AchE testing by laboratories that manage the neurotoxicity screening of cut flower firms. We have seen recent yearly reports of no detected AchE reduction cases, or at the most 4% or 2.7%. This could be due to any or a combination of the following reasons: inadequate laboratory standards and protocols; inability of the enzyme reduction test to recognize low dose chronic toxicity accumulation; and even fairly good protection measures of the plantations accounted for in those tests.

At the same time it is also surprising to find a constant presence of low blood Hemoglobin or anemia in a very high percentage of workers. This has been explained as a nutritional iron deficiency problem by the plantation's medical services, but there are growing evidences that it could be a problem of bone marrow toxicity and aplastic anemia, as an alternative sign of chronic toxicity.

BASIC PROPOSALS FOR COMMUNITY DRIVEN AND TECHNICALLY BASED ECOLOGICAL AND HEALTH FLORICULTURE CONTROL

Even though an elite of good willed and ecologically aware plantations that constitute no more than 10% of the installed producers of cut flowers in Ecuador, initial studies like ours, are pointing out a complex situation of serious human and ecological harm, which can not be justified by the importance of flower production for the country and thousands of worker families that live from that.

There is a clear relation between a cut flower production structure of monopolistic and community insensitive nature, and the prevalence of undemocratic, ecologically irresponsible, socially inequitable and unhealthy conditions. But until a renewed model of human development and economical production is constructed by the people of our countries, some urgent goals have to be met in order to defend basic population and environment.

It is our center's opinion that all the involved worker groups, governmental and scientific-technical entities, should combine efforts towards the strengthening of a community driven process of *research*, *monitoring* and socially controlled *intervention*, geared towards the simultaneous achievement of the following objectives: a) an improvement of plantation systems that are already involved in worker protection and social well being standards, as much as in sound ecological procedures based on transference towards organic and pesticide substitution processes (such as the FLP and Max Havelaard qualified enterprises) and integral plague management systems; b) a process of community grassroots organization and network, fully involved in participatory programs aimed at the development of social control over sustainable standards, legal norms and models of production; c) the development of instruments (economical, legal, epidemiological, medical, ecological and socio anthropological), that allow for the application and evaluation of the previous objectives; d) the promotion of national inter-institutional and multicultural entities that transform those efforts in public national policy and regulations, like the one that IEDECA and CEAS from Ecuador are promoting; and e) the involvement of gender and ethno-culturally sensitive mechanisms in all the previously mentioned objectives.

CEAS ECOHEALTH Program's second stage is being developed in order to provide ample ecological and epidemiological evidences and organizational experiences for the fulfillment of the above mentioned goals.

Aside from a tighter control of contractual conditions; a transparent and limited allowance of extra labor hours; worker protection and safety regulations, improvement of preventive training and information programs, our center is

preparing a design and some technical instruments that make possible a complete transformation of the plantation health services. This proposal includes the gearing from a passive, individual terminal problem and spontaneous demand assistance oriented system, towards a more active, collective and determinant prevention oriented mechanism.

Some basic changes are needed in order to accomplish the health renovation. Mainly, participative worker involvement and training; professional retraining; the automation of a standardized clinical history and information system, not only based on isolated periodic Ache readings, but on the monitoring of collective and individual curves of the enzyme plus a set of standard indicators or tracers of toxicity (specially chronic), and of other prevalent health problems. CEAS' s PENTOX system could be used as part of such effort.

Flowers make part of the beautiful side of life in our Planet, but in irresponsible hands that operate under the inhumane lucrative logic of monopolies, their production is converted in part of the dark and violent side of humanity. Lets keep fighting for the promotion of their beauty as part of the process of rehumanizing our economical and social structures.