

## METHODOLOGICAL ASPECTS OF INTEGRATING AGROECOLOGICAL AND SOCIOECONOMICAL NUMERICAL DATA FOR BRAZILIAN DRYLANDS

The Brazilian drylands are located in the Northeast area of the country, between 3 and 19 degrees latitude South. With an area of 1 million square kilometers and a population of 20 million in the rural zone, the Brazilian dry lands are home to 2.800.000 farmers. Approximately 85% of the farmers own 15% of the land while another 5% own almost 75% of the land in this area. The Northeast has the highest Brazilian indices of infant mortality, illiteracy, unemployment, and poverty. Periodic droughts in this region produce severe social crises with hunger, exodus, invasion of cities by farmers, and stealing. Over the last hundred years different developmental politics have increased the fragility of the agroecosystems; similar drought in 1938 and 1982 produced more severe effects in 1982. Most of the international financed money goes to bureaucratic government personnel salaries and operating costs of the state institutions. Four centuries of agriculture have changed this large region into a complex mosaic of agroecosystems. To understand the variables that limit and affect the Brazilian drylands it is essential to take an integrated and hierarchical view of the agroecological and socioeconomical systems. Due to the lack of data on this region, the use of remote sensing imagery (NOAA, LANDSAT & SPOT) by the CNPDA Lab is the only possible way to detect, identify, qualify, quantify, map, and monitor the existing agroecosystems and the change in land use process. This has been done in almost 60 counties in eight states. The GIS has been helpful in giving a spatial dimension to the numerical data from ecosystem and farm samples. GIS algorithms have made it possible to integrate vector and raster data, such as maps and satellite images. The data now available is probably sufficient to develop hierarchical and numerical models on the variables that limit and affect the agricultural production and the agroecosystems of the Brazilian drylands.

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