

## Agricultural Policy in the Maghreb during the Severan Era (193–235 CE)

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### Abstract

The Severan dynasty marked a transformative period in the agricultural development of Roman North Africa. Between 193 and 235 CE, the provinces of Africa Proconsularis, Numidia, and the Mauretanian territories experienced significant policy interventions that reshaped land tenure, production systems, and rural economies. This study examines the agricultural policies implemented under emperors Septimius Severus and Caracalla, situating these measures within broader imperial strategies of economic exploitation and provincial administration. Through an interdisciplinary methodology combining epigraphic evidence, archaeological survey data, legal texts, and palynological analysis, this research demonstrates that Severan agricultural policy in the Maghreb represented both continuity with earlier Antonine practices and distinctive innovations tied to the dynasty's North African origins and fiscal requirements. The period witnessed intensified efforts to convert marginal lands to agricultural production, expansion of imperial estate systems, modifications to tenant legislation, and infrastructure investments that facilitated the region's emergence as a dominant supplier of olive oil, cereals, and other commodities to Mediterranean markets. Understanding Severan agricultural policy requires careful attention to regional variation, the interplay between imperial directives and local implementation, and the contested nature of land exploitation in a landscape characterized by diverse ecological zones and competing economic interests.

**Keywords:** Maghreb; Septimius Severus; Caracalla; agriculture; economy.

### Introduction

The Severan dynasty (193–235 CE) presided over one of the most economically productive periods in the history of Roman North Africa. During these four decades,

the central and eastern Maghreb—encompassing the provinces of Africa Proconsularis, Numidia, and portions of Mauretania—consolidated their position as critical suppliers of agricultural commodities to Rome and broader Mediterranean markets (Stone, 2014, pp. 565–567). The intensification of olive oil production, expansion of cereal cultivation onto previously marginal lands, and development of complementary industries transformed the region's rural landscape and generated substantial wealth for both imperial authorities and provincial elites (Hobson, 2015, pp. 45–52). Yet scholarly understanding of the specific policy mechanisms that drove this transformation remains incomplete, with debates continuing over the extent to which imperial initiatives shaped local development versus endogenous economic forces.

The reign of Septimius Severus (193–211 CE) holds particular significance for North African agricultural history. As the first emperor of African origin, born in Leptis Magna in Tripolitania, Severus maintained close connections to the region throughout his reign (Haywood, 1940, p. 175). His successor Caracalla (211–217 CE as sole emperor) continued many of his father's policies while introducing innovations, most notably the *Constitutio Antoniniana* of 212 CE, which extended Roman citizenship throughout the empire and carried implications for land tenure and taxation (Kehoe, 1984, pp. 241–243). Understanding Severan agricultural policy requires examining not only imperial legislation and administrative structures but also the material evidence for changing patterns of land use, the evolution of estate management systems, and the ecological constraints that shaped production possibilities across the region's diverse bioclimatic zones.

## Definitions and Scope

### Geographic Parameters

This study focuses on the Maghreb provinces under Roman administration during the Severan period, with particular emphasis on Africa Proconsularis and Numidia, where evidence for agricultural policy and production is most abundant. Africa Proconsularis, established following the Third Punic War and substantially reorganized under Augustus, encompassed the fertile coastal plains and inland valleys of modern Tunisia and eastern Algeria (Stone, 2014, pp. 568–570). The province's diverse geography included the humid Tell zone in the north, characterized by winter rainfall and Mediterranean vegetation; the Tunisian Dorsal mountain range, where pine and oak forests provided timber and pasturage; and semi-arid steppe regions to the south, where specialized dry-farming techniques enabled cereal and olive cultivation (McCarty, 2022, pp. 570–575). Numidia, transformed from a client kingdom to a Roman province under Septimius Severus in 198 CE, encompassed the highlands and plateaus of central and eastern Algeria, regions with significant agricultural potential but requiring substantial infrastructure investment to realize productivity gains.

### Periodization

The chronological boundaries of this study (193–235 CE) correspond to the duration of Severan dynastic rule, beginning with Septimius Severus's victory over Pescennius Niger and ending with the assassination of Severus Alexander. This periodization reflects meaningful continuities in administrative personnel, policy orientations, and economic trajectories that distinguished the Severan era from preceding Antonine and subsequent Maximine periods (Haywood, 1940, pp. 176–177). Within this framework, particular attention is devoted to identifiable policy moments, including Severus's reorganization of North African frontier systems following the campaigns of 203 CE, Caracalla's citizenship edict of 212 CE and its fiscal implications, and the ongoing implementation of Hadrianic land legislation throughout the dynasty's tenure.

### **Historiography and Sources**

Scholarship on Roman North African agriculture has evolved considerably since the colonial-era studies that dominated the field through the mid-twentieth century. French colonial historians, working within frameworks that explicitly compared Roman and French "civilizing" missions, produced extensive documentation of archaeological sites and inscriptions while simultaneously imposing interpretive schemas that minimized indigenous agency and emphasized Roman technological superiority (McCarty, 2022, pp. 566–568). The foundational work of Haywood (1940) on Septimius Severus's African policy established key parameters for understanding Severan engagement with the region, arguing that the emperor's measures—including military reorganization, grants of *ius Italicum*, and municipal promotion—represented continuations of second-century precedents rather than favoritism toward his homeland (pp. 175–180).

More recent scholarship has adopted critical perspectives on colonial-era interpretations while expanding the evidentiary base through new archaeological surveys and scientific analyses. Stone (2014) demonstrated the significance of artificial port infrastructure for understanding North African economic connectivity and trade volumes, providing quantitative indicators of the region's integration into Mediterranean commercial networks (pp. 590–598). Hobson's (2015) comprehensive evaluation of the "African boom" model engaged critically with New Institutional Economics approaches, arguing that economic growth in the region disproportionately benefited elite landowners rather than producing broad-based improvements in living standards (pp. 156–164). McCarty (2022) challenged assumptions about environmental conditions in Roman Africa, demonstrating through palynological evidence and literary sources that extensive pine forests in the Tell and Dorsal zones provided critical economic resources, including timber, pitch for amphora-lining, and fuel (pp. 570–580).

Algerian scholarship has made important contributions to understanding agricultural systems and their social implications. Research published in Algerian academic journals has examined the implementation of Roman agricultural legislation, the exploitation of Numidian wheat production, and the establishment of frontier agricultural settlements (AMADJ, 2024, pp. 519–523). These studies have

emphasized the extractive dimensions of Roman agricultural policy and the displacement of indigenous populations from productive lands.

### Methods and Evidence

#### Epigraphic Sources

The foundation for understanding Severan agricultural policy rests substantially on epigraphic evidence, particularly the corpus of inscriptions relating to imperial estate management and tenant regulations. The *lex Manciana*, preserved in multiple North African inscriptions, established terms for tenant cultivation of imperial estates, including share-rent arrangements, labor service obligations, and provisions for converting uncultivated lands to agricultural use (Kehoe, 1984, pp. 245–250). Hadrianic supplements to these regulations, attested at Aïn el-Djemala, Aïn Wassel, and Henchir Mettich, provided modified terms encouraging conversion of "swamp and forest" (in *paludibus* et in *silvestribus*) to olive, vine, and cereal production (pp. 252–256). These inscriptions continued to govern estate management practices throughout the Severan period and offer detailed evidence for the mechanisms through which imperial authorities structured agricultural exploitation.

#### Archaeological Evidence

Archaeological survey data from regions including the Tunisian Tell, the Medjerda valley, and the Algerian high plains provide material evidence for changing settlement patterns and agricultural intensification during the Severan era. The proliferation of rural sites equipped with olive-pressing installations, the construction of hydraulic infrastructure for irrigation and water storage, and modifications to field systems indicate substantial investment in agricultural production capacity (Stone, 2014, pp. 572–575). Ceramic evidence, particularly the distribution patterns of African amphorae used for olive oil and wine transport, enables reconstruction of production volumes and export patterns. The dominance of African Red Slip pottery in Mediterranean markets from the late second century onward provides additional indicators of the region's economic trajectory during the Severan period.

#### Palynological and Environmental Data

Recent palynological studies have transformed understanding of North African environmental conditions and vegetation patterns during the Roman period. Pollen sequences from lagoons, lakes, and offshore sediment cores reveal the extent of forest cover, document deforestation associated with agricultural expansion, and identify regional variations in vegetation and land use (McCarty, 2022, pp. 582–590). These data challenge earlier assumptions about environmental conditions and resource availability, demonstrating that substantial pine and oak forests persisted in the Tell and Dorsal zones throughout the Severan period, providing timber, fuel, and other forest products that supported agricultural and industrial activities.

#### Legal Texts

Roman legal compilations, particularly passages preserved in the *Digest*, provide evidence for agricultural legislation and its evolution during the Severan period. Jurists active under Severan emperors, including Papinian, Ulpian, and Paul,

addressed questions of land tenure, water rights, tenant obligations, and estate management in their writings (Kehoe, 1984, pp. 258–260). While these legal texts rarely refer explicitly to North African conditions, they illuminate broader frameworks within which provincial agricultural policy operated and offer insight into contested issues requiring judicial clarification.

### **Political-Administrative Context**

#### **Septimius Severus and African Reorganization**

Septimius Severus's African origins profoundly shaped perceptions of his engagement with the region, though scholarly consensus holds that his policies toward North Africa represented pragmatic imperial administration rather than provincial favoritism (Haywood, 1940, pp. 175–178). Upon consolidating power following the civil wars of 193–197 CE, Severus undertook substantial reorganization of North African provincial administration. The transformation of Numidia from a legionary command attached to Africa Proconsularis to an independent province in 198 CE reflected both military-strategic considerations related to frontier security and administrative rationalization aimed at more effective exploitation of the region's agricultural resources (pp. 178–180).

The emperor's attention to North African frontier systems carried direct implications for agricultural development. Expansion and fortification of the limes Tripolitanus and construction of new defensive installations in southern Numidia created security conditions that enabled agricultural colonization of previously marginal zones (AMADJ, 2024, pp. 521–523). Military units stationed along frontier zones participated in hydraulic engineering projects, constructing dams, cisterns, and irrigation channels that supported agricultural production in semi-arid environments. Severus's grants of colonial status to North African municipalities, including his birthplace Leptis Magna, conferred tax privileges and enhanced these communities' ability to attract investment in rural infrastructure and agricultural development (Haywood, 1940, pp. 180–182).

#### **Caracalla and Citizenship Extension**

Caracalla's Constitutio Antoniniana of 212 CE, which extended Roman citizenship to virtually all free inhabitants of the empire, carried significant implications for North African agricultural systems, though scholarly debate continues over the edict's precise motivations and effects. Extension of citizenship altered the legal status of many tenant farmers and agricultural laborers, potentially modifying their obligations and rights within estate management systems (Kehoe, 1984, pp. 241–243). The fiscal dimensions of citizenship extension—particularly the subjection of newly enfranchised populations to inheritance taxes and other civic obligations previously limited to citizens—provided imperial authorities with enhanced mechanisms for extracting revenue from agricultural surplus (Haywood, 1940, p. 183).

Caracalla's brief sole reign (211–217 CE) saw continuation of infrastructure investment in North African provinces, including construction and repair of roads facilitating movement of agricultural commodities from interior production zones to

coastal ports. The emperor's focus on military affairs and frontier security maintained conditions favorable to agricultural production and export, though his fiscal demands on provincial populations to fund military campaigns created tensions between imperial revenue requirements and local economic sustainability. The administrative continuities linking Caracalla's reign to that of his father and subsequently to Severus Alexander's rule (222–235 CE) justify treating the Severan period as a coherent phase in North African agricultural development, characterized by consistent policy orientations even amid dynastic instability and succession crises.

### **Land tenure and taxation regimes**

The transformation of land tenure systems under the Severan dynasty represented a decisive shift in the economic architecture of the Maghreb provinces, one that built upon existing Republican-era frameworks while introducing mechanisms designed to maximize imperial revenues and secure military provisioning networks. The sprawling imperial estates (*saltus*) of Africa Proconsularis and Numidia operated under lease arrangements that fundamentally structured agricultural production across the region, with the *lex Manciana* and subsequent *lex Hadriana* establishing tenure conditions that bound cultivators to marginal lands while extracting predetermined shares of harvests (Kehoe, 1988, pp. 34-67). These regulatory frameworks permitted tenant farmers (*coloni*) to occupy uncultivated portions of imperial domains, retaining two-thirds of produce from tree crops and one-third from cereal cultivation, while conductors—intermediate lessees who managed estate operations—collected rents and coordinated production schedules (Kehoe, 1988, pp. 89-112). The Severan administration intensified surveillance of these arrangements, as evidenced by inscriptions from the Bagradas valley estates documenting disputes between imperial procurators and tenant communities over labor obligations and water access rights (Mattingly & Hitchner, 1995, pp. 187-191).

Taxation regimes evolved substantially during this period, with Septimius Severus implementing reforms that shifted fiscal burdens while rewarding military loyalty through land grants and municipal promotions. The traditional tribute system—comprising the *stipendium* levied on provincial communities and the *scriptura* grazing tax collected from pastoral populations—underwent modification as the emperor expanded the *annona militaris*, a requisition system initially designed for frontier garrisons but progressively extended to supply urban populations (Shaw, 1995, pp. 145-167). Africa Proconsularis bore substantial obligations under this arrangement, with communities compelled to deliver fixed quantities of grain, olive oil, and livestock to imperial warehouses at predetermined prices that frequently fell below market valuations (Shaw, 1995, pp. 178-189). The creation of Numidia as a separate province under Septimius Severus in 198 CE—carved from the southern portions of Africa Proconsularis and placed under a legionary legate commanding the Third Legion Augusta—reflected strategic imperatives to consolidate military authority over grain-producing highlands and to streamline tax collection in zones

previously administered through the proconsular apparatus (Mattingly & Hitchner, 1995, pp. 169-172).

### **Military Colonies and Veteran Settlement**

The establishment of veteran colonies constituted a central mechanism for securing imperial control over strategic territories and extending cultivation into previously underutilized zones throughout Mauretania Caesariensis and Numidia. Severan-era foundations built upon Flavian and Trajanic precedents, with settlements such as Thamugadi (modern Timgad) and Cuicul (Djemila) serving as models for subsequent colonization efforts that integrated demobilized legionaries into agricultural economies while creating militarized surveillance networks along the southern frontier (Fentress, 1979, pp. 71-94). These colonies received carefully surveyed land allotments—typically ranging from 50 to 200 iugera per veteran depending on rank and length of service—distributed through centuriation schemes that imposed geometric order on landscapes and facilitated tax assessment (Fentress, 1979, pp. 103-118). Archaeological investigations at Rapidum (Sour El-Ghozlane) and Auzia (Sour Djebab) in present-day Algeria have documented the physical transformation accompanying veteran settlement, with excavations revealing fortified perimeters constructed in the 160s CE that enclosed mixed civilian-military populations, alongside Latin inscriptions commemorating construction projects funded jointly by retired soldiers and indigenous Mauri communities (Sayah, 2024, pp. 197-203).

The economic impact of these settlements extended well beyond their immediate agricultural output, as colonies functioned as market centers that stimulated regional exchange networks and promoted technological diffusion. Veterans introduced Mediterranean cropping systems—particularly arboriculture focused on olive cultivation—that required substantial capital investment in terracing, irrigation infrastructure, and processing facilities, thereby creating demand for skilled labor and fostering vertical integration between agricultural production and commercial export (Fentress, 1979, pp. 135-149). The proliferation of olive presses documented across the Numidian highlands and the Mauretanian coastal plains during the late second and early third centuries correlates spatially with zones of veteran settlement, suggesting that demobilized soldiers possessed both the financial resources and technical knowledge necessary to establish capital-intensive olive monoculture (Mattingly & Hitchner, 1995, pp. 201-208). Caracalla's extension of Roman citizenship through the Constitutio Antoniniana in 212 CE further integrated provincial populations into imperial frameworks, though debates persist regarding whether this measure primarily served fiscal objectives by expanding the tax base or reflected broader policies of social incorporation (Mattingly & Hitchner, 1995, pp. 172-174).

### **Irrigation Systems and Hydraulic Infrastructure**

Water management systems represented the material foundation for agricultural intensification across the semi-arid zones of the Maghreb, with Roman authorities adapting and expanding indigenous hydraulic technologies rather than imposing

entirely novel methods. Archaeological surveys in the Tunisian high steppe and the Algerian Hautes Plateaux have identified extensive networks of check dams (barrages), diversion weirs, and hillside terracing that collected seasonal runoff and distributed water to field systems through carefully calibrated gravity-fed channels (Leone, 2012, pp. 389-403). The evidence demonstrates considerable continuity with pre-Roman practices, particularly in the deployment of *seguias*—earthen canals that transported water from perennial springs to cultivated plots—and the construction of underground galleries (foggara systems) that tapped groundwater reserves in piedmont zones (Leone, 2012, pp. 404-417). Roman intervention typically manifested through administrative regulation rather than technological innovation, with legislation codified in the Albertini Tablets establishing water-sharing protocols and adjudicating disputes between upstream and downstream users according to principles that balanced customary rights with imperial requirements for predictable agricultural yields (Leone, 2012, pp. 418-425).

The integration of irrigation infrastructure with imperial estate management created complex institutional arrangements that shaped both ecological outcomes and social relations. On the great *saltus* of the Bagradas valley, estate regulations specified tenant obligations to maintain hydraulic installations, requiring *coloni* to contribute labor for canal dredging and dam repair as part of their lease conditions (Kehoe, 1988, pp. 134-156). These provisions generated recurring conflicts documented in second- and third-century inscriptions, with tenant communities petitioning imperial authorities against conductors who allegedly diverted water to favored cultivators or imposed excessive maintenance burdens (Kehoe, 1988, pp. 167-183). The archaeological record from the Kasserine survey region reveals that irrigation systems underwent expansion during the Severan period, with new construction concentrated in upland zones where terracing permitted cultivation of previously marginal slopes (Leone, 2012, pp. 426-435). This expansion corresponded temporally with increased military presence along the southern frontier, suggesting coordination between hydraulic development and strategic imperatives to provision garrison settlements and secure hinterland populations against pastoral incursions (Leone, 2012, pp. 441-448).

### **Storage Infrastructure and Logistical Networks**

The elaborate storage infrastructure that facilitated grain collection, preservation, and redistribution constituted an essential component of the provincial economy, with warehouses (*horrea*) serving as nodes in supply chains that linked rural production zones to urban consumption centers and military installations. Coastal cities throughout Africa Proconsularis and Mauretania Caesariensis developed specialized port facilities equipped with granaries designed to handle massive throughput during harvest seasons, when agricultural surplus moved from interior collection points to Mediterranean shipping lanes (Vitelli, 1980, pp. 54-68). Archaeological investigations at Ostia and Portus—the primary receiving ports for African grain destined for Rome—have documented warehouse complexes with storage capacities

exceeding 60,000 cubic meters, featuring raised floors to prevent moisture damage, internal courtyard spaces for sorting and measuring, and direct access to quays where cargo vessels could discharge African amphorae and bulk grain shipments (Vitelli, 1980, pp. 69-89). These installations reflect the organizational sophistication required to manage the *annona* system, which by the Severan period supplied approximately 200,000 tons of African grain annually to sustain Rome's population (Vitelli, 1980, pp. 92-106).

Within the African provinces themselves, *horrea* networks structured the spatial organization of agricultural production and taxation. Inscriptions and structural remains document public warehouses in major inland centers such as Thugga (Dougga), Sicca Veneria (El Kef), and Cirta (Constantine), where municipal authorities supervised grain collection from surrounding territories and transferred requisitioned quantities to imperial procurators responsible for onward shipment (Mattingly & Hitchner, 1995, pp. 193-197). The construction boom in warehouse facilities during the late second and early third centuries—evident in building inscriptions dated to the reigns of Septimius Severus and Caracalla—corresponds with intensified imperial demands for African grain following disruptions to Egyptian supply routes during the civil wars of 193-197 CE (Mattingly & Hitchner, 1995, pp. 198-202). Private storage facilities also proliferated during this period, particularly on large estates where landowners accumulated reserves to buffer against harvest variability and to capitalize on price fluctuations in regional markets (Kehoe, 1988, pp. 217-234).

### **The *Annona* and Provincial Provisioning**

The *annona* system evolved from an *ad hoc* requisitioning mechanism into a regularized institution that fundamentally structured economic relationships between the African provinces and the imperial center, with Severan reforms expanding its scope and intensifying extraction rates. Originally conceived to supply the city of Rome with subsidized grain distributions, the *annona civica* operated alongside the *annona militaris*, which provisioned frontier armies through compulsory purchases at fixed prices (Shaw, 1995, pp. 201-218). *Africa Proconsularis* shouldered disproportionate obligations under both systems, contributing an estimated two-thirds of Rome's grain requirements by the early third century while simultaneously supplying the Third Legion Augusta and auxiliary units stationed along the Numidian and Mauretanian frontiers (Shaw, 1995, pp. 223-237). This dual burden created structural vulnerabilities in regional food security, as imperial requisitions diverted production away from local consumption and commercial trade, generating periodic shortages in African cities despite the provinces' reputation as the empire's granary (Shaw, 1995, pp. 241-253).

Caracalla's military policies amplified these pressures through expanded army pay and increased troop deployments, necessitating higher extraction rates that provincial populations experienced as intensified fiscal exploitation. The emperor's campaigns in Germania and Parthia during the 210s CE drew heavily on African resources, with

surviving papyrological evidence from Egypt documenting requisition orders for North African olive oil, garum, and dried meat to supplement grain shipments (Mattingly & Hitchner, 1995, pp. 174-176). Coastal Mauretania Tingitana occupied a distinctive position within this system, exporting timber, purple dye, and exotic animals for arena spectacles while importing grain from Mauretania Caesariensis and Baetica to offset local production shortfalls in its mountainous interior (Havlikova, 2022, pp. 312-328). The province's three colonial foundations—Iulia Constantia Zilil, Iulia Valentia Banasa, and Iulia Campestris Babba—functioned primarily as administrative and commercial centers rather than agricultural colonies, reflecting adaptation to regional environmental conditions that favored pastoralism and exploitation of forest resources over intensive cereal cultivation (Havlikova, 2022, pp. 334-349).

### **Market Integration and Trade Networks**

The economic prosperity of North Africa under Septimius Severus and Caracalla relied fundamentally on sophisticated market integration and extensive maritime trade networks that connected provincial production centers to Mediterranean-wide demand. Archaeological evidence from artificial port structures demonstrates the scale of this connectivity, with twenty-nine definite port installations identified between Cyrenaica and Mauretania Tingitana serving as critical nodes for agricultural exports (Stone, 2014, pp. 565-567). These infrastructural investments reflected the strategic importance of North African grain, olive oil, and other commodities within imperial supply chains. The ports at Leptis Magna, Carthage, and smaller harbors throughout the region facilitated the movement of bulk agricultural goods, while inland transport networks linked agricultural estates in the Bagradas Valley and Numidian plains to coastal shipping points (Kehoe, 1988, pp. 7-12). The integration of these networks during the Severan period represented a culmination of earlier investments, as the dynasty's African origins encouraged particular attention to optimizing commercial flows from their homeland provinces.

The mechanics of market integration depended on both state-sponsored infrastructure and private commercial initiatives operating within frameworks established by imperial administration. Septimius Severus expanded harbor facilities and maintained road networks that reduced transaction costs for merchants transporting agricultural surpluses to urban markets (Stone, 2014, pp. 580-585). Evidence from estate inscriptions in the Bagradas Valley reveals that coloni on imperial estates produced not merely for subsistence but for regional and Mediterranean markets, responding to price incentives transmitted through established trade channels (Kehoe, 1988, pp. 154-163). The Severan fiscal system collected taxes in kind from African provinces, particularly grain, which was then redistributed to Rome and military garrisons, creating reliable demand signals that encouraged surplus production. This institutional framework allowed private entrepreneurs—shipowners, merchants, and warehouse operators—to piggyback on state logistics, effectively subsidizing private trade through guaranteed cargo volumes (Erdkamp, 2005, pp. 206-235).

The intensity of commercial exchange varied considerably across North African provinces, with Africa Proconsularis demonstrating the most developed market integration due to its proximity to Carthage and dense network of estates producing olive oil and wheat for export. Numidia and Mauretania Caesariensis exhibited more limited connectivity, though archaeological remains from the desert margins reveal Roman efforts to extend agricultural zones and integrate pastoral communities into exchange networks (Amadj, 2024, pp. 519-522). The Garamantes and other Saharan groups participated in medium-distance trade that brought dates, livestock, and potentially enslaved persons northward while distributing Roman manufactured goods and agricultural tools southward (Wilson, 2012, pp. 411-419). These multi-scalar networks—local, regional, and trans-Mediterranean—created overlapping systems of exchange that reinforced economic integration while accommodating diverse production regimes and ecological constraints across the Maghreb's varied landscapes.

### **Price Signals and Distribution**

The functioning of grain markets across the Roman Mediterranean during the Severan period reveals patterns of price formation that reflect both market integration and persistent transportation costs. Analysis of wheat prices from locations throughout the empire demonstrates that prices were consistently lower in producing regions distant from Rome, with price differentials correlating almost proportionally to distance from the imperial capital (Kessler & Temin, 2007, pp. 137-142). This pattern suggests that North African grain prices were determined not solely by local supply and demand but by empire-wide market conditions, with Rome serving as the primary price-setting center where excess supplies met concentrated demand. The negative price differential between African provinces and Rome reflected the cost of maritime transport, which, though lower than land transport per unit distance, still created significant spatial price variations across the Mediterranean basin.

These price signals influenced production decisions on North African estates during the Severan period, as landowners and tenant farmers allocated resources between grain cultivation, olive production, and other crops based on expected returns. The imperial administration's collection of taxes in kind at rates around ten percent of production, with relief during harvest failures, maintained relatively predictable fiscal burdens that did not severely distort market incentives (Kehoe, 1988, pp. 177-182). Sharecropping arrangements documented in estate inscriptions from the Bagradas Valley reveal that coloni paid portions of their harvest to conductores (estate managers), creating risk-sharing mechanisms that encouraged investment in permanent crops like olive trees while maintaining grain production for tax obligations and market sale. The Severan emphasis on olive cultivation, driven by growing Mediterranean demand for olive oil in manufacturing, lighting, and hygiene, generated price premiums that reoriented agricultural investment toward tree crops in suitable ecological zones (Amadj, 2024, pp. 523-526).

Distribution networks channeled North African production through hierarchical market systems that connected rural estates to urban consumption centers. Grain moved from individual farms to collection points managed by conductores, then to port warehouses controlled by merchants and shippers operating under state contracts or independently. At Rome, elaborate distribution systems involving horrea (warehouses), grain dealers, and bakers transformed imported wheat into bread for urban consumers, including recipients of the state grain dole (Erdkamp, 2005, pp. 236-258). The efficiency of these distribution chains varied seasonally with shipping conditions, creating periodic scarcities despite overall supply adequacy, as the slow pace of preindustrial transportation prevented rapid responses to localized shortages. North African ports developed specialized facilities for storing and loading agricultural commodities, with amphora production centers located near olive-processing installations to minimize transport costs for this valuable export (Stone, 2014, pp. 585-590).

### **Rural-Urban Dynamics**

The relationship between rural agricultural zones and urban centers in Severan North Africa reflected complex patterns of economic complementarity, population movement, and resource extraction that shaped regional development trajectories. The proliferation of cities across Africa Proconsularis and Numidia during the second and third centuries created concentrated demand for agricultural surpluses, labor services, and raw materials that stimulated intensification of rural production systems (Kehoe, 1988, pp. 12-20). Urban populations required regular provisioning with grain, olive oil, wine, and other foodstuffs, creating markets that absorbed production from surrounding countryside while providing manufactured goods, craft services, and administrative functions that supported rural society. The expansion of olive cultivation under the Severan dynasty particularly benefited from urban demand for processed oil, as pressing installations proliferated in rural territories supplying both local urban markets and Mediterranean export trade.

Yet this rural-urban integration involved asymmetric power relations that often disadvantaged indigenous populations and small-scale cultivators. The extension of Roman agricultural systems into the Numidian high plains and desert margins displaced pastoral groups from traditional grazing territories, forcing economic transformations that undermined existing livelihoods even as aggregate production increased (Amadj, 2024, pp. 526-528). Archaeological evidence from the Aurès region reveals that Roman reclamation of steppe zones for olive and grain cultivation concentrated land ownership among estate holders connected to imperial administration and urban elites, creating dependencies that channeled rural surplus toward cities and coastal export points. The coloni working imperial estates occupied ambiguous positions within these hierarchies, possessing security of tenure and legal protections that distinguished them from enslaved laborers while remaining subordinate to conductores who controlled access to land and determined production quotas.

Urban centers in North Africa served not merely as consumption nodes but as administrative and commercial hubs that organized regional economic activity. Cities like Carthage, Cirta, and Thugga housed officials managing imperial estates, merchants arranging export shipments, and craftsmen producing agricultural implements, amphorae, and other manufactured goods required by rural producers (Wilson, 2012, pp. 420-426). The development of market towns in agricultural zones facilitated exchange between rural producers and urban consumers, creating intermediate scales of economic organization that reduced transaction costs and enabled specialization. Under Septimius Severus and Caracalla, investment in urban infrastructure—including aqueducts, public buildings, and roads—signaled imperial favor and reinforced the political loyalty of provincial elites who benefited from positions mediating rural-urban exchanges. This pattern of urban development, concentrated particularly in the more heavily Romanized coastal and northern zones, created regional disparities in connectivity and prosperity that persisted throughout the Severan period.

### **Comparative Synthesis Across Provinces**

Significant variations in economic development characterized the North African provinces during the Severan period, reflecting differences in ecological conditions, urbanization patterns, and integration into imperial administrative and commercial networks. Africa Proconsularis, the most densely urbanized and longest-Romanized province, exhibited the highest levels of market-oriented agricultural production, with extensive villa estates producing olive oil and grain for Mediterranean export markets (Kehoe, 1988, pp. 100-112). The province's advantageous position along major maritime routes connecting the eastern and western Mediterranean, combined with the presence of Carthage as a major commercial entrepôt, facilitated the export of agricultural commodities and the import of manufactured goods, creating economic dynamism that enriched landowners and supported substantial urban populations. Imperial estates in the Bagradas Valley exemplified intensive cultivation regimes that employed complex tenure arrangements, irrigation systems, and permanent crops to maximize productivity and revenue.

Numidia demonstrated more heterogeneous patterns of development, with fertile plains in the north supporting grain and olive production comparable to Africa Proconsularis while highland and pre-desert zones retained more extensive agricultural systems combining cultivation with pastoralism. The abundance of water resources in valleys adjacent to the Aurès Mountains enabled Roman agricultural expansion during the first and second centuries, though this expansion frequently displaced indigenous populations and reconfigured local economies (Amadj, 2024, pp. 527-529). Cities in Numidia developed as administrative centers and military posts, with less intensive commercial activity than their counterparts in Africa Proconsularis, though archaeological evidence reveals significant olive oil production and export from certain regions. The province's role as a military frontier zone meant that

garrison supply represented an important component of agricultural demand, supplementing civilian urban markets.

Mauretania Caesariensis and Mauretania Tingitana remained more peripheral to Mediterranean trade networks despite possessing productive agricultural zones and ancient urban centers. Western Mauretanian cities received Roman legal status considerably later than eastern counterparts, and epigraphic evidence suggests weaker integration into provincial and empire-wide networks (Stone, 2014, pp. 591-595). Yet recent archaeological work challenges earlier assumptions that these western provinces remained isolated from Mediterranean commerce, revealing amphora production sites and export activity that connected Mauretanian olive oil producers to broader markets. The distances involved in maritime transport to Rome and other major consumption centers created cost disadvantages for western producers, though regional markets in Hispania and Gaul absorbed some production. Saharan trade networks extended from all North African provinces, with Mauretania Tingitana participating in Atlantic coastal exchanges that supplemented Mediterranean-focused commerce (Wilson, 2012, pp. 427-433).

### **Implications for Economic Development**

The agricultural economy of North Africa under Septimius Severus and Caracalla generated substantial surpluses that supported urbanization, funded military establishments, and contributed significantly to imperial fiscal resources, yet the developmental implications of this economic performance remain contested among scholars. The expansion and intensification of agricultural production during the Severan period created wealth that manifested in monumental urban architecture, elaborate rural villa complexes, and extensive infrastructure investments that improved transportation and water supply (Kehoe, 1988, pp. 105-112). These developments suggest genuine economic growth rather than merely redistributive extraction, as investments in permanent crops, irrigation facilities, and processing installations represented capital accumulation that enhanced productive capacity. The legal framework governing tenant rights on imperial estates, which the Severan administration maintained and occasionally strengthened through favorable rulings, provided security that encouraged long-term investment by coloni in land improvements and tree crops.

However, the distributional consequences of Severan agricultural policy and economic structure created winners and losers in ways that shaped subsequent trajectories. Indigenous populations in Numidia and Mauretania often experienced displacement and loss of access to pastoral resources as Roman agricultural systems expanded into marginal zones, undermining traditional livelihoods even as aggregate production increased (Amadj, 2024, p. 528). The concentration of land ownership within imperial estates and large private holdings limited opportunities for independent smallholders, creating dependencies on conductores and estate administration that constrained economic mobility. The orientation of production toward export markets and state taxation meant that harvest failures or disruptions to

Mediterranean shipping could create severe hardships for local populations, as price signals prioritized distant over local demand. These structural features of the Severan economy, while generating impressive surplus production in favorable conditions, created vulnerabilities that became evident during subsequent periods of political instability and climatic stress.

The relationship between state intervention and market development in Severan North Africa illuminates broader questions about ancient economic performance. The imperial administration actively shaped economic activity through taxation in kind, maintenance of transport infrastructure, enforcement of legal frameworks governing tenure and contracts, and direct management of imperial estates (Erdkamp, 2005, pp. 230-245). These interventions created institutional conditions conducive to market exchange while also distorting resource allocation toward state priorities, particularly grain supply for Rome and military garrisons. Private commercial actors operated within this framework, responding to price incentives and exploiting opportunities created by state demand, yet constrained by imperial policies and administrative practices. The resulting economy exhibited characteristics of both market integration—as evidenced by price correlations across Mediterranean space—and administered redistribution through taxation and state logistics.

### **Limitations of Evidence**

Reconstructing the agricultural economy of North Africa under the Severan dynasty confronts significant evidentiary constraints that necessitate cautious interpretation and acknowledgment of persistent uncertainties. The documentary evidence, consisting primarily of inscriptions from imperial estates, provides detailed information about tenure arrangements and conflicts between coloni and conductores but represents only a narrow segment of agricultural organization, likely atypical of conditions on private estates and in areas beyond imperial control (Kehoe, 1988, pp. 20-27). The geographic concentration of estate inscriptions in the Bagradas Valley limits generalization to other regions with different ecological conditions, urbanization patterns, and distances from major ports. Literary sources from the Severan period offer limited attention to agricultural matters, focusing instead on political and military affairs, while papyrological evidence abundant for Roman Egypt remains scarce for North Africa.

Archaeological approaches provide complementary evidence through survey identification of rural settlements, excavation of villa complexes and processing installations, and analysis of amphora distributions indicating export patterns, yet these methods also face interpretive challenges. The dating of archaeological remains to specific reigns within the Severan period remains imprecise given the relatively short duration of individual rules and the continuation of ceramic types across generational boundaries (Stone, 2014, pp. 567-570). Survey evidence reveals settlement patterns and installation densities but cannot directly measure production volumes, labor arrangements, or market relationships without supplementary documentary sources. The differential preservation and archaeological investigation

of regions creates geographic biases, with coastal zones and areas around major cities receiving more attention than interior and desert-margin territories where Roman expansion during the Severan period may have been particularly significant.

Quantification of economic performance—including total production, productivity per worker or per unit land, investment levels, and trade volumes—remains largely conjectural given the fragmentary evidence base. Price data from North Africa during the Severan period are extremely limited, preventing detailed analysis of market integration and requiring reliance on comparative evidence from other periods and provinces (Kessler & Temin, 2007, pp. 143-150). The absence of comprehensive production statistics means that assessments of agricultural intensification and expansion depend on proxy indicators like settlement counts, installation numbers, and amphora frequencies that provide qualitative trends rather than precise measurements. Population estimates for North African provinces rest on contested multipliers applied to urban evidence, with rural populations particularly difficult to estimate given limited survey coverage and interpretive uncertainties about settlement sizes and occupancy patterns.

### **Conclusion**

The agricultural transformation of the Maghreb provinces under Severan administration constituted a watershed moment in the economic integration of Roman North Africa within imperial Mediterranean networks, though the developmental trajectories this transformation initiated proved complex and socially differentiated. This study has demonstrated that the intensification of agricultural production between 193 and 235 CE emerged from the confluence of imperial policy interventions—encompassing land tenure modifications, infrastructural investments, and fiscal mechanisms—with preexisting ecological potentials and indigenous agricultural knowledge systems. The expansion of imperial estate systems, codified through Hadrianic tenant legislation that remained operative throughout the Severan period, created institutional frameworks that simultaneously encouraged long-term investment in arboriculture while extracting substantial portions of production as rents and taxes. The distinctive configuration of Severan agricultural policy reflected both continuity with Antonine precedents and innovations tied to the dynasty's North African origins, particularly visible in frontier reorganization initiatives following Septimius Severus's campaigns of 203 CE and in infrastructure projects that facilitated market integration across provinces characterized by diverse bioclimatic zones. The material evidence—spanning epigraphic documentation of estate management conflicts, archaeological attestation of hydraulic infrastructure proliferation, and palynological reconstruction of forest exploitation patterns—reveals regional heterogeneity in implementation and outcomes that complicates narratives emphasizing uniform imperial imposition.

The implications of this research extend beyond narrow questions of agricultural administration to illuminate fundamental dynamics shaping economic development,

social stratification, and environmental transformation in provincial contexts. The Severan experience in North Africa demonstrates how state-sponsored intensification programs generated aggregate production increases while simultaneously displacing indigenous populations, concentrating land ownership among elite networks connected to imperial administration, and creating dependencies that channeled rural surplus toward urban consumption centers and Mediterranean export markets rather than enhancing local food security. The sophisticated market integration evident in price correlations across Mediterranean space coexisted with extractive fiscal mechanisms—particularly the expanded annona system—that distorted resource allocation and created structural vulnerabilities manifest in subsequent periods of political instability. Future scholarship would benefit from comparative analysis examining whether developmental patterns observed in Severan North Africa characterized other high-producing agricultural provinces during the Principate, and from deeper investigation of the environmental legacies of Roman agricultural expansion, particularly deforestation trajectories and soil degradation processes that shaped post-imperial landscapes. The methodological synthesis undertaken in this study, integrating epigraphic, archaeological, palynological, and legal evidence within interdisciplinary frameworks, offers productive models for reconstructing ancient rural economies where documentary sources remain fragmentary, while simultaneously underscoring persistent evidentiary limitations that necessitate cautious interpretation of quantitative claims regarding production volumes, productivity trends, and distributional outcomes.

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