



COMPREHENSIVE FOOD SECURITY AND VULNERABILITY ANALYSIS (CFSVA)

Livelihood Zone Descriptions

WFP/FAO/SE-CNSA/CSE/FEWS NET



Introduction

The WFP, FAO, CSE (Centre de Suivi Ecologique), SE/CNSA (Commissariat National à la Sécurité Alimentaire) and FEWS NET conducted a zoning exercise with the goal of defining zones with fairly homogenous livelihoods in order to better monitor vulnerability and early warning indicators. This exercise led to the development of a Livelihood Zone Map, showing zones within which people share broadly the same pattern of livelihood and means of subsistence. These zones are characterized by the following three factors, which influence household food consumption and are integral to analyzing vulnerability:

- 1) **Geography** – natural (topography, altitude, soil, climate, vegetation, waterways, etc.) and infrastructure (roads, railroads, telecommunications, etc.)
- 2) **Production** – agricultural, agro-pastoral, pastoral, and cash crop systems, based on local labor, hunter-gatherers, etc.
- 3) **Market access/trade** – ability to trade, sell goods and services, and find employment. Key factors include demand, the effectiveness of marketing systems, and the existence of basic infrastructure.

Methodology

The zoning exercise consisted of three important steps:

- 1) Document review and compilation of secondary data to constitute a working base and triangulate information
- 2) Consultations with national-level contacts to draft initial livelihood zone maps and descriptions
- 3) Consultations with contacts during workshops in each region to revise maps and descriptions.

1. Consolidating secondary data

Work with national- and regional-level contacts was facilitated by a document review and compilation of secondary data on aspects of topography, production systems/land use, land and vegetation, and population density. Results of partial zoning exercises conducted by other agencies in Senegal and current livelihood assessments were also analyzed.

The secondary data was used in each step of the zoning process as a basis of verification to triangulate information.

Comprehensive Food Security and Vulnerability Analysis (CFSVA) data also helped to determine zone boundaries.

2. Consulting with national-level contacts

To launch the zoning consultation workshops, a 2-day workshop was held in June 2009 for more than 20 contacts from line ministry technical departments (ex: agriculture, livestock, fishing, markets, meteorology, natural resources (water and forests), rural development, etc.), international agencies (FAO, WFP, UNICEF) and NGOs. Participants were expected to have general or empirical knowledge of the country and, preferably, familiarity with its different regions. The workshop was organized as follows:

a) Inventory and mapping of production systems

Discussions led to the creation of a general **list of production systems** that would later be subdivided. These production systems were displayed on a large map showing divisions between *départements* and key geographic characteristics (mountains/hills, rivers, lakes, etc.). Weights were accorded to each production system by *département* to indicate their relative importance and any combinations of systems.

b) Introduction to market access

The next step consisted of superimposing cities, roads and railroads on the same map. Each zone's primary sources of income (based on the production systems already indicated on the map) would later be described. Markets for the principal products being bought and sold were indicated on the map, as were trade flows and job markets.

c) Livelihood zone descriptions

Livelihood zone descriptions were written in table form. These descriptions included the primary livelihoods/sources of income, the principal characteristics of production systems, topography, vegetation, other natural resources, climate, market access, types and frequency of natural disasters/risks, and household response strategies. The descriptions were not included in the map but rather displayed alongside it.

d) Revising livelihood zone boundaries

Using a map with very small administrative units (*arrondissements*, for example) and the most recent population census data by administrative unit, each administrative unit was assigned to a livelihood zone in order to calculate populations by zone.

This initial consultation with the different contacts also served as an opportunity to approve the zoning approach and produce the elements needed to design the interview guide with contacts from each region.

3. Consulting with regional contacts

After the national workshop, which resulted in the creation of an initial map with the participation of government agencies and NGOs, regional workshops were held during July and August 2009 in each of Senegal's 14 regions.

The consultations with regional contacts aimed to meet four objectives:

1. Approve the livelihood zone map drafted at the national consultation level
2. Answer questions and respond to concerns raised during national consultations
3. Improve various aspects related to production systems, geography, markets and zone descriptions at the regional level
4. Revise livelihood zone boundaries using the smallest administrative unit possible – the Rural Community (RC) or *arrondissement*, for example.

A work session was held in each region in the form of a workshop. Participants came from the same organizations as those involved in the national consultation but this time represented the regional and *département* levels (listed in the Appendix). These contacts had a comprehensive understanding of the region in terms of the subject at hand and had lived or worked in the region for an extended period of time. In addition, the zoning team met with other individuals (such as other contacts) within various administrative structures, programs/projects, NGOs, etc.

The approach was very similar to that used during the first part of the zoning exercise but was completed much more quickly, given that the starting points were now the regional livelihood maps derived from the national map. The regional workshops were led and supervised by CSE and FEWS NET specialists and members of the SAP (Structural Adjustment Program) Committee.

4. Drafting and approving the zoning report

After the regional workshops, the information collected was compiled and mapped at the CSE. Tasks included combining the 14 regional maps and unifying zone boundaries from one region to another. Group discussions led to the development and improvement of the final map. The core group (FAO, WFP, UNICEF, SE/CNSA, FEWS NET and CSE) selected variables from the information collected in the regions that would be used to characterize the zones. Once this task was completed, 19 zones had been identified. During a two-day workshop and with FEWS NET's technical assistance, the map was reproduced and the zoning was improved. At the end of the workshop, participants had decided on 13 zones using the livelihood zone map. Understanding and ownership of the map thus began with a discussion session on how it could be used for food security analysis.

1. ZONING RESULTS

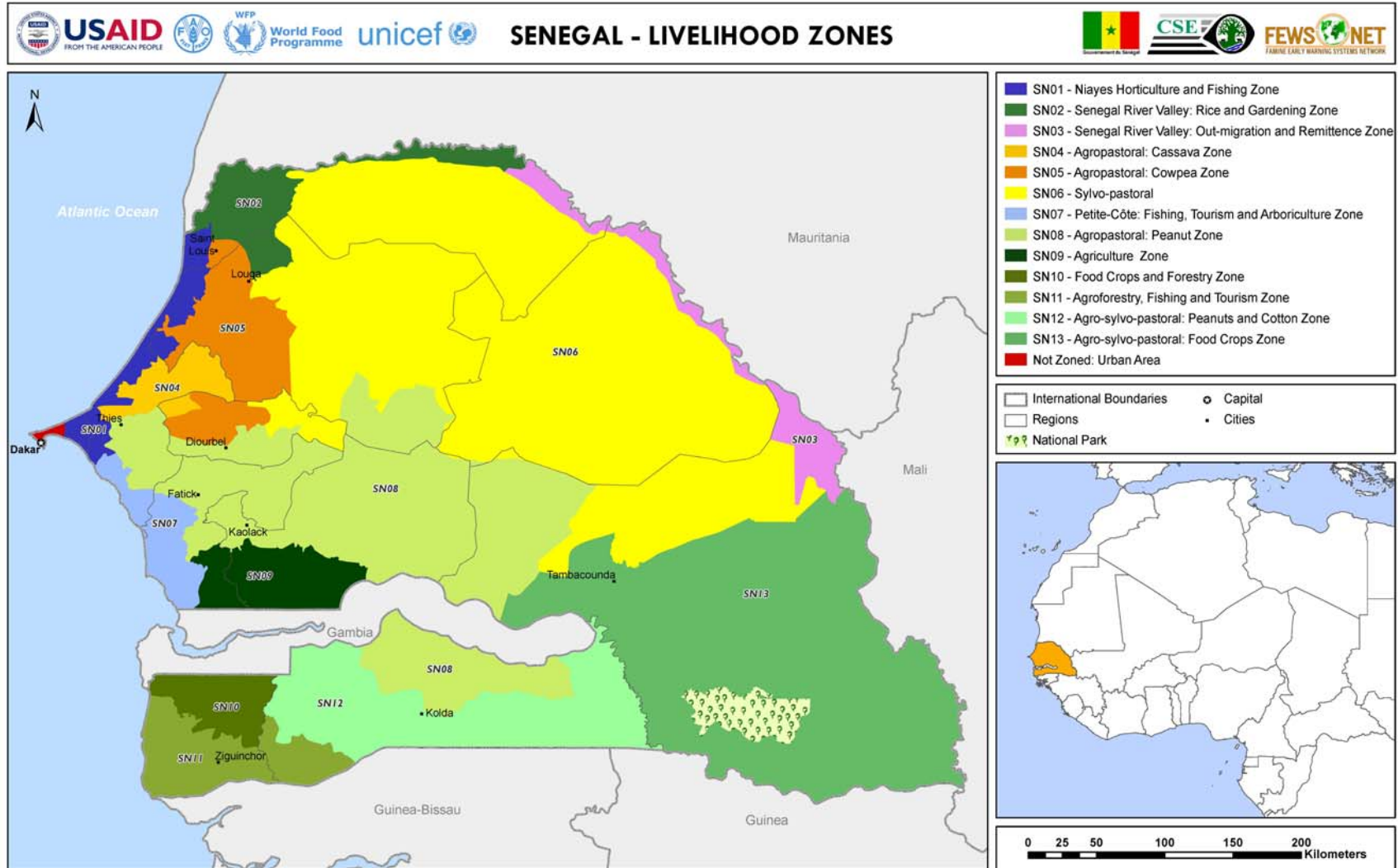
The zones identified in the exercise were primarily zones and sub-zones of Senegal's basic agro-ecological zones, which were the starting point for the exercise. In these new zones, many production systems have moved toward diversification with crops (cassava, etc.) with a more favorable market, or toward a different production system (agroforestry, with the introduction of cashew nuts, or fruit farming). Other socio-economic changes also help to explain the evolution of activities in zones where emigration is a major component of people's livelihoods. Six dominant systems were identified, with the following variants:

1. An agro-pastoral system, which represents the majority of agricultural activities, with the following variants:
 - a. Dominance of cassava production in the Thiès region and part of the Diourbel region (Keur Samba Kane Rural Community). The emergence of arboriculture in this zone should also be noted.
 - b. Dominance of cowpea in the Louga region and the northern part of the Diourbel region. In this zone, remittances are important due to the vulnerability of systems in which rainfall shortages have significantly reduced agricultural potential.
 - c. Dominance of peanuts, which make up the widest zone in the agro-pastoral domain, stretching from the Diourbel region to the Fatick, Kaolack and Kaffrine regions and through to the Kolda region.
 - d. An exclusively agricultural zone in the Nioro *département*, characterized by mixed farming and the introduction of cashews in the west as an addition to a system dominated by peanut production to promote an agroforestry system in the Foundiougne *département*.
2. A sylvo-pastoral system, which makes up the second largest area of land use, with the following variants:
 - a. The sylvo-pastoral zone is a very large, landlocked zone. With the development of infrastructure and markets, part of this sylvo-pastoral zone includes the Diéri area along the Senegal River.
3. An agro-sylvo-pastoral zone characterized by rainfall and forestry, which distinguishes it from the agro-pastoral system, with the following variants:
 - a. The agro-sylvo-pastoral system is found in the Tambacounda and Kédougou regions, which tend to be dominated by subsistence crops. This system is sometimes combined with artisanal mining (gold mining) in the gold-bearing basin of the Kédougou region.
 - b. The agro-sylvo-pastoral system dominated by peanut crops, which are found in the Kolda and Sedhiou regions.
 - c. The agro-sylvo-pastoral system dominated by cotton, which is found in the Vélingara *département* of the Kolda region.
4. A system based on agro-pastoral activities that are highly influenced by coastal activities, with the following variants:
 - a. An area located between Diamniadio and Diass where fruit production is the dominant activity, due to the nature of the soil.
 - b. An area characterized by the influence of tourism, which creates seasonal employment in the areas of Mbour, Saly, etc.
 - c. A mangrove system that generates fishery products and is also highly influenced by coastal activities such as tourism.
5. The irrigated system of Niayes, with two variants:

- a. One area located in the north, stretching from Kayar to the Gandon Rural Community in the Saint-Louis region. Horticulture and fishing are the dominant activities in this area.
 - b. A second area stretching from Kayar to the outskirts of Dakar, where the system – composed of dairy production, factory poultry farming and horticulture – is highly intensified. This peri-urban area is influenced by the Dakar market, which purchases its products for consumption and export. This activity is an important source of local employment.
6. Irrigated system in the Senegal River valley. This system is divided into two areas, distinguished by their degree of intensification:
- a. The zone from Saint-Louis to Podor, characterized by agribusiness led by the sugar, tomato and rice industries, etc. These factory activities constitute a stable source of local employment for households in this area.
 - b. In the second zone, which stretches from Podor to Bakel in the Bélé Rural Community, most households grow subsistence crops (irrigated and flood-recession crops) and, to a lesser extent, market garden products (tomatoes, onions) in areas close to the factories located in the first zone and the markets where these products are sold. In this part of the river valley, households depend largely on remittances in addition to agriculture.

After the zones were identified and characterized, regional workshop participants then identified different hazards and their degrees of importance. In most cases, drought topped the list of hazards. The importance of droughts could be linked to the large quantity of rain-fed crops and extensive transhumant livestock farming in the country. For agro-pastoral, sylvo-pastoral and agro-sylvo-pastoral systems, production activities are concentrated during the rainy season, which lasts from 2 to 5 months. After rainfall shortages, bush fires constitute the second largest hazard, given the extent of agro-sylvo-pastoral and sylvo-pastoral production systems. Other hazards exist, such as pests (insects and seed-eating birds), animal diseases, soil salination and alkalinization, groundwater salination, floods, land pressure, degradation of water resources (quality and quantity), advancing sand dunes, and rising sea levels for systems influenced by the coastline.

2. NATIONAL LIVELIHOOD ZONE MAP



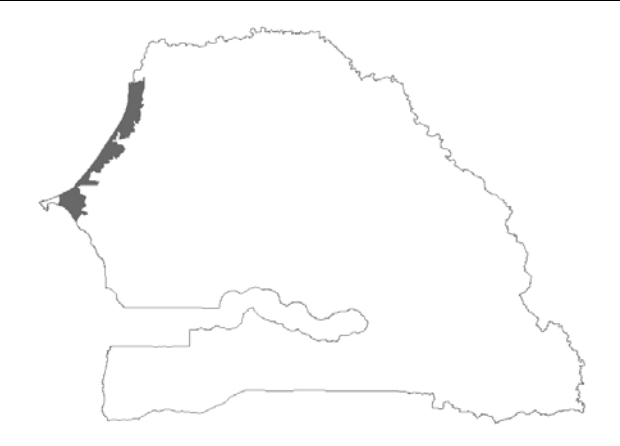
3. LIVELIHOOD ZONE DESCRIPTIONS

The zoning exercise determined different household livelihoods in view of agricultural changes that have strengthened system performance and internal or external migration strategies. The zone descriptions, developed according to information gleaned from regional workshops, CFSVA surveys and the SAP capacity-building workshop through the zoning exercise, give a better understanding of household livelihood characteristics.

Seasonal calendar legend			
Rain-fed crops	Preparation	Planting and weeding	Harvesting
Market gardens			
Fruit production			
Animal fattening			
Cattle/poultry sales			
Transhumant livestock farming	Departure	Arrival	
Sale and availability of milk			
Forestry			
Trade			
Local employment			
Economic migration			
Crafts			
Fishing (fishery products)			
Tourism			
Salt extraction			
Gold mining			

Figure: Seasonal Calendar Legend


Zone 1: Niayes Horticulture and Fishing Zone

Geographical boundaries	The Niayes strip, from Dakar to Rao (Sangalkam, Darou Khoudoss, Taïba Ndiaye, Notto Gouye Diama, Diender Guedj, Thieppe, Bandègne, Léona, Rao and Gandon Rural communities)		<p><u>Production system characteristics</u></p> <ul style="list-style-type: none"> • Market garden products produced year-round, especially in the agricultural off-season. • Water sources: shallow wells (<i>céanes</i>) and household connections to the Senegalese water company (SDE) network. • Surplus production; constitutes the majority of national production. • System uses family and agricultural workers (<i>sourghas</i>). • Intensive livestock farming/external labor force/predominance of poultry and dairy cattle. • Artisanal coastal fishing based on family labor. • Forestry (Bande de Filao). • Preparing, seeding, maintaining and harvesting all take place simultaneously in market gardens throughout the year.
Products consumed	Rice, millet, maize, fish.		
Products sold	Garden products, fruit, livestock products (eggs, poultry, milk), fishery products, salt.		
Types of livestock	Poultry, cattle, sheep and goats.		
Sources of household income	Salaries, sales of market gardening products, livestock sales and fishery product sales.		
Food sources	Market purchase, own production, fishing.		
Hazards/Risks	Difficult water access (quality and quantity), land pressure, plant pests, animal diseases, price speculation, drought, silting of gardening water sources, soil and groundwater salination.		
Main markets	Léona, Mboro, Fass Boye and Bayakh. Traders also come to buy products from the perimeter market gardens to sell in large markets in the urban and peri-urban zones (Thiaroye, Sandica de Pikine, Castor, Tilène, Gueule Tapée, Croisement Cambérène).		

Zone 1: Niayes Horticulture and Fishing Zone

Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December
Irrigated maize	█										█	
Onions	█									█		
Tomatoes	█									█		
Irrigated groundnuts		█										
Other vegetables	█											
Fruit production	█											
Forestry	█											
Cattle/poultry sales	█											
Fishing	█											
Petty Trade	█											
Migratory labor	█											
Local agricultural employment	█											█
Industrial and other employment	█											


Zone 2: Senegal River Valley Rice and Gardening Zone

Geographical boundaries	Ngnitt, Ronkh, Bokhol, Mbane, Fanaye, Ndiayène Pendaou, Guédé Village, Dodel, Syer and Keur Momar Sarr Rural communities		<p>Production system characteristics</p> <ul style="list-style-type: none"> • Irrigated, mechanized agriculture with surplus agricultural production. • Coexistence of family farms and agribusiness. Agribusiness (factory and large farms) employs a large number of local workers. • Extensive, sedentary livestock farming. Small herd sizes. • Agriculture more prevalent than livestock farming. • Sources of water include waterways (the river and its tributaries and derivatives), Lake Guiers and ponds. • Subsistence inland fishing is also practiced. • Hydro-agricultural development in Dagana. Village irrigation projects (PIV) in Podor.
Products consumed	Rice, sweet potato		
Products sold	Rice, tomatoes, onions, sweet potato		
Types of livestock	Sheep, goats, cattle		
Sources of household income	Farming (rice, tomatoes, onions and sweet potato), agricultural employment, fishing, remittances, livestock sales		
Food sources	Market purchase, own production		
Hazards/Risks	Soil salination and alkalinization, floods, grain-eating birds, land pressure, aquatic vegetation, isolated production areas, locusts.		
Main markets	Ross Béthio, Rosso Sénégal, Richard-Toll, Dagana, Bokhol		

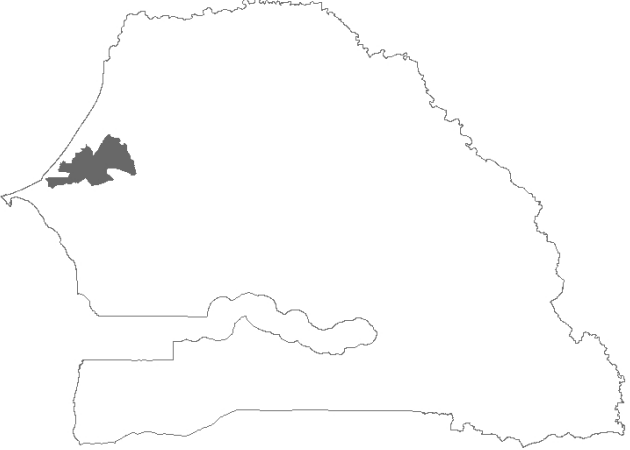
Zone 2: Senegal River Valley Rice and Gardening Zone

Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December
Off-season rice production	Green			Yellow						Grey		Green
Rainy season rice production						Grey	Green			Yellow		
Market gardening	Dark Green											
Flood-recession crops	Green		Yellow							Green		
Shoat and poultry sales	Brown											
Cattle sales							Brown					
Transhumant livestock rearing				Brown			Brown			Brown		
Trade	Grey											
Tourism	Yellow											Yellow
Fruit production	Light Green											
Agro-industrial employment	Blue											

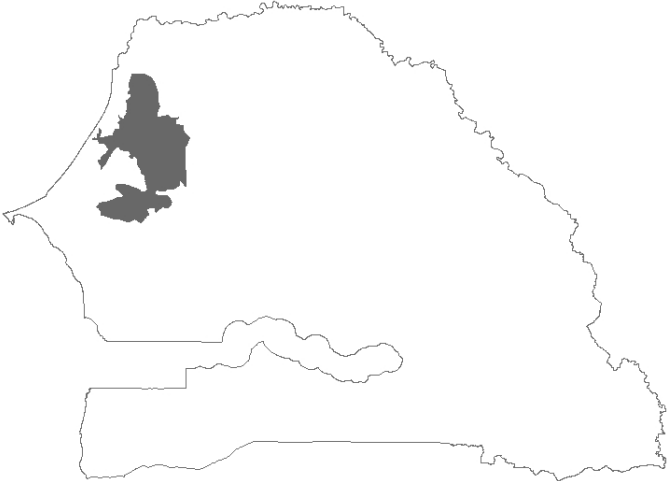
Zone 3: Senegal River Valley Out-migration and Remittance Zone

Geographical boundaries	<i>Walo</i> and some <i>Dieri</i> areas of Matam region, Podor <i>département</i> (Saint-Louis Region) and Moudéry and Bélé <i>arrondissements</i> (Tambacounda region).		<u>Production system characteristics</u> <ul style="list-style-type: none"> • Irrigated, mechanized subsistence and cash crop farming. • Flood-recession crops (sorghum and maize). • Surplus agricultural production. • Extensive transhumant livestock farming; medium-sized herds (50 to 100 heads). • Water sources: river, ponds and bore holes. • Agriculture more prevalent than livestock. • Subsistence fishing in the Senegal River. • Village irrigation projects (PIV) in Matam. • In this part of the valley (the <i>Daandé mayo</i>), paddy rice is sold to Mauritania on an individual and informal basis.
Products consumed	Rice, sorghum, maize		
Products sold	Rice, cowpea, potato, maize		
Types of livestock	Goats, sheep, cattle, poultry		
Sources of household income	Remittances, agriculture, livestock farming		
Food sources	Own production, market purchase.		
Hazards/Risks	Floods, locusts, grain-eating birds, drought, marketing problems for agricultural products.		
Main markets	Haéré Lao, Médina Ndiatbé, Galoya, Agnam Thiodaye, Orkadiéré, Bakel, Dahra, Linguère, Vélingara Ferlo, Lougré Thiolly, Keur Momar Sarr, Thillé Boubacar, Labgar, Yaré Lao, Ranérou, Touba, Tatki, Namarel, Niassanté, Diaglélé, Ndioum, Dodel, Galoya, Pété, Aéré Lao, Tarédji, Yonouféré, Naouré, Velingara, Thionokh, Dendoudi, Ourossogui, Oréfondé, Agname Civol, Thilogne, Bokidiawé, Ourossidy, Orkadiéré, Ndendori, Kanel, Bondié		


Zone 4: Agropastoral Cassava Zone

Geographical boundaries	Thiès and Tivaouane <i>departments</i> (Thiès Region), Keur Samba Kane rural community (Bambey Department of Diourbel region)		<p><u>Production system characteristics</u></p> <ul style="list-style-type: none"> • Rain-fed agriculture: animal traction for peanuts; manual labor for cassava. • Surplus cassava production harvested throughout the year. • Fruit production is beginning to expand. • Sedentary livestock breeding. Small herd sizes (fewer than 50 heads). • Water sources include bore holes and wells.
Products consumed	Rice, millet		
Products sold	Cassava, peanuts, cowpeas, watermelon, hibiscus		
Types of livestock	Shoats, poultry, cattle		
Sources of household income	Cassava sales, livestock, fruits, trade, crafts, remittances.		
Food sources	Purchase, own production		
Hazards/Risks	Drought, crop pests, cassava diseases, expansion of phosphate mines onto agricultural lands		
Main markets	Pire Gourèye, Thilmakha, Pékesse, Mékhé, Tivaouane, Keur Samba Kane, Baba Garage		

Zone 5: Agro-pastoral Cowpea Zone

Geographical boundaries	Louga region: Louga <i>département</i> (except the Keur Momar Sarr <i>arrondissement</i> and Léona Rural community (Niayes)), Kébémér <i>département</i> (except Niayes)		<u>Production system characteristics</u> <ul style="list-style-type: none"> • Deficit production area • Rain-fed farming using animal draft power. • Extensive transhumant livestock farming. Medium-sized herds. • Water sources for livestock farming are ponds, boreholes and wells.
Products consumed	Rice, millet, cowpea		
Products sold	Cowpea, peanuts, watermelon and hibiscus		
Types of livestock	Shoats, poultry		
Sources of household income	Remittances, farming, trade, livestock sales		
Food sources	Market purchase, own production		
Hazards/Risks	Drought, crop pests, soil degradation		
Main markets	Darou Mousty, Darou Marnane, Sagatta Ngeth, Kebemer, Guéoul, Louga, Ndande, Sakal, Niomré, Thiamène, Coki, Ndiagne, Sam Yabal, Gandé, Thiamène, Dinguiraye, Ndindy		

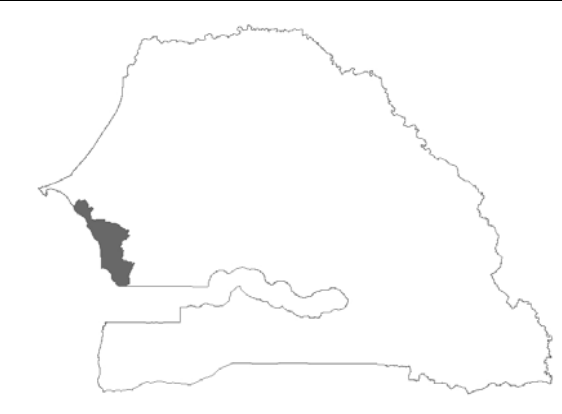
Zone 6: Sylvo-pastoral Zone


Geographical boundaries	Linguère and Haut Diéry <i>départements</i> in the Matam and Saint-Louis regions	 <p><u>Sylvo-pastoral zone / Diéri</u> Production systems in this sub-zone are the same as those in the sylvo-pastoral zone. However, this zone benefits more from basic social services. Markets are more accessible thus promoting trade. Other important source of income, such as crafts and remittances are also more prevalent.</p>	<p><u>Production system characteristics</u></p> <ul style="list-style-type: none"> • Extensive/ transhumant livestock farming stretching from the Ferlo to Boundoun regions. • Water sources: bore holes, wells, temporary ponds. • Large herd sizes- more than 50 heads. • Herding more prevalent than farming. • Strictly rain-fed subsistence agriculture. Manual labor. • Agricultural production deficit.
Products consumed	Rice, millet, milk, sorghum, cowpea, peanuts		
Products sold	Livestock, milk, wild food (gum arabic, jujube fruit, balanite fruit), food crops		
Types of livestock	Cattle, shoats, horses, donkeys, poultry		
Sources of household income	Sales of livestock and wild foods, trade, crop sales.		
Food sources	Market purchase, own production		
Hazards/Risks	Bush fires, drought, animal diseases, crop pests, cattle theft		
Main markets	Dahra, Linguère, Vélingara Ferlo, Lougré Thiolly, Keur Momar Sarr, Thillé Boubacar, Labgar, Yaré Lao, Ranérou, Touba, Tatki, Namarel, Niassanté, Diaglè, Ndioum, Dodel, Galoya, Pété, Aéré Lao, Tarédji, Yonouféré, Naouré, Velingara, Thionokh, Dendoudi, Ourossogui, Oréfondé, Agname Civol, Thilogne, Bokidiawé, Ourossidy, Orkadiéré, Ndendori, Kanel, Bondié		

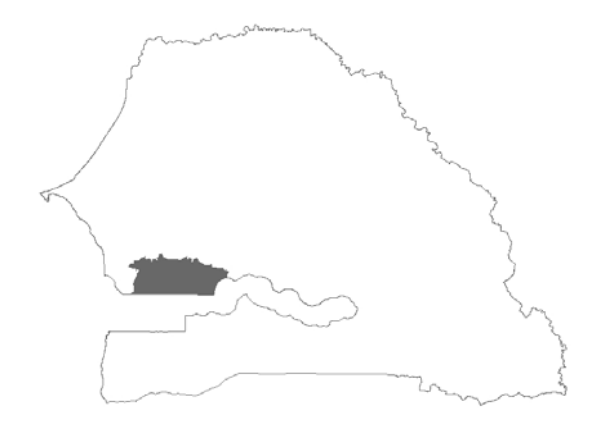
Zone 6: Sylvo-pastoral Zone

Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December
Cattle/poultry sales	[Dark Brown Bar]											
Milk sales								[Light Orange Bar]				
Transhumant livestock rearing							[Dark Brown Bar]				[Dark Brown Bar]	
Wild food gathering	[Green Bar]											
Petty trade	[Grey Hatched Bar]											
Millet						[Grey Bar]	[Bright Green Bar]		[Yellow Bar]			

Zone 7: Petite-Côte Fishing, Tourism and Arboriculture Zone

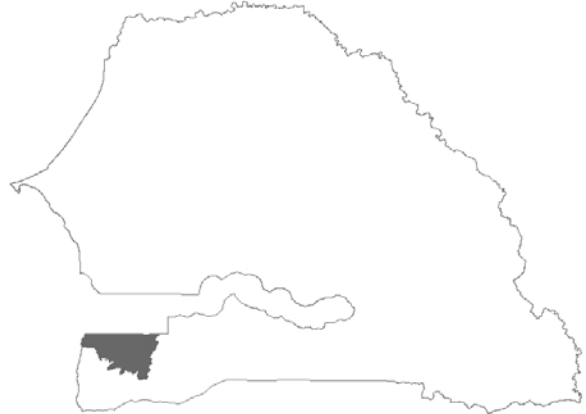
Geographical boundaries	Nguéniène, Malicounda, Sindia, Dionewar, Bassoul, Palmarin Facao, Fimela, Ndjirnda, Djilasse and Loul Sessene rural communities.		<p><u>Production system characteristics</u></p> <ul style="list-style-type: none"> • Artisanal coastal fishing using local labor. • Surplus fishery production. • Women engaged in craft production and wild food gathering. • Food crop production deficit area. • Rain-fed farming using animal draft power. • Subsistence rice production. • Extensive sedentary livestock farming. • Most common water sources are wells, waterways, boreholes and wells • Small herd sizes. • Highly developed tourism sector.
Products consumed	Rice, millet, fish, maize		
Products sold	Fish, forestry products, salt, peanuts, watermelon, cowpeas		
Types of livestock	Shoats, cattle, poultry		
Sources of household income	Local labor, fish sales, boat transportation, eco-tourism, crop sales, remittances, factory employment.		
Food sources	Market purchase, own production, fishing		
Hazards/Risks	Coastal erosion, mangrove degradation, silting of channel areas, soil salination, damage from loose livestock, animal diseases, cattle theft, drought, crop pests		
Main markets	Mbour, Nguédiene, Joal Fadiouth, Nguékhokh, Foundiougne, Diofior, Sokone, Foundiougne and Passy		

Zone 8: Agro-pastoral Peanut Zone			
Geographical boundaries	Kaolack, Fatick, Diourbel, Thiès, Kaffrine, Kolda, and Tambacounda regions (with the Thienaba and Notto <i>arrondissements</i> and Fandène, Fissel, Ndiaganio, Sandiara and Sessène Rural communities)		
Products consumed	Rice, peanuts, millet, maize, sorghum, cowpeas		
Products sold	Peanuts, millet, cowpeas, watermelon, salt, hibiscus, cotton, maize, sesame		
Types of livestock	Cattle, shoats, donkeys and horses, poultry, pigs.		
Sources of household income	Agriculture, livestock sales, trade, crafts, remittances, salt sales, horse-drawn transport, employment in Tamba		
Food sources	Market purchase, own production, wild food collection.		
Hazards/Risks	Drought, insect pests, animal diseases, cholera, bush fires, soil and groundwater salination, floods, land pressure, cattle theft, unseasonal rains, locusts, unsold stocks		
Main markets	Diourbel, Touba, Bambey Sérère, Kaolack, Sandiara, Touba Toul, Guinguinéo, Thiès, Mba Faye, Birkelane, Kouthiaba, Tambacounda, Médina Yoro Foulah, Fatick, Diouroup, Mbar, Diakhao, Gossas and Missirah, Ndiebel, Mboss Gandiaye, Toukar, Patar Sine, Niakhar, Ndiob, Diaoulé, Mbélacadio, Ndiéné Lagane, Colobane, Mbegue, Mabo, Gniby, Missira, Diamagadio, Mbelbouk, Guawane, Réfane, Ndérep, Lambaye, Dangualma, Ndongol, Ngoye, Keur Saer, Ndiagne, Ghohé, Lagnar, Guinguène Salaw, Keur Ngalou, Thiobé, Patar Ndoulo, Keur Ibra Yacine, Kael, Darou Salam TYP, Ndioumane, Touba Mboul, Pata, Medina Yoro Fula, Fafacourou		
			<u>Production system characteristics</u> <ul style="list-style-type: none"> • Rain-fed farming using animal draft power • Production deficit in the north (Thiès, Diourbel, Fatick and Kaolack) and normal to surplus production levels in the south (Kaffrine, Tamba and Kolda). • Extensive, sedentary livestock farming and transhumant livestock reception zone in the central and southern regions. • Medium-sized herds- livestock dominated by cattle. • Most common water sources are boreholes, ponds and wells in the northern and central regions while there are only ponds and wells in the south. • Extensive transhumant livestock farming in the north. Herd sizes are small (< 50 heads) in the north and medium in the south. • Inland subsistence fishing and shrimp sales in Kaolack and Fatick. • Crop farming more prevalent than herding. • Concentration of migratory herds during the dry season. • Non-farming activities such as crafts, trade and horse-drawn transport are important in this zone.

Zone 9: Agricultural Zone			
Geographical boundaries	Gainte Kaye, Keur Baka, Keur Socé, Keur Madiabel, Keur Maba Diakhou, Kayemor, Médina Sabakh, Ngayène, Ndrané Escale, Ndiendieng, Paoskoto, Prokhane, Taiba Niassène, Thiaré, Wack Ngouna, Diossong, Keur Samba Gueye, Keur Saloum Diane, Nioro Alassane Tall and Toubacouta rural communities		<u>Production system characteristics</u>
Products consumed	Rice, millet, maize, sorghum, peanuts, watermelons		<ul style="list-style-type: none"> • Rain-fed farming using animal draft power • Average level of agricultural production. • Semi-extensive, sedentary livestock farming. Horse stockbreeding. • Water sources for livestock are boreholes, temporary ponds and wells. • Subsistence inland fishing. • Forestry: artisanal and industrial. • Market gardening along the valleys.
Products sold	Peanuts, millet, maize, watermelons		
Types of livestock	Shoats, cattle, donkeys, horses, poultry		
Sources of household income	Farming, trade, crafts, livestock		
Food sources	Market purchase, own production		
Hazards/Risks	Floods, drought, bush fires, crop pests, locusts, salination, cattle theft, land pressure		
Main markets	Ndoffane, Dinguiraye (most influential), Nioro, Prokhane, Ndiba Ndiayène, Wack-Ngouna, Ndrané Escale, Keur Madiabel, Médina Sabakh, Mabo, Djoliy Mandakh, Nganda, Passi, Touba Mouride, Touba Ndick, Sokone		

Zone 9: Agricultural Zone

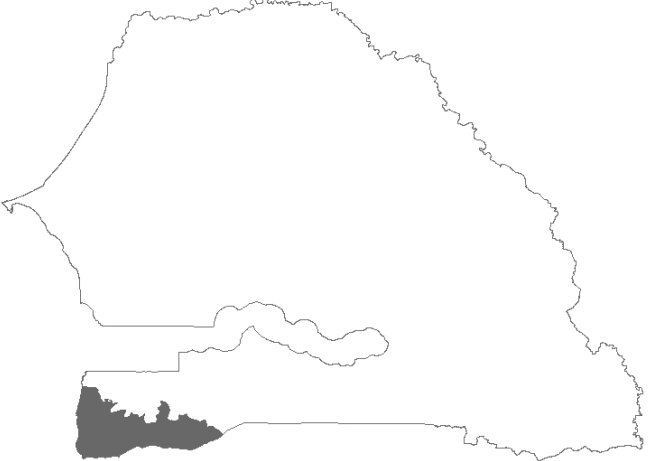
Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December	
millet, cowpea, watermelon													
Sorghum, groundnuts													
Maize													
Cattle/poultry sales													
Artisanal Products													
Baobab fruit gathering													
Cordyla fruit gathering													
Market gardening													
Trade													
Seasonal migration													
International migration													
Local labor													

Zone10: Food Crops and Forestry Zone			
Geographical boundaries	Diouloulou, Djinaki, Djibodione, Diégoune, Oulampane, Ounck, Suelle, Sindian and Tenghory rural communities		<u>Production system characteristics</u> <ul style="list-style-type: none"> • Rain-fed farming with partial use of animal draft power • Production deficit area. • Dominated by subsistence crops (rain-fed millet and rice). • Sale of forestry products important source of income. • Fruit production is another major economic activity in this zone.
Products consumed	Rice, millet, maize		
Products sold	Peanuts, millet, timber and non-timber forestry products		
Types of livestock	Cattle, shoats, poultry		
Sources of household income	Farming, wild food collection, craft sales		
Food sources	Market purchase, own production, wild food collection.		
Hazards/Risks	Insecurity, rainfall shortages, crop pests, cattle theft, cattle diseases		
Main markets	Bignona, Diouloulou		

Zone10: Food Crops and Forestry Zone

Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December	
Millet													
Maize													
Rain-fed rice production													
Groundnuts													
Forestry													
Cashew gathering													
Cattle/poultry sales													
Milk production													
Crafts													


Zone11: Agroforestry, Fishing and Tourism Zone

Geographical boundaries	Ziguinchor and Oussouye <i>départements</i> and Djibanan <i>arrondissement</i> (Goudomp <i>département</i>)		<u>Production system characteristics</u> <ul style="list-style-type: none"> • Rain-fed agriculture using manual labor • Deficit production (lowland rice production, cereal and horticulture production in plateau areas). • Fishing: river and sea. • Irrigated banana farming • River fishing (nets). • Local labor opportunities for gathering wild foods.
Products consumed	Rice, millet, maize, fish		
Products sold	Cashews, bananas, peanuts, wild fruit, fishery products (shrimp), other forestry products (palm oil)		
Types of livestock	Cattle, shoats, pigs		
Sources of household income	Farming (horticulture, peanuts), trade, sale of wild foods, salt sales, tourism		
Food sources	Market purchase, own production, wild food collection.		
Hazards/Risks	Salination, plant diseases, cross-border insecurity, mines, theft, floods, drought, food price inflation		
Main markets	Yarang, Djirédji, Tanaff, Diattacounda, Touba Mandingue, Ziguinchor and Cap Skiring		

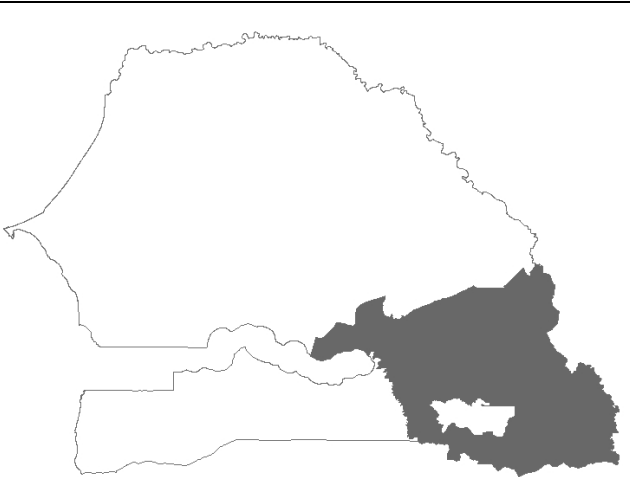
Zone11: Agroforestry, Fishing and Tourism Zone

Source of income/activity	January	February	March	April	May	June	July	August	September	October	November	December	
Rain-fed rice production													
Millet													
Maize													
Fruit production (bananas)													
Fruit production (mangoes)													
Forestry products													
Fishing													
Shellfish gathering													
Eco-tourism													
Local labor													

Zone 12: Agro-sylvo-pastoral Peanuts and Cotton Zone

Geographical boundaries	Tanaff, Niagha, Kolibantang, Karantaba, Diendé, Sansamba, Sakar, Diana Malari, Diaroumé, Bona, Bounkiling, Ndiamacouta, Linkiring, Paroumba, Koukané, Ouassadou, Mampatim, Coumbacara, Dabo, Bagadadji, Salikégné, Dioulacolon, Médina Elhadji, Tankanto Escale, Bonconto, Médina Gounass and Sinthiang Koundara rural communities.		<u>Production system characteristics</u> <ul style="list-style-type: none"> • Rain-fed farming: manual and animal draft power (mechanized in Anambé). • Extensive sedentary livestock farming. • Water sources for livestock are ponds and wells. • Forestry operations are developed in this zone. • Inland fishing also exists along waterways.
Products consumed	Millet, maize, rice, sorghum, fonio		
Products sold	Peanuts, cotton, maize, cashews, rice, fonio, cassava, sesame, timber and non-timber forestry products, wild game		
Types of livestock	Shoats, cattle, poultry, pigs		
Sources of household income	Cash crops, livestock sales, small businesses, fishing, forestry, remittances		
Food sources	Market purchase, own production.		
Hazards/Risks	Decreased rainfall, floods, fires, plant diseases, insecurity in the north (Bounkiling and Sakal)		
Main markets	Kolda, Diaobé, Bagadadji, Manda Douane, Saré Yoba, Témontie, Touba Mouride, Saré Alkaly, Keur Abib, Boughari, Bounkiling		

Zone 13: Agro-sylvo-pastoral Food Crops Zone

Geographical boundaries	Sinthiou Fissa, Dougue, Sadatou, Bani Israel, Kothiary, Dialakoto, Missirah, Nétéboulou, Ndogo Babacar, Maka Coulibantang and Sinthiou Malem Rural communities, Salémata <i>département</i> , Fongolembi <i>arrondissement</i> , Médina Baffé, Missirah Sirimana, Sabadola and Khossanto rural communities.		<p><u>Production system characteristics</u></p> <ul style="list-style-type: none"> • Rain-fed farming using animal draft power in the north; very little animal draft power in the south. • Extensive, sedentary livestock farming. • Water sources for livestock are wells and ponds. • Artisanal gold mining. • Forestry products (wild foods and charcoal). • Bananas are grown along the Gambia River.
Products consumed	Maize (Fulani peoples), sorghum (Malinké peoples), rice, fonio, peanuts, bush meat, wild fruit, sweet potato, millet		
Products sold	Gold, cotton and peanuts		
Types of livestock	Cattle, shoats, poultry (bartered)		
Sources of household income	Farming, gold sales, petty trade, livestock sales, forestry product sales		
Food sources	Market purchase, own production, hunting, wild food collection.		
Hazards/Risks	Bush fires, decreased rainfall, floods		
Main markets	Tambacounda, Missira, Ndogo Babacar, Kothiari, Bala, Goudiry, Haltou Fass, Payar, Kaforie, Thiokoye, Fongolémi, Mako, Dindifélo, Salemata. Gold is sold to buyers on site.		

