



Socio-Demographic Development and Migration against the Background of Resource Scarcity

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Problem definition:

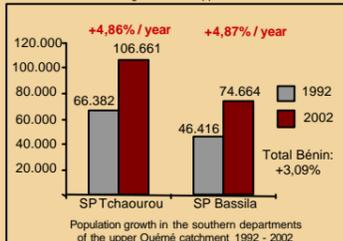
Water scarcity in Benin occurs today in temporal, spatial and economic dimensions. Compared to other limited factors for development such as land, income and health services its minor role is evident. Nevertheless its importance rises due to climate change and a fast growing population. The research on factors of natural resource management which influence the present situation will be the starting point for the discussion of population-environment dynamics through scenarios and modelling.



Lack of infrastructure and poor water quality in the newly-colonised areas of the upper Ouémé catchment

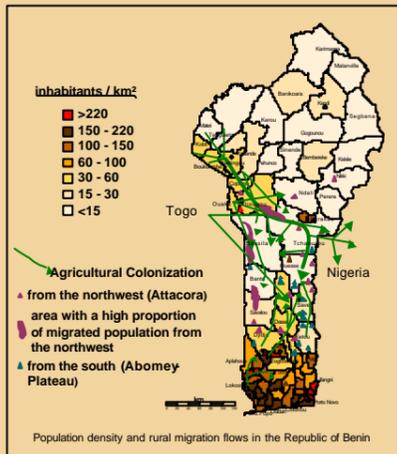


Arrival of new migrants in the upper Ouémé catchment



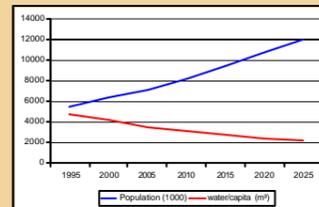
Objective:

Analysis of the interdependencies between resource availability, water use efficiency, socio-economic and demographic development. Integration of data and results from different IMPETUS-subprojects in a model tool will provide decision support for policy-makers in Benin.



Need for information on:

- water supply and water demand regarding temporal and spatial differences
- agricultural demand and supply possibilities to ameliorate water use efficiency
- quantitative and qualitative aspects of migration flows and population growth
- influencing factors of population-environment dynamics
- regulation potential of political and institutional framework with regard to resource use



Methodology:

- empirical social research
- measurements in crop production
- mapping of settlement dynamics, deforestation and land use patterns
- linking social data with remote sensing data
- mathematical programming
- data processing in a Geographic Information System (GIS)



Charcoal production, near Bassila



Slash and burn for maize farming, south of Bétou

Preparing water balance by

Analysis of water availability

The aim of the investigation is to analyse social, economic and temporal water supply deficits:

- GPS-Mapping of wells, pumps etc.
- Research on households water availability in temporal and spatial variability
- Analysis of water supply policies and strategies of state services and other implementation organisations

Analysis of water demand

This research focuses on water demand development with regard to future water shortage:

- Evaluation of secondary data

Access to clean drinking water:
71% in urban areas
46% in rural areas
(DWHH, 2000)

- Structured questionnaires with experts
- Participatory observation

Demand for water depending on

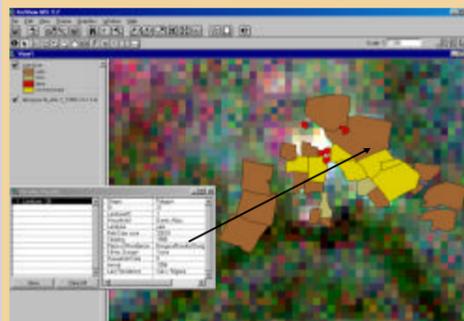
- population growth
- income
- prices and elasticities
- other variables

Si c'était les hommes qui devaient porter la jarre pour aller au marigot, il y a longtemps que toutes les maisons auraient un robinet.
(DH-Info 2/3 2002, No. 002)



Village water supply with hand pump

Population growth and migration



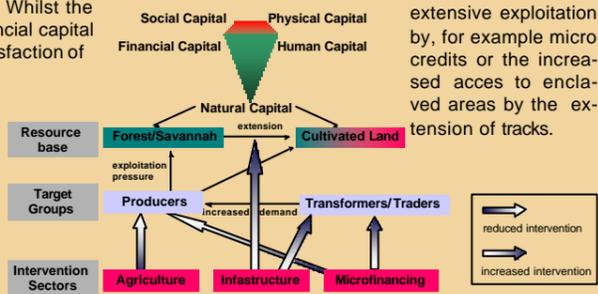
People and Pixels: GIS-application in the research on population-environment dynamics in the upper Ouémé catchment by linking remote sensing data (Landsat, 12/1999) to social science research: Here the example of Adjima, a four years old settlement of migrants with surrounding fields, about 4 km northwest from Dogue.

During the last few years, mainly the southern part of the IMPETUS-research area has become one of the most important target region for rural migration flows in Benin. With nearly 4.9% per year, the most strongly-affected departments of the upper Ouémé catchment show one of the highest population growth state-wide. There are three main tasks in the field study: the analysis of new social environments and forms of socio-political organisation among the migrants, recording and interpretation of settlement dynamics, and the monitoring and analysis of the migration-dependent changes in land use patterns.

Development policies

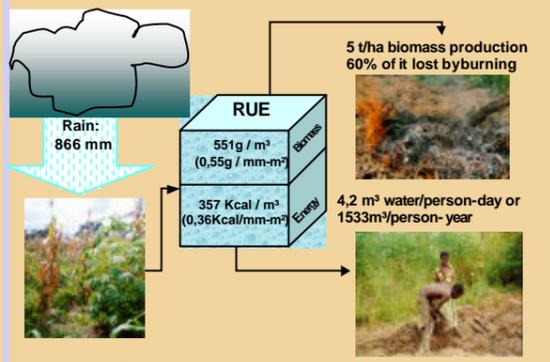
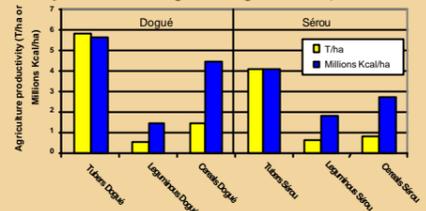
The Assets polygon describes the production mode of the average farmer household: production increase is mainly achieved by the transformation of forests and savannah into cultivated land through different sorts of (cash) crops. Whilst the transformation in financial capital contributes to the satisfaction of some of their basic needs, other capital forms and hence the level of agricultural production remain on a low level.

Since the weakening of the state implementation organisations, the service gap in the regional service system of the agrarian sector has increased still further. The totality of the integrated sector programmes of international donors concentrates on other areas of intervention. The repercussions of market development push ahead the extensive exploitation by, for example micro credits or the increased access to enclaved areas by the extension of tracks.



Influence of land use systems on organic matter dynamics and water use efficiency

- case studies in the upper Ouémé catchment
- 2 villages: Dogué: still land to clear, Sérou: no land to clear
- land use systems: forests, fallows, plantations, crop areas
- quantitative data: litter fall, organic matter, soil water etc.
- preliminary results during farming season (06-12/2001)

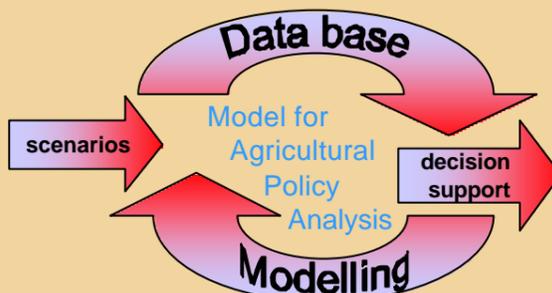


Rain Use Efficiency (RUE), biomass production / management and coverage of energy requirements in Sérou (June-December 2001)

- supposing 2000 Kcal daily need/person, 75% from production of tubers, leguminous plants and cereals
- production of 357 Kcal per m³ water
- 4,2 m³ water are necessary to produce 1500 Kcal
- annual water requirement per capita 1533m³

Possible scenarios for 2015:

- population increases 50%
 - precipitation decreases 10%
 - water demand per capita increases 20%
 - intensified migration
- versus
- technical progress in plant and animal production
 - institution and capacity building



- **Benin Mapping Tool:** agricultural, meteorological and population data, interactive by using a GIS
- **Modelling Tool:** production and consumption side of the agricultural sector
- **Prospect:** collaboration with local partners and implementation of a Policy Information Tool in Benin to ensure the sustainable use of resources

