

Poverty Dynamics in Algeria

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Abstract

This paper is concerned with poverty dynamics in Algeria. Using rigorous estimates of poverty line and available consumer surveys, new poverty indicators are provided. Oil windfalls in the context of Algeria's development strategy as well as generous social policies applied after independence, decreased poverty significantly from its pre-independence levels. In 1988 poverty head count was reduced to 15.0 %. However, the oil-based development strategy has resulted in an unsustainable growth path that led to the deterioration of poverty in the aftermath of the oil price collapse in 1986. In 1995, poverty has climbed to 22% and remained there until 1999. Even the social reforms and safety nets, applied as part an adjustment program, did not help reduce poverty any further. Given the significant improvement in the oil market since 1999 and under the assumption that this better economic outlook will continue over the medium term, our results show that poverty would decline rapidly to its 1988 level.

ديناميكية الفقر في الجزائر

بلقاسم العباس

ملخص

تهدم هذه الورقة بدراسة ديناميكية الفقر في الجزائر، فباستخدام تقديرات مضبوطة لخط الفقر وكذلك بيانات ميزانية المستهلك، ثم تقدير مؤشرات جديدة للفقر. من المعتقد أن اغلب السكان كانوا يعيشون قبل الاستقلال في حالة فقر شديد ولكن الدخول النفطية ووتيرة التنمية السريعة إضافة إلى السياسات الاجتماعية السخية سمحت بتخفيض مستويات الفقر بشكل ملحوظ، حيث وصلت هذه النسبة إلى 15% في سنة 1988. وقد نتج عن تطبيق إستراتيجية التنمية السريعة المبنية على النفط إلى عدم إستدامة النمو، ومن ثم أدى انهيار أسعار النفط سنة 1986 إلى ارتفاع نسبة الفقر مجددا لتصل إلى 22% في عام 1995 وبقاء معدلات الفقر عند مستوى 1995، حيث لم يؤدي إصلاح السياسات الاجتماعية و تطبيق شبكة الحماية الاجتماعية إلى تخفيض مستويات الفقر. ولكن التحسن في أسعار النفط منذ عام 1999 أدى إلى تحسن الوضع الاقتصادي. وفي حالة استمرار هذا الوضع في المدى المتوسط، نبين في هذه الورقة أن نسب الفقر ستراجع إلى مستوى عام 1988.

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Introduction

Following the collapse of growth around the mid-eighties, poverty in Algeria is becoming an acute problem. The actual heated debate in the newspapers on the extent of poverty reflects the public conscience *vis a vis* the problem of poverty⁽¹⁾ propagation. This was ignited by the oil price decline of 1986 in international markets, and political turmoil and instability further complicated the problem through the nineties. However, no serious attempts were made to quantify this phenomenon and address a detailed poverty profile for Algeria⁽²⁾. Given the widespread decline of the welfare of the population, there is an urgent need to map out poverty in order to better address this phenomenon and provide valuable information to policy makers. This paper attempts to build a detailed poverty profile for Algeria and study its dynamic between 1966 and 1995.

Poverty is deeply rooted in the Algerian society since the days of colonialism. The post independence development efforts helped improve the welfare of the population. The massive increase of oil windfalls and extensive foreign borrowing meant that an egalitarian socialist program of development and generous social policy was implemented quite easily, though not sustainable in the long run as demonstrated by recent experience.

The collapse of oil prices in 1986 and the ensuing budget and balance of payments problems forced successive governments to adopt increasingly flexible economic policies whose aim was to escape the rigidities and inefficiencies of central planning, and to promote sustainable growth. However, austerity measures paved their way as dwindling exports were coupled with ever increasing external debt. The limited results of reforms in the first half of the eighties prompted the government to accelerate these reforms. It started by introducing autonomy of SOE⁽³⁾s and encouraged the private sector back into agriculture. However, debt problems, low economic performance, and widening deficits led the government to negotiate in 1989 a first stand-by agreement with the IMF and the economic policy of overhauling central planning system was abandoned. Successive governments have subsequently accelerated the drive towards a market economy supported by structural adjustment programs and debt rescheduling.

The aim of this paper is to study poverty dynamics and its trend in Algeria between 1966 and 1995. Apart from the aggregate estimates of poverty levels made by the World Bank

⁽¹⁾ ¹ The Jeune Independent Newspaper in August 6, 2000 published an article titled “Algeria Poorer than Bangladesh.” However, Le Matin daily newspaper announced on March 12, 2001, that poverty in Algeria reached 33% and that 20 % suffer from malnutrition.

⁽²⁾ Kouider (1997) discussed the poverty question in Algeria, however no poverty estimates were given. Aggregate poverty measures are given in World Development Report (2000) for 1988 and 1995. These figures are reproduced in Table (22C). Other figures are summarised in CNES (1998) report on human development in Algeria.

⁽³⁾ This measure spelled out the end of formal central planning. Ministry of Planning was transformed to a planning agency.

and the UNDP using the Head count ratio and the international poverty line of \$1 US PPP in constant terms, there are no comprehensive published studies on poverty assessment for Algeria. This paper tries to fill this gap by contributing to the evaluation and analysis of poverty levels and dynamics using standard poverty profile assessment methods. This is achieved by computing the main poverty indices and using decomposition techniques to unveil the main factors contributing to poverty. Finally, the results are used to draw conclusions about poverty alleviation strategy for Algeria.

The paper begins with a brief section on the roots of poverty in Algeria to highlight the poverty burden inherited at the dawn of independence in 1962. Economic policies and reforms undertaken in Algeria are quickly reviewed in order to understand their implications on the welfare of the population. Social policies and poverty alleviation strategies applied in Algeria as a response to the growth collapse and decline of oil rents are also analysed in this section. Economic and social performance is briefly analysed. After a review of poverty measurement methods, the question of poverty is then addressed by measuring all the relevant indicators and a detailed poverty profile is then established. The paper presents new poverty levels and studies its dynamics between different sectors. Elements of poverty alleviation strategy are then presented, and the future of poverty is assessed.

Roots of Poverty

The French colonial policy in Algeria was a deliberate destruction of the country's national identity and indigenous social system, which was based on the society's basic needs. A massive wave of dispossession and confiscation of tribal land dislocated the farming and nomadic population. This colonial policy resulted in the virtual destruction of traditional institutions of Algeria⁽⁴⁾.

By the 50's, the French population in Algeria totalled nearly one million. The settlers owned most of the fertile land⁽⁵⁾. Gross inequality of income distribution was associated with dualism in production structures. The average productivity between these two sectors was 9 to 1. Settlers represented only 5 % of total population whereas their incomes was about 60% (El Ghoneimy 1999, Griffin, 1976 and Rudy, 1992). It is believed that between 65 per cent and 75 per cent of the Algerian population were living in destitute poverty.

Colonial rule restricted the indigenous people's access to principal human assets. In 1940-5, the primary education enrollment was only 9% for the Muslim population. The

⁽⁴⁾ On the accounts of under development formation in Algeria see Benachenhou, A. (1979)

⁽⁵⁾ Land distribution was on average 800 hectares per settler against only 8 -10 hectares for native landholders

estimated adult illiteracy was 86% (Rudey, 1992). This was the worst-off outcome among Arab children. This gloomy picture was complicated by high population growth. The population growth rate increased from 1.4 % before 1914 to 2.85 % in 1954. Of the indigenous population, two thirds still lived at the level of pre-capitalist substance economy (Ageron, 1991). A stagnant grain production and cattle stock coupled with high population growth threatened the livelihood of the population. This was the result of a decline in the area cultivated, the stagnation of the yield, the degradation of soil, land parcelling, and a lack of any mechanisation or credit. Crop yield was estimated at 4.5 quintals per hectare, while the threshold of malnutrition was estimated at 12 to 20 quintals per hectare. Given the situation of no growth in the traditional sector, rural unemployment was estimated in 1955 at half a million and increased to 0.85 million if underemployed were included. This situation prompted a massive wave of internal migration to big cities, as well as emigration to mainland France. The modern highly mechanised colonial agricultural sector, and the absence of vibrant industrial sector, could not provide job opportunities for migrant peasants. This migration wave created a huge shanty towns around inner cities. The independent state of Algeria had to address this poverty problem.

Economic and Social Policies and Performance

The Algerian economy is essentially an oil exporting; developing economy, in the process of transition to a market based economy. During the seventies, plans for economic development were based on the command economy style. Conventional macroeconomic policy was passive. Prices and interest rates were kept constant for long periods, basic goods were heavily subsidised, generating repressed inflation and excess demand in the consumer goods market. Public sector investment was allocated centrally by administrative schemes and met by the Treasury.

The monetary policy was very lax, and budget deficits were monetized due to the absence of developed financial market (bond market). This policy led to monetary overhang mixed with limited open inflation. Inflationary pressures were masked by buoyant hydrocarbon prices. Oil windfalls⁽⁶⁾ provided most financial resources (oil, fiscal revenues, and export proceeds⁽⁷⁾). Fiscal policy was also driven by the extent of oil revenues.

Rigid planning created enormous chronic shortages in the consumer goods market, inefficiency in the industrial sector, and a decline of the agricultural sector productivity.

⁽⁶⁾ See Conway (1988) for oil windfall uses in the context of Algeria

⁽⁷⁾ It is believed that oil revenues constitute two thirds of total government revenues, and hydrocarbon exports constitute almost the total of exports. Oil sector contribution to GDP is about a third, however its contribution to employment is only around 3%.

During the eighties, and after the second oil shock, coupled with the change in political leadership, attention shifted to reforming the central planning system and devising policies to deal with the growth collapse. However these reforms were designed to thin the central planning system and to introduce some flexibility, away from bureaucratic control and administrative regulation. No macroeconomic policy and structural reforms packages were considered

The collapse of the oil price in 1986 magnified economic distortions and plunged the economy into a deep long lasting recession. The Algerian authorities responded by adopting wide-ranging reforms aimed at transforming the Algerian economy to a market economy. After a period of initial timid reforms during the second half of the eighties, economic reforms sponsored by the IMF and the World Bank were implemented as early as 1989 by adopting the first stabilisation program, which consisted of currency devaluation, tighter fiscal and monetary policy. This enabled a reduction of the monetary overhang, which resulted from previous expansionist fiscal and lax monetary policies. Liquidity absorption allowed subsequent price liberalisation, and a gradual reduction of price subsidies.

The authorities' subsequent relaxation of fiscal and monetary policies during 1992 and 1993 prompted a deterioration of the economic situation and macroeconomic imbalances widened further. According to the IMF (1995) reform efforts until 1994 were either insufficient or could not be sustained. A third SBA program was approved on May 27, 1994, in order to enhance medium term economic liberalisation and accelerate the reform process. Economic policies introduced under the program emphasised tighter demand management and wage restraint, including further depreciation of the Algerian Dinar and reducing the budget deficit.

IMF support was further strengthened in 1995 by a three year EFF⁽⁸⁾ program. Structural measures under the program aimed at liberalising the economy and establishing market mechanisms. These measures included a managed float for the Dinar exchange rate, liberalisation of external trade, removal of price restrictions, and a phasing-out of generalised subsidies. The program also included some public sector restructuring and banking reform. The program aimed at ensuring high and sustained levels of economic growth to reduce unemployment, rapidly establishing a low level of inflation and restoring the balance of payments equilibrium by the end of the program. The reform package and policy actions during 1994-1998 were thoroughly reviewed in Nashashibi et al (1998) and IMF (2000). The

⁽⁸⁾ Algeria signed three Stand by Arrangements with the IMF in 1989, 1991 and 1994. It implemented a three years Extended Fund Facility between 1995 and 1998, and obtained a CCF in May 1999.

IMF praised Algeria for its steadfast implementation of structural reforms (Feller, 1996 and IMF, 2000).

Taking into account the policy reaction lag, it is very early to seriously to evaluate these IMF sponsored reforms. However, despite re-establishing macroeconomic balances, bringing inflation under control, and the noticeable improvement of external debt indicators, the unemployment rate is still high and shows no signs of reversing its trend. Population welfare as measured by real GDP per capita was severely curtailed, and poverty doubled between 1988 and 1995 and might be spreading at a faster pace thereafter. GDP growth rates improved significantly after 1994, however they were still driven by the outlook of the oil market and weather conditions for the agricultural sector. The growth of the manufacturing sector could not reverse its negative trend.

Despite structural problems and economic inefficiencies in the 1970s and early 1980s, the economic system was fairly successful in alleviating poverty. Thanks to oil rents, fiscal costs were not a major constraint. The wide coverage of the social system, despite large leakage to the better off, enabled the government to reach the poor. The universal food subsidy program covered 16 categories of food staples at affordable prices. However no targeting was applied, making the system impact large but with a huge cost. In 1988 the leakage to non-poor was estimated at 69 % of total subsidy. Transfers to bottom 40% were only 30% of total transfers⁽⁹⁾.

The increasing costs of universal food subsidies and the huge leakage to the non-poor led to reforms of the food subsidy program. By mid 1992 most of the food subsidies were eliminated⁽¹⁰⁾, therefore dropping the cost of subsidy ratio from 5% in 1991 to almost 2.3% of GDP in 1992. Prices of other subsidised goods such as energy and public basic services have been adjusted significantly since 1990⁽¹¹⁾.

The Algerian social protection system is comprised of both contributive and non-contributive components. The contributive component encompasses social insurance and provides cash benefits to its affiliates for contingencies such as retirement, disability, survivor's pensions, and health care⁽¹²⁾. The non-contributive component comprises the implicit and explicit consumer price subsidy, family benefits, and the social assistance programs. Despite the wide spread inefficiencies and large leakage to the non-poor, the system used to be fairly successful in alleviating poverty⁽¹³⁾. In the process of phasing out the

⁽⁹⁾ See World Bank Poverty Net in the Internet at <http://www.worldbank.org/poverty/> and Van Eghen (1998) and Gaicour (1998)

⁽¹⁰⁾ Except for semolina, flour for bread, milk.

⁽¹¹⁾ In 1994 prices of the remaining subsidised food products were increased by 41 % and prices of energy products by 50%.

⁽¹²⁾ See ISSA (2000) for a full description of the Algerian Social Security system

⁽¹³⁾ See World Bank (1995) and Van Eghen (1998)

food subsidy program, the government reformed the safety net in order to alleviate poverty, and to compensate vulnerable groups for food subsidy elimination and short term costs of adjustments. The social assistance programs were made of direct transfers in cash and in kind directed to the hard core poor unable to support themselves. It consists of financial aid to the handicapped and elderly poor as well as pension benefits to war veterans and their families, scholarships to less wealthy families. The social assistance programs also included food aid to children in schools located in disadvantaged areas. These social assistance programs consist of safety net schemes that were introduced in 1992. There were four cash benefits with an overall cost of 2.2 % of GDP in 1993 benefiting more than 60 % of the population. However, the scheme was poorly targeted due to lack of means testing. The system was further reformed in 1994 as part of the IMF supported Stand By Arrangements. Reforms were aimed at improving the system's targeting by transforming one of the benefits⁽¹⁴⁾ into cash transfers to poor households unable to work (elderly and disabled). A second transfer was established for the able-bodied and unemployed poor in the form of public works program⁽¹⁵⁾. In 1995, integrating three benefits into the social security system further reformed the system. Cash transfers to those unable to work replaced the untargeted cash allowance given to persons without income. The second scheme was a public work program. These two schemes covered about 15 % of the total population and cost about 0.8% of GDP in 1995. These reforms resulted in a financially efficient scheme, which better target the poor.

The public work program intended to provide short-term employment in various community based work areas to those able and willing to work at half the minimum legal wage rate. The poor quality of social administration and the lack of good records on beneficiaries led to poor targeting and widespread leakage to non-poor. The purging of the lists in 1996 permitted a reduction by half the number beneficiaries⁽¹⁶⁾. The economic reforms undoubtedly involved some public sector retrenchment and labour shedding (see Ruppert, 1999). In order to lessen the costs of revenue loss, an unemployment benefit was introduced in 1994 designed for laid off salaried workers in the economic sectors.

The shortcomings of the safety net programs in alleviating poverty prompted the government to further reform its social action program by creating a Social Development Fund (SDF) and a Social Development Agency in 1996. The fund undertook most of the tasks of providing emergency social protection, social investment, youth employment schemes,

⁽¹⁴⁾ Allocation Forfaitaire de Solidarite (AFS)

⁽¹⁵⁾ Programme d'Activite d'Interet General (PAIG)

⁽¹⁶⁾ In 1995, both schemes (AFS and PAIG) cost the government around 200 M US \$

social services, micro-credits and community development⁽¹⁷⁾. Through an independent social development agency, the fund also undertook the task of managing the country's safety net, from the ministry of social affairs. The agency became the government arm for formulating and executing its social policy and poverty alleviation strategy.

As was explained above, economic policy in Algeria went through different episodes which could be summarised as accelerated development central planning, loosening and overhauling of the central planning system, and then a transition to market economy and liberalisation. Oil windfalls, external shocks and the availability of external finance played major roles in shaping this policy. The oil sector has a heavy direct effect on the economy, over two thirds of government revenues originate from this sector, as exports consist nearly entirely of hydrocarbon. This sector also accounts for a third of GDP. However, its contribution to total employment is minimal (around 3%). Sharp fluctuations in the price of oil are directly translated to the balance of payments, output, and the budget⁽¹⁸⁾. Table 1 summarises the performance of the Algerian economy between 1962 and 1998. The performance indicators were calculated in specific periods. These are thought to reflect major shifts in economic policies and changes in political orientations since Algeria's independence.

During the period between 1967-1979, government efforts were mainly devoted to building an industrial sector based on import substitution of heavy basic industries in order to promote growth and employment. The accumulation rate of physical assets increased rapidly from 15% in 1967 to 49 % in 1979 as shown in graph 1.3. The accelerated pace of industrialisation in basic industries was financed by foreign loans and oil windfalls and external debt. This strategy proved fatal as the debt service started to increase when the oil prices collapsed in mid 1980. Principal repayments reached 6.9B US\$ and the debt service ratio rocketed to 80 % in 1988 as shown in Graph 1.10.

The development strategy of the seventies assumed that industrialisation would increase substantially GDP growth and structurally transform the economy so as to permit sustainable external finance and improve economic and social welfare. In fact real GDP growth of 6 % pa was based mainly on horizontal expansion and accumulation of capacity (Graph 1.9).

⁽¹⁷⁾ Other funds were also created such as the fund for supporting youth employment and the fund for developing vocational training. These Schemes are describes in CNES (1998).

⁽¹⁸⁾ It is estimated that a fluctuation of 1\$ pa results in a change of export proceeds by \$600m and a change of AD 35B in government revenues (see Arezki (2000)).

Table1. Selected Economic Performance Indicators, 1962-1998

	1962-1964	1965-1978	1979-1991	1979-1985	1992-1998
Agriculture, value added (annual % growth)	-7.0509	6.142338	5.626844	6.034565	2.97243888
GNP growth (annual %)	0.35373	6.695304	2.400644	4.826225	2.001784444
GNP per capita growth (annual %)	-1.6726	3.599598	-0.54197	1.58171	-0.229482089
GNP per capita, Atlas method (current US\$)	233.333	606.4286	2374.615	2221.429	1661.428571
GNP per capita, PPP (current international \$)		2080.848	3812.228	3344.789	4474.48856
Gross domestic fixed investment (annual % growth)		17.25648	-2.75531	1.016265	1.428665689
Industry, value added (annual % growth)	39.9442	7.524027	2.041207	3.860217	-0.500883542
Private consumption (annual % growth)	22.165	6.64633	2.954263	6.876048	-2.854583766
Private consumption per capita growth (annual %)	19.7035	3.546456	-0.0071	3.569519	-4.986360833
Unemployment, total (% of total labor force)			19.26667	0	25.67499971
Genuine domestic savings (% of GDP)		9.277507	3.557323	-1.19731	6.574808938
Current account balance (% of GDP)		-12.2262	-0.31928	-0.40048	
Exports of goods and services (annual % growth)	0.83769	4.248667	2.757074	2.741137	2.369703855
Exports of goods and services (constant 1995 US\$)*	12.4	91.7	119	57.5	80.8
Exports of goods and services (current US\$)*	1.79	39.2	159	95.1	84.3
External debt, total (current US\$)**		15.7	28.2	18.3	30.7
Food exports (% of merchandise exports)	31.8619	13.59876	0.395111	0.733778	
Food imports (% of merchandise imports)			24.16667	21.33333	
General government consumption (% of GDP)	16.6598	14.46093	15.74909	14.50359	16.90730327
Gross domestic fixed investment (% of GDP)		36.92454	31.23053	34.25201	26.83316149
Industry, value added (% of GDP)		43.49155	48.76857	52.38637	47.66359111
Inflation, consumer prices (annual %)		7.881072	11.08889	9.517255	23.15564545
Inflation, food prices (annual %)			9.637698	5.12173	21.94540058
Total debt service (% of exports of goods and services)**		20.56156	46.76264	31.57293	46.84702165
Total debt service (% of GNP)**		4.09973	11.22103	9.793691	13.21424961
Total debt service (TDS, current US\$)*		5.391	72.97	30.86	41.41
Official exchange rate (LCU per US\$, period average)	4.93706	4.527475	6.300343	4.485527	42.72828048
State-owned enterprises, employment (% of total)		8	7.65	7.985714	
State-owned enterprises, investment (% of GDI)		70.36996	48.18469	48.18469	
State-owned enterprises, net financial flows from government (% of GDP)		24	15.54286	15.54286	

Source: Compiled by the Author from WDI(2000)

* Cumulated sums

** End of period

The rapid pace of public investment, although inefficient, permitted per capita GDP to increase seven fold, from 260 US\$ in 1969 to around 1,940 US\$ in 1979. Despite the high growth rate of labour force of more than 4% pa unemployment rate decreased from 23.9% in 1967 to 15.79% in 1979 (Graph 1.4). During this period the exchange rate was kept constant at 4.6 AD to one US\$, as shown in Graph 1.7 and open inflation rate accelerated from less than 5% in 1967 to reach more than 15% in 1978 (Graph 1.1), despite stringent price controls.

The substantial increase in the price of oil in 1979 permitted financing of a consumer boom that proved difficult to maintain after the oil price collapse in 1986. Real GDP grew at 4.7 % pa and fuelled primarily by new infrastructure projects, especially in housing and highways. Inflation stood at 9.2 % pa despite its decline from a peak of 17 % in 1979. This was due to the easing of excess demand in the consumer market and overvaluing the exchange rate which was well below its real counterpart (see Graph 1.7). Real Effective Exchange Rate (REER) depreciated from 1980 until 1985. After 1985, it appreciated under the pressure of domestic inflation at a rate higher than world inflation (see Graph 1.5). This expansion program kept the unemployment rate at its 1979 level (15%) and even went below this level in 1985. The accumulation rate declined from its peak of 1978 to reach just above 30 % in 1989, which permitted the current account to improve substantially and reach 2% of GDP in 1985 (Graph 1.2).

The increase in oil revenues and the investment program permitted the steady increase of GDP per capita from 1,939 US\$ in 1979 to 2,876 US\$ in 1985. However, the decline of oil prices in 1986 ignited a process of economic and social decline. Nominal GDP per capita steadily declined to reach a level of 1958 US\$ in 1998, which was, in fact, below the level achieved in 1980. Average real GDP growth between 1986 and 1998 was only 1.8 % pa, far below the previous record.

Policy makers thought that this downturn in oil prices was only a temporary phenomenon. They resorted to further external borrowing to finance the balance of payments deficits. Short-term external debt reached 3.1B US\$ in 1986 and total debt stock increased from 18B US\$ in 1985 to 33.4 B US\$ in 1996. This rapid growth in debt coupled with a lack of GDP growth increased debt indicators substantially. Debt to GDP ratio increased from 47 % in 1980 to 64 % in 1990 and debt service from 27.4 % to 70.4 % for the same period. The current account deteriorated to reach -4.0% of GDP in 1989. This unsustainable situation in the external sector led to debt rescheduling⁽¹⁹⁾ with commercial banks for an amount of 1.5B

⁽¹⁹⁾ Algeria failed to make a repayments of 800 M\$ in 1991. This led to an innovative commercial refinancing deal, called reprofiling worth 3.2 B \$. But debt ratio remained high and another reprofiling deal was achieved with Japanese Banks in 1993 worth \$9.0 B. However, these reprofiling accords did not solve the severe debt problems and forced the government to sign a deal with IMF in April 1994 followed by a debt rescheduling in May 94 worth 5.3B and a second deal in July 1995 worth 7B.

US\$ in March 1992 and 3.2B US\$ in June 1995. Official creditors agreed on a debt relief program in June 1994 and July 1995, which permitted to consolidation of 5.2 and 7.0B US\$ respectively. These agreements eased the external debt constraints and reduced the debt service ratio from 76 % in 1993 to just 27.2% in 1997.

The hesitance and delays in applying reforms and adjustment programs between 1986 and 1994, mainly for political reasons, and to temporary improvements in the balance of payments after the Gulf War in 1990, helped to complicate the economic environment further. Inflation galloped rapidly from 10% in 1985 to reach more than 30% in 1992. The stringent measures of curbing demand included in the IMF programs helped to restore inflation back to 2.6% in 1999. These measures included a massive devaluation of the Algerian dinar from 4.6 per 1US\$ to reach 73 AD to 1US\$ in 1999, with a devaluation rate of 21.5 % pa between 1992 and 1999. This series of devaluations helped to depreciate the real exchange rate substantially from 1992, which reduced expenditure and switched it away from the tradable sector. A deliberate policy of building foreign exchange reserves was engaged to reach the amount of 7B US\$ in 1998, in order to face short-term volatility of export earnings.

The reform programs applied since 1989 helped to stabilise the Algerian economy and provided the necessary environment for growth promotion. However many structural constraints still impede growth take-off. These are primarily related to low efficiency in the public industrial sector and to total dependency of the hydrocarbon sector in financing balance of payments and the budget. The adopted stabilisation and adjustment measures did not help spur high growth rates. In fact the unemployment rate soared to 28 % in 1998. This was basically due to high labour market entry and a continuous decline of public sector employment. The decline of real wages and the deterioration of the labour market led to a real decline of per capita consumption from 1,000 US\$ in 1987, to just 559 US\$ in 1998 in 1995 prices. According to these figures, income poverty should on the increase. Despite the positive real GDP growth since 1994, mainly driven by the outlook of the hydrocarbon sector and weather conditions, it is still very fragile and below levels that permit it to catch up GDP losses during the nineties.

Despite fast population growth, social indicators in Algeria are generally good. Table 2 summarises some of the important social indicators. As far as education is concerned, net primary enrollment ratio increased from 86 % for the period 1980-85 to reach 94% for the period 1990-95, well above the MENA average of 81%. (WDI, 2000). Gender differences amounted to 10%, reflecting lower female enrollment in rural areas. These rates decline rapidly for secondary and higher education. However, the gender gap is narrowing.

Table 2. Social Indicators for Algeria

Population (1999), millions	30.0
Population Growth Rate (1999)	1.8
Labor Force Growth Rate (1999)	3.7
Unemployment Rate (1998)	28.0
Urban Population (% of total)	60.0
Life Expectancy at Birth (93-99)	71.0
Access to improved water source (% of population, 93-99)	70.0
Gini Indicator (1995)	35.3
Under five mortality rate	40.0
Adult illiteracy rate (1998)	33.0
Male	24.0
Female	46.0
Public expenditure of health (% of GDP, 90-95)	3.3
Public expenditure on education(% of GDP, 97)	5.1
Net enrollement rate (1997), Primary	96.0
Net enrollement rate (1997), Secondary	69.0
Years of schooling (1997)	
Male	12.0
Female	10.0
Proportion of Women Delivering under Professional Supervision (98)	77.0
Maternal Mortality Rate (94)	140.0
HIV prevalence (1997)	0.1
DPT3 Coverage of Children between 12-23 Months (% , 1997)	79.0
Infant Mortality Rate (1997)	32.0
Underweight prevalence (1995)	12.8
Contraceptive Prevalence (1995)	52.0
Primary and Secondary Education net enrollement (1997)	
Male	71.0
Female	64.0
People without access to safe Water (1998)	10.0
People without access to Sanitation (1998)	9.0

Sources: WDR(2000), WDI(2000) UNDP(2000)

Improvements in education indicators are not reflected at the general illiteracy level. In fact about 35 % of the population are illiterate (24 % for male and 46 % for female). This reflects the fact that older generations did not have access to education. Nonetheless, this illiteracy ratio compares favourably with MENA average (56 % in Morocco, 49 % in Egypt).

Life expectancy at birth increased from 52 years in 1967 to 70 years in 1995. This ratio compares favourably with high levels reached in the Gulf States, and well above levels of poor Arab countries. The increase in longevity coincided with a decline in female fertility rate from 7.4 in 1970-75 to just 3.5 in 1990-95. This reflects a process of demographic transition that will increase the old age dependency ratio in the future. Longevity increased due to the improvements in health and safety indicators, as well as to universal free access to

health services and education. The ratio of health expenditure to GDP equals 3.3 % and is one of the highest in Arab Countries (WDI, 2000).

Access to safe water ratio increased from 84 % in 1970-75 to 100.0 % in 1990-95 for the urban areas, and was 77 % for rural area. Access to sanitation is less than safe water (66 % in 1998). The infant mortality ratio is still high at 32 (MENA average 54), however it has declined rapidly from 132 in the seventies, to just 9% in 1990-95. This is thanks to the immunisation campaign (where the rate increased from 17% to 69%) for measles and to the reduction of child malnutrition

Housing conditions and unemployment represent the major deficiencies of the social welfare in Algeria. The 1998 population census results show that precarious housing represents 6.95% of total housing as opposed to 10.3% in 1966. However data are thought to be unreliable as it excludes slum areas. Fast population growth and sluggish house delivery led to some housing overcrowding. The average house occupancy rate was 7.4 individuals in 1995 (7.6 in rural and 7.1 urban areas) while the number of households per house increased from 1.06 in 1987 to 1.14 in 1995. Moreover, the number of persons per room was 2.7 in urban and rural area. The proportion of households of more than seven persons per house constituted 40 % of total households. In fact 90 % of houses are overcrowded with 1.2 households per house. Severe overcrowding (more than 3.4) represented more than 28 % in 1995.

Data and Poverty Assessment Methods

Income poverty exists if one or more members of the society are unable to reach a predefined minimum level of welfare or standard of living. (Lipton and Ravallion, 1993, Ravallion, 1992) either in an absolute or relative sense. Material welfare is usually determined by the command over commodities and services as well the acquisition of publicly provided goods. Standard of living can be either measured by income, consumption level of households or individuals⁽²⁰⁾.

Most poverty assessment studies relied on consumer expenditure surveys for the estimation of income based poverty indicators. These indicators permit the measurement of poverty in a given society, build a poverty profile and simulate the effects of growth and distribution, and analyses the contribution of sub-sectors to the overall poverty. Devised measures usually highlight poverty in three dimensions: poverty level which is measured by

⁽²⁰⁾ The choice of the appropriate welfare indicator (income, consumption per adult equivalent, caloric content) is very important in poverty assessment as it has direct implication on the poverty estimates (see Anand and Harris (1994)).

the head count ratio; poverty depth which is measured by the deviation of the welfare of the poor from the minimum level of welfare, as measured by the poverty gap; poverty severity which is measured by inequality distribution among the poor. When measuring poverty one needs to properly define welfare or living standard indicator. Welfare distribution among the members of the population must also be defined. The poverty line, which reflects minimum welfare, must be known. There must also be a poverty indicator, which determines poverty aggregation. And finally, there must be a unit of measurement.

Suppose that the welfare level of individual i is denoted Y_i and $f(y_i)$ represents the welfare distribution among the member of the population. Suppose also that $f(\cdot)$ is continuous and Z measures the poverty line. The poverty index can be written as:

$$\psi(Y_i, Z)$$

ψ is non-decreasing function in Z and homogeneous of degree zero⁽²¹⁾ in its arguments.

Suppose also the family of additive poverty measures:

$$P(Z) = \int_0^Z \psi(Y_i, Z) f(Y_i) dY$$

From the available poverty measures in the literature⁽²²⁾ we choose Foster Thorbeck Greer (1984) poverty measures which have the desirable features of respecting the principal poverty axioms.

$$\psi(Y_i, Z) = (Z - Y_i / Z)^\alpha$$

α Takes different value and represent inequality aversion among the poor. When $\alpha = 0$ we obtain the head count ratio which measures the proportion of people living under the poverty line.

$$P_0 = P(Z) = \int_0^Z f(Y) dY = \frac{H}{N}$$

Where H is the number of the poor having welfare level under the poverty line and N the total number of the population.

When $\alpha = 1$ we get:

$$\psi(Y, Z) = (1 - \frac{Y_i}{Z})$$

Which gives the poverty gap measure

⁽²¹⁾ Homogeneity of degree zero ensures that proportional changes in poverty line and expenditure does not change the poverty index. This assumes that the poor have no money illusion.

⁽²²⁾ See Zheng (1997) for a good survey of poverty measures and the basic axioms.

$$P_1 = \int_0^z (1 - \frac{Y_i}{Z}) f(Y) dY$$

$$P_1 = H(1 - \frac{\mu_z}{Z})$$

Where μ_z represents average welfare of the poor and given by:

$$\mu_z = \frac{1}{H} \int_0^z Y f(Y) dY$$

Poverty gap does not measure the inequality between the poor, but does have an attractive interpretation as far as poverty alleviation is concerned. In fact, the amount ZP_1 represent the minimal amount of resources needed to transfer from non-poor to the poor in order to lift the latter out of poverty. This is obtained by subtracting the poor's income after the transfer $Z.H$ from their income before the transfer $H.\mu_z$:

$$HZ - H\mu_z = H(Z - \mu_z) = ZP_1$$

When $\alpha = 2$ we get an additive measure of poverty severity which measures the degree of welfare inequality distribution between the poor.

$$P_2 = \frac{H}{N} \sum_{i=1}^H (1 - Y_i / Z)^2$$

This measure reflects that poverty severity is only a weighted squared sum of poverty gaps as a proportion of the poverty line.

To construct a detailed poverty profile, it is important to explain poverty dynamics between different periods and measure the contribution of changes in growth and changes in welfare distribution. Using the Kakwani (1990) approach, welfare distribution is represented by parametric Lorenz Curve:

$$L(\mu, \theta)$$

Where μ and θ are respectively average welfare and Lorenz curve parameters. The vector of parameters, θ , is estimated from welfare distribution data using either beta Lorenz curve of Kakwani (1990) or a quadratic function of Villsenor and Arnold (1984). Using this function, we obtain a parametric poverty measure:

$$P(\mu / Z, \theta)$$

This formulation permits simulation of numerous hypotheses (Datt, 1992), such as poverty measure sensitivity to changes in the poverty line, Z , and the simulation of the effects of a welfare distribution neutral growth, and in mean welfare μ . This presentation permits

decomposition changes in poverty measures to growth and distribution effects between two periods t_0 and t_1 using the following formulae proposed by Ravallion and Datt (1992):

$$P(\mu_1/z, \theta_1) - P(\mu_0/z, \theta_0) = \\ [(P(\mu_1/z, \theta_0) - P(\mu_0/z, \theta_0))] \\ + [P(\mu_0/z, \theta_1) - P(\mu_0/z, \theta_0)] + \xi$$

The first element in the right hand side measures the change in poverty index between the two periods holding welfare distribution constant. The second measures the changes in the poverty index holding the growth in welfare constant. ξ Measures a residual that cannot be explained by growth and distribution. Poverty indices could also be measured for m sub-sectors of the population with N_i population in each sub-sector i . Total population is given by:

$$N = \sum_i^m N_i$$

The aggregate poverty measure could be expressed as a population weighted average of sectoral poverty index:

$$P_\alpha = \sum_{i=1}^m \frac{N_i}{N} P_{\alpha i}$$

If we assume that the society is divided into two sub-sectors, rural (r) and urban (u), then we can decompose poverty index between two periods t_1 and t_2 as follows:

$$P_\alpha^2 - P_\alpha^1 = (P_{\alpha u}^2 - P_{\alpha u}^1)N_u^1 + (P_{\alpha r}^2 - P_{\alpha r}^1)N_r^1 + \sum_{i=u}^r (N_i^2 - N_i^1)P_i + \sum_{i=u}^r (P_{\alpha i}^2 - P_{\alpha i}^1)(N_i^2 - N_i^1)$$

This formula, proposed by Ravallion and Huppi (1991), decomposes poverty index between two periods into intra-sectoral effects, a population shift, and interaction effects.

A major issue in poverty measurement is that of evaluating poverty elasticity with respect to the welfare indicators. According to Kanbur (1987) and Kakwani (1990, 1993) the elasticity point of the poverty index with respect to the distribution of neutral growth is only the elasticity of cumulated distribution evaluated at the poverty line:

$$\eta_\alpha = \frac{-Zf(Z)}{P_0} \text{ if } \alpha = 0 \\ = \alpha \left(1 - \frac{P}{P_\alpha}\right) \text{ for } \alpha \geq 0$$

And following Ravallion and Huppi (1989) one can evaluate the degree of poverty acceleration due to welfare changes. By differentiation of the above equation, we obtain:

$$\begin{aligned}\frac{\partial \eta_{\alpha}}{\partial \mu} &= -\eta_0^2 / \mu \quad \text{for } \alpha = 0 \\ &= (\eta_{\alpha} - \eta_{\alpha-1}) / \mu P_{\alpha-1} \quad \text{for } \alpha > 0\end{aligned}$$

The increase in welfare might be accompanied by a worsening of income inequality. Total poverty will increase or decrease depending on which factor is dominant. The elasticity of poverty index with respect to a change in distribution can be evaluated by the Kakwani (1993) formula:

$$\varepsilon_{\alpha} = \eta_{\alpha}^P + \frac{\alpha \mu^P P_{\alpha-1}}{Z P_{\alpha-1}}$$

Since mean income and inequalities can each affect poverty, we can evaluate the trade-off between mean welfare and its distribution given by the Marginal Proportional Rate of Substitution (MPRS):

$$MPRS = \frac{\partial \eta}{\partial G} \frac{G}{\mu} = -\frac{\varepsilon_{\alpha}}{\eta_{\alpha}}$$

This equation evaluates how much growth in welfare is needed in order to off-set the negative impact of 1% increase in inequality of welfare distribution. We can also estimate the sensitivity of the poverty index to changes in the welfare distribution as measured by Lorenz curve and summarised by Gini Index (G):

$$\begin{aligned}\frac{\partial \eta_{\alpha}}{\partial G} &= \frac{\eta_0}{G} \quad \text{for } \alpha > 0 \\ &= \frac{(\varepsilon_{\alpha} - \varepsilon_{\alpha-1}) \alpha^P P_{\alpha-1}}{G P \alpha} \quad \text{for } \alpha \geq 0\end{aligned}$$

Where ε_{α} is the elasticity of P_{α} with respect to G. it is also important to test for significant differences in poverty levels between sub-sectors and/or periods.

The estimation of the poverty line Z represents the backbone of any poverty assessment study. The major source of uncertainty in any poverty profile stems from the setting of this poverty line. No wonder that numerous efforts were devoted to this problem. This resulted in different methods in setting this line. The poverty line represents a benchmark value for classifying people into poor and non-poor. It also measures the minimum required welfare for leading a healthy decent life and fully participate in the society.

In order to fix a poverty line, researchers followed many approaches. The most widely used approach for setting poverty lines for poverty stricken developing countries is the objective or absolute poverty notion. According to Sen (1987) poverty should be determined by the non-achievement of certain capabilities. In the framework of income poverty, attention

was given to the determination of the revenue or the expenditure on commodities needed to satisfy these capabilities. However, in the human poverty approach the stress is on identifying human capabilities to lead a healthy normal life. This approach was developed by Sen (1976, 1985, 1987) and related the concept of poverty estimated by the UNDP using a composite index. Ravallion (1978) used traditional demand dualism concepts in order to reconcile the capabilities approach with income poverty by providing a mapping between the capabilities space and the commodities space.

Sen's approach is an extension of the basic needs approach developed by Rowntree (1899) in his seminal paper about poverty in York, England. In this approach poverty is defined by the satisfaction of a certain basic needs deemed necessary. It is essential to regard that food is the most important item of these basic needs. Non food basic needs should cover adequate provision of, among other things, basic health care, education, proper clothing, and decent shelter.

It is very difficult to agree on a single list of basic needs, as this is dependent on many factors. To reduce this arbitrariness in setting the poverty line many methods were devised to compute it. Central to these methods is the computation of food basic needs using Food Energy Intake (FEI). In this method daily individual requirements of food energy in calories are determined by a nutritionist (WHO, 1985) with respect to what the human body needs to perform its vital metabolic operations and also permits to the individual to do necessary activities and contribute to society. Needless to say that requirements differ according to many factors such as sex, age, climate, regions, nature of activities. Once Food Energy Requirements (FER) are determined the cost of obtaining these calories is determined in terms of expenditure on food. Unfortunately there are countless numbers of diet combinations that have the same caloric values. One obvious choice is pick the least cost diet taking into account local tastes and cultural factors that determine consumption habits. The pattern of expenditure of the lowest decile or quintile will better reflect the consumption habits of the poor, and help to construct a poverty line.

Determining the non-food component $\left(Z_{nf} \right)$ of the poverty line is even more complicated, as there is no obvious anchor such as FER to establish the value of Z_{nf} . According to the basic needs method one has to construct what constitutes basic non-food and estimate its cost. Other non direct methods were used either to calculate this component, or estimate the total poverty line Z . The food expenditure method of Orashansky (1963, 1965) applied in the USA establishes the food poverty line Z_f using the FEI and then dividing the

food poverty line by the share of food expenditure in total expenditure. This method produces a poverty line assuming that the non-food poverty line is determined by average spending on food. This method is clearly biased, as poor expenditure on non-food does not necessarily coincide with aggregate average. One way to improve on this method is to use the share of the lowest expenditure quintile.

A more rational method developed by Thorbeck and Greer (1986) that takes into account the structure of spending and its relation to FER. Then fits it to a caloric Engle curves so that the data of food expenditure is evaluated at its caloric value. Using the OLS method of applying the total food expenditure to sample data, one can determine the poverty line at a predetermined FER. This method yield a poverty line anchored in the demand structure and does not require price data as quantities are easily converted to their caloric content values.

Both methods avoid the estimation of the non-food component of the poverty line. One known easy method of evaluating Z_{nf} is to determine Z_f using FER and then to look at the welfare distribution to spot the individual expenditure that equals food poverty line. The non-food expenditure associated with this food expenditure will be regarded as non-food poverty line. Ravallion (1994) disputed the idea of people spending on non-food items after allocating the food budget. He argued that people spend first for survival food, then for basic non-food and last, allocate the rest to basic food. This suggestion assumes that people displace some of their food expenditure to non-food expenditure. To determine the poverty line one has to set the food poverty line and then spot the total expenditure equal to Z_f . This will determine the total expenditure before displacement. The non-food expenditure of this group will be equal to Z_{nf} after displacement.

Ravallion (1994) also suggested the determination of a dual poverty line instead of using a single point estimate. This will help to reduce the degree of uncertainty inherent in the estimation of the poverty line. A lower poverty line would be set at the level of expenditure of a household which is just capable of reaching food requirements. This lower poverty line (Z_L) is defined as the food poverty line (Z_f) plus the non-food spending of households who can just afford Z_f . The upper poverty line (Z_U) is the total spending level at which a household actually spends Z_f on food. Using a linear Engle curve both poverty lines can be estimated from readily available data on food expenditure Y_f , total expenditure Y , and the food poverty line Z_f :

$$\frac{Y_f}{Y} = \alpha + \beta \log\left(\frac{Y}{Z_f}\right) + \varepsilon$$

Where α is the average food share of those households that can just afford basic food needs, the upper poverty line Z_U is calculated as follows:

$$Z_U = \frac{Z_f}{\alpha^*}$$

and the lower poverty line Z_L is given by the following formula:

$$Z_L = (2 - \alpha)Z_f$$

The parameter α^* can only be solved numerically from the following formula:

$$\alpha^* = \alpha + \beta \log\left(\frac{1}{\alpha^*}\right)$$

The above equation was estimated based on expenditure distribution and poverty line using data for 1988. The upper and lower poverty lines for the other years were updated using calculated inflation rates.

The assessment of absolute poverty lines based on methods described above requires the determination of population energy needs. Traditionally a single figure for the average energy needs of a population is derived, and then used to compile the cost of these energy needs. This approach needs to be modified so that a proper allowance is made for the fact that body weight and Physical Activity Level (PAL) are the two prime determinants of energy requirements. Based on the WHO (1985) guidelines, James and Schofield (1990) devised a method for calculating population energy needs. The results of this method applied to Algeria are given in Table (3). The method consists of splitting the population by gender and age, and then Basal Metabolic Rates (BMR) are calculated for each group (by age and sex) using formulae based on population weight. The estimation of the average total daily energy requirement (T) of an age group is calculated as the product of BMR and PAL. The application of this method for Algeria gives an average of per capita requirements of 2100 Kcal per day.

The next step in the construction of a poverty line is to estimate the food poverty line that corresponds to the satisfaction of the 2100 Kcal a day. This step is very difficult to apply, as there are countless combinations of diets that give the same caloric content of 2100 Kcal a day. To minimise arbitrariness in setting the food poverty line we based our calculation on food expenditure at the goods level of a poor household (lowest quintile) using the 1988-expenditure survey. We also used the table given by Autret (1978) that lists the necessary

Table 3. Required Food Energy Intake for Algeria

Male	Poulatipon	Average body wieght	BMR	PAL	Energy Allowance	Average Individual Need	Total Age Group Need
0.0	426.0	7.3	778.8		109.0	795.7	338968.2
1.0	407.0	10.9	841.8		108.0	1177.2	479120.4
2.0	390.0	11.7	855.8		104.0	1216.8	474552.0
3.0	374.0	14.2	899.5		99.0	1405.8	525769.2
4.0	360.0	16.0	931.0		95.0	1520.0	547200.0
5.0	348.0	17.8	962.5		92.0	1637.6	569884.8
6.0	337.0	19.7	995.8		88.0	1733.6	584223.2
7.0	327.0	23.3	1058.8		83.0	1933.9	632385.3
8.0	318.0	24.9	1086.8		77.0	1917.3	609701.4
9.0	309.0	27.5	1132.3		72.0	1980.0	611820.0
10.0	301.0	30.6	1186.5	1.8		2088.2	628560.2
11.0	294.0	34.3	1251.3	1.7		2152.2	632732.1
12.0	287.0	36.5	1289.8	1.7		2179.7	625567.4
13.0	279.0	41.4	1375.5	1.7		2297.1	640886.7
14.0	271.0	43.3	1408.8	1.7		2324.4	629922.6
15.0	263.0	48.5	1499.8	1.6		2429.6	638983.5
16.0	256.0	49.9	1524.3	1.6		2438.8	624332.8
17.0	248.0	56.3	1636.3	1.6		2618.0	649264.0
18-29	2293.0	64.6	1667.4	1.8		3034.6	6958410.6
30-59	2211.0	64.6	1628.4	1.8		2963.6	6552553.2
>60	527.0	64.6	1359.1	1.5		2052.2	1081531.0
Total	10826.0	33.7	1208.1	1.7	92.7	1995.1	1192208.0
Female							
0.0	399.0	6.8	829.0		109.0	741.2	295738.8
1.0	385.0	9.8	865.6		113.0	1107.4	426349.0
2.0	372.0	11.9	891.2		102.0	1213.8	451533.6
3.0	359.0	14.2	919.2		95.0	1349.0	484291.0
4.0	348.0	15.9	940.0		92.0	1462.8	509054.4
5.0	337.0	18.0	965.6		88.0	1584.0	533808.0
6.0	327.0	19.3	981.5		83.0	1601.9	523821.3
7.0	318.0	21.6	1009.5		76.0	1641.6	522028.8
8.0	309.0	24.5	1044.9		69.0	1690.5	522364.5
9.0	300.0	26.4	1068.1		62.0	1636.8	491040.0
10.0	292.0	29.8	1109.6	1.7		1830.8	534586.0
11.0	284.0	33.6	1155.9	1.6		1872.6	531815.7
12.0	276.0	37.6	1204.7	1.6		1927.6	532004.4
13.0	269.0	41.6	1253.5	1.6		1980.6	532771.1
14.0	261.0	45.3	1298.7	1.6		2038.9	532151.9
15.0	254.0	48.1	1332.8	1.5		2052.5	521345.9
16.0	247.0	49.8	1353.6	1.5		2057.4	508180.6
17.0	239.0	50.4	1360.9	1.5		2068.5	494380.5
18-29	2207.0	52.0	1260.4	1.7		2104.9	4645443.8
30-59	2476.0	52.0	1281.4	1.7		2139.9	5298486.9
>60	324.0	52.0	1142.0	1.6		1781.5	577212.5
Poulation	10583	31.4574	1107.96	1.59099	88.9	1708.77	927067.05
Total	21718						45696984
					2100		

Source: James and Schofield (1990)

food expenditure for Algeria that was developed as part of a FAO study on nutritional requirements in Algeria. Table (4) below gives the content of the food poverty line by quantity and energy content of the goods regarded as minimal daily requirements of per capita food consumption.

Using 1995 commodity prices given in ONS (1998), the food poverty line was estimated at 12,017 Algerian Dinars (AD) in current prices per annum. The corresponding real food poverty line was 4,088 AD in 1989 prices. Data given in Table 4 also permitted an update of the food poverty line for 1967, 1980, 1988 using food prices data over the period 1967-1995 published by ONS (1998). The food poverty line (FPL) for these years is given in Table 5. The results show that between 1967 and 1988 the FPL increased from 519 AD to 2,766 AD reflecting an average per annum inflation rate of 9%. The collapse of oil prices and the adjustment process that followed pushed the FPL to 12,017 AD reflecting an average inflation rate of 21% pa. As we do not have a detailed expenditure pattern similar to that in 1988, we assumed that the expenditure structure was fairly constant. This is a fair assumption, as the data on the expenditure pattern over 1967 to 1988 does not show a dramatic shift.

The computation of the non-food component of the poverty line is even more problematic. The methods of computation consist of either scaling-up the food poverty line or assuming ad-hoc non-food basic necessary expenditure. Orshansky's method, consisting of dividing FPL by the average food share of average expenditure, or by the food share of people belonging to the lowest decile, is a straightforward method of evaluating the PL. According to this method, the PL evolved from 798 AD in 1967 to 4,255 AD in 1988, and to 18,488 AD in 1995⁽²³⁾. These figures are consistently higher than those given by the World Bank for 1988⁽²⁴⁾ and 1995. This is due to the fact that the share of food in total expenditure is low even for people at the bottom decile. For example, the expenditure data for 1988 show that food share of the lowest decile was 65%, whereas that of the average expenditure was 52.5%. These proportions imply high total poverty lines, and of course a higher poverty level as estimated on the basis of these PLs.

The application of the Ravallion (1994) method, which is based on the methodology, explained above, permitted the evaluation of a total poverty line based on people having expenditure equal to their food expenditure. By looking at the total and food expenditure, we evaluated non-food expenditure and added it to food PL. Ravallion's estimates are, in fact, lower than Orshansky's PL. This method also permits the computation of a lower and upper

⁽²³⁾ Assuming food share of the lowest quintile as calculated from expenditure distribution.

Table 4. Construction of the Food Poverty Line

Good	Ration (Kg/Yr)	Ration (gr/Day)	Calories (100 Grs)	Price (1995)	Expenditure (Year)	FEI (Daily)
Bread	45.30	124.10	250.00	5.76	1043.72	310.00
Flour	8.20	22.46	233.00	15.73	129.17	52.33
Semoulina	105.20	288.20	232.00	1248.88	2627.64	671.51
Rice	1.00	2.74	361.00	30.57	30.57	9.88
Pasta	6.70	18.35	360.00	54.79	367.09	66.06
Wheat	31.40	86.02	232.00	24.96	783.74	199.56
Potatoes	30.00	82.19	80.00	23.51	705.30	65.75
Dried Veggies	6.50	17.81	96.00	30.95	201.75	117.09
Fresh Veggies	50.00	136.98	14.00	25.19	1259.50	19.18
Sugar	23.50	64.38	394.00	44.53	1046.46	253.65
Meat	18.00	49.31	203.00	99.94	1798.92	100.09
Milk	80.00	219.17	35.00	10.75	860.00	76.70
Fish	4.00	10.95	294.00	45.82	183.28	32.19
Fat-oil	13.00	35.62	881.00	283.65	737.49	313.77
Eggs	3.00	8.22	63.00	4.96	243.04	5.18
Sum					12017.00	2100.00

Source: Author's Own Calculations

PL. (Table 5). Given the fact that the various computed poverty lines fall within the values of the lower and upper poverty lines, it is correct to take these two levels as reflecting the range of variation or the degree of uncertainty associated with the estimation of the poverty lines.

Table 5. Alternative Estimates of poverty Lines

	1966/67	1979/80	1988	1995
Food Poverty Line	519	1399	2766	12017
Lower Poverty Line	701	1826	3734	16223
Upper Poverty Line	847	2207	4513	19607
Poverty Line (Orshansky)	798	2152	4255	18488
Non food Basic Expenditure	185	481	985	4279
Cost of Basic Needs	704	1880	3751	16296
Ravallion	766	1998	4085	17747
World Bank	*****	*****	3250	17200
\$1 US a Day	1400	1400	2158	17396

Source: Author's Own Calculations

The above mentioned methods are based on scaling up the FPL by a fraction which was justified by different arguments. The direct estimation of the non-food component could be based on an ad-hoc choice of basic necessary expenditure. This choice could be explained and justified as basic need arguments, which have a long tradition in applied poverty analysis since the work of Rowntree. By looking at the non-food expenditure of the lowest quintile, it is fair to consider that clothing and furniture, housing, health, transport, and

⁽²⁴⁾ Poverty lines used by the World Bank were calculated by the author from published poverty levels figures given in World Development Report (2000).

education could be considered as components of basic non-food expenditures. By adding the poor's expenditure on these components we computed non-food expenditure based on the Cost of Basic Needs (CBN) which are given in Table 5. The figures of the PLs obtained from CBN give the nearest estimates to the lower PLs.

These estimates could be regarded as reliable figures of the cost of basic needs in Algeria and could be used for the evaluation of poverty levels. More work is needed in order to reconcile these figures. One way to move forward is to have more detailed data on expenditure, as the lack of detailed data increases easily increases the error margin of the PL estimates. Also some methods are based on different methodologies, are not comparable, and indeed give different outcomes. However lower and upper PLs could be regarded as the margin of variability of these lines.

In order to highlight these findings, Table (6) summarises the main poverty parameters between 1967 and 1995. Mean expenditure in current terms increased from 1,636⁽²⁵⁾ AD in 1966 to 35,263 AD in 1995. In terms of PPP, in 1985 international prices⁽²⁶⁾ average expenditure increased substantially between 1966 and 1980, whereas it declined severely afterwards, reflecting a sharp decline in the welfare of the population. The lower and upper poverty lines also followed this pattern, because they were estimated using the same inflation figures. The lower poverty line as a proportion of the mean expenditure fluctuated between 41% and 58%, whereas the upper poverty line was between 50% and 70%. These ranges reflect plausible estimates of PLs. In fact these proportions are not far from those reported by Demery and Squire (1996) for some African countries.

Table 6. Main Poverty Parameters 1966-1995

	1966	1980	1988	1995
Current Prices				
Mean Expenditure	1636	3122	8784	35263
Gini Index	30.51	34.37	38.76	35.88
Lower PL	731	1798	3587	16913
% Mean Expenditure	44.68	57.59	40.84	47.96
Upper PL	924	2273	4534	21381
% Mean Expenditure	56.48	72.81	51.62	60.63
PPP 1985 International Prices				
Mean Expenditure	742	1503	1395	1258
Lower PL	327	869	570	603
Upper PL	414	1098	720	763

Source: Author's Own Calculations

⁽²⁵⁾ This figure was derived from the survey data and corresponds only to the average expenditure of Algiers City. Macroeconomic data indicates that mean households consumption for 1966 was 778 AD only.

⁽²⁶⁾ ² Figures computed from the Summers and Heston (1991) International Comparison Program (ICP) data.

All the data concerning per capita distribution and the calculation of poverty lines were taken from various official sources. The data for the 1966 survey published by the AARDES (1968) covers Algiers only. Poverty estimates at the national level assumed the same expenditure pattern. The aggregate results should be read with extreme caution as in 1966 more than 60% of the population was rural. The 1979/80 expenditure survey published by MPAT (1980), covers the whole country in more detail, both geographically and socially. The 1988 expenditure survey results, published by ONS (1988), although covering the whole country are less detailed than in 1988. The 1995 data were taken from a published note by the ONS (1997). This survey was conducted as an LSMS as a part of the structural adjustment program applied by Algeria between 1994 and 1998. The published data of these surveys were sufficient to estimate aggregate poverty indicators that are reported in the appendix. All the data are expressed in per capita terms not as a household average.

Estimation of Poverty Levels and trends

After having estimated and chosen the relevant poverty lines, and using per capita expenditure distribution for the 1966, 1980, 1988, and 1995 consumer surveys, the various poverty measures were calculated using POVCAL of Chen, Datt and Ravallion (1992). Aggregate and sectoral poverty levels for survey years are summarised in Table 7 and Table 8. According to these estimates the proportion of poverty as measured by the head count was 54% in 1966 and dramatically declined to 28% in 1980. This was due the real appreciation of per capita consumption and an improvement in the income distribution. The decline in the degree of poverty continued through to 1988, where the head count decreased to just 16%. After 1979, per capita expenditure was further improved as higher oil windfalls permitted the financing of a consumer boom in the first half of the eighties. However, the prompt decline in oil price, the acceleration of inflation and the decline in per capita income pushed the proportion of poverty to 22% giving an increase of 38% between 1988 and 1995. This increase could have been even worse if the government had lifted subsidies earlier than 1994. By applying the upper poverty line the head count decreased from 71% in 1966 to 26.71 % in 1988 and then increased to 33.25% in 1995. The pace of decline in absolute poverty between 1966 and 1995 was 60% compared to 53% for the relative poverty. The differences were caused by the fact that 7% of the population in 1995 crossed the lower poverty line, but were still regarded as poor by the upper poverty line. The difference in the head count between the lower and upper poverty line declined from 18% in 1966 to just 11% in 1995.

Table 7. Aggregate Poverty Measures for Algeria 1966-1995

Lower PL																				
	196/67(Nationwide)				1966/67 (Algiers)				1979/80				1988				1995			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	53.67	-1.41	0.05	0.04	14.91	-1.69	2.10	1.24	28.01	-1.79	1.32	0.74	15.81	-2.54	3.68	1.45	21.83	-1.97	2.13	1.08
P1	20.32	-1.64	1.10	0.67	5.38	-1.77	4.43	2.50	8.55	-2.28	3.42	1.50	3.28	-3.82	7.98	2.09	5.83	-2.74	5.06	1.85
P2	10.94	-1.72	2.14	1.25	2.75	-1.91	6.84	3.58	3.59	-2.76	5.51	2.00	0.92	-5.12	12.31	2.41	2.11	-3.52	7.99	2.27
Upper PL																				
	196/67(Nationwide)				1966/67 (Algiers)				1980				1988				1995			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	71.12	-0.97	-0.18	-0.18	22.26	-1.72	1.33	0.77	41.38	-1.52	0.56	0.37	26.71	-1.98	1.86	0.94	33.25	-1.63	1.06	0.65
P1	29.19	-1.43	0.56	0.39	8.11	-1.74	3.12	1.79	14.01	-1.95	2.10	1.08	7.02	-2.80	4.56	1.63	10.36	-2.21	3.08	1.40
P2	16.17	-1.61	1.35	0.84	4.25	-1.82	4.94	2.72	6.49	-2.31	3.61	1.56	2.51	-3.60	7.26	2.02	4.36	-2.74	5.08	1.85

The poverty gap (P1) estimated using the lower poverty line which measures the shortfall in expenditure was estimated at 20% in 1966, declined to just 8.55% in 1980, and declined further to just 3.28% in 1988, but increased to 5.83% in 1995. This trend decline in P1 would suggest that poverty alleviation by transferring income from non-poor to poor people by means of perfect targeting would represent only a fraction of the cost as compared to universal food subsidy cost.

The depth of poverty (P2), which summarises expenditure inequality distribution among the poor, also reflects an important fact about poverty distribution in Algeria. The index declined from 10.94% in 1966 to just 2.11% in 1995. Low P2 figures mean that in poverty alleviation strategies, the choice of who first to lift out poverty is risk neutral. The sensitivity of poverty indices to growth and inequality are measured by their corresponding elasticities. The various estimates show that the positive impact of expenditure growth on poverty is very strong. The growth elasticity with respects the head count ratio increased from -1.41 in 1966 to -2.54 in 1988 but declined to -1.97 in 1995. Holding income distribution and cost of living constant, a real 11% increase in per capita expenditure would almost eliminate poverty in Algeria using 1995 figures. Despite the stability of income distribution during the years (see Tables 9 and 10) the expenditure distribution across brackets suggests that inequality elasticity is as important as growth elasticity. An increase of 1% in Gini coefficient would worsen poverty level by 2.13%, the poverty gap by 5.06%, and poverty severity by 7.99% for 1995. The Marginal Proportional Rate of Substitution (MPRS) measures how much growth is needed in order to offset the negative impact of inequality on poverty indicators. According to estimated MPRS's a worsening of income distribution would need as much as growth in order to offset its impact on the head ratio. However, twice as much as growth is needed in order to halt worsening in the poverty gap and poverty severity. In this context a growth policy that worsens income distribution would harm the poor instead of benefiting them. A proper growth policy would combine some redistribution policies and poverty alleviation schemes in order enhance the process of "trickling down" of growth.

The aggregate poverty measures reported above were further detailed across sectors in order to enhance the poverty profile. Table 8 reports sectoral poverty indicators for 1988 and 1995. The expenditure data was split into rural and urban, however, the same poverty line was applied to both sectors. According to the lower poverty line, the aggregate poverty level was 15.81% in 1988 compared to 21.83 % in 1995. The urban poverty level was 11.89% in 1988 and increased to 16.18 % in 1995. Rural poverty level increased from 26.06 % in 1988 to just

Table 8. Sectoral Poverty indicators

Lower PL	1988											
	Total				Urban				Rural			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	15.81	-2.54	3.68	1.45	11.89	-3.27	5.22	1.60	26.06	-1.97	2.00	0.98
P1	3.28	-3.82	7.98	2.09	1.97	-5.05	10.98	2.17	6.91	-2.75	4.88	0.56
P2	0.92	-5.12	12.31	2.41	0.44	-6.96	16.78	2.41	2.47	-3.58	7.72	0.46
Upper PL	1988											
	Total				Urban				Rural			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	26.71	-1.98	1.86	0.94	22.26	-2.28	2.50	1.10	39.32	-1.56	0.94	0.60
P1	7.02	-2.80	4.56	1.63	5.12	-3.34	5.76	1.72	12.30	-2.19	2.93	1.34
P2	2.51	-3.60	7.26	2.02	1.60	-4.42	9.02	2.04	5.16	-2.76	4.87	1.76
Lower PL	1995											
	Total				Urban				Rural			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	21.83	-1.97	2.13	1.08	16.18	-2.30	3.02	1.31	27.36	-1.80	1.55	0.86
P1	5.83	-2.74	5.06	1.85	3.71	-3.36	6.70	1.99	7.88	-2.46	3.98	1.62
P2	2.11	-3.52	7.99	2.27	1.17	-4.39	10.40	2.37	3.08	-3.12	6.39	2.05
Upper PL	1995											
	Total				Urban				Rural			
	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS	Value	Growth Elasticity	Gini Elasticity	MPRS
Po	33.25	-1.63	1.06	0.65	26.30	-1.88	1.56	0.83	40.23	-1.48	0.69	0.47
P1	10.36	-2.21	3.08	1.40	7.38	-2.56	3.96	1.55	13.31	-2.02	2.42	1.20
P2	4.36	-2.74	5.08	1.85	2.82	-3.24	6.3542	1.96	5.92	-2.50	4.11	1.65

Source: Author's Own Calculations

Table 9. Income Distribution indicators 1966-1995

	Atkinson				Thiel	Gini	CV
	0.1	0.5	1	2			
Algiers1966	0.08	0.20	0.31	0.55	0.21	30.51	0.74
Rural 1980				0.47	1.16	33.32	1.08
Algiers 1980	0.04	0.14	0.42	0.54	0.21	31.76	0.70
1980				0.54	0.30	34.37	0.96
Rural 1988			0.04	0.22	0.62	40.13	1.11
Urban 1988	0.08	0.17	0.21	0.39	0.19	38.83	0.81
1988	0.02	0.12	0.21	0.35	0.25	38.76	0.84
1995 Rural			0.27	0.25	0.35	36.28	0.81
1995 urban	0.12	0.19	0.27	0.40	0.09	34.58	0.65
1995	0.02	0.10	0.19	0.33	0.20	35.88	0.72

Source: Author's Own Calculations

Table 10. Patterns of Consumption Distribution between 1988 and 1995

Decile	total 95	Total 88	Change	Urban 95	Urban 88	Change	Rural 95	Rural 88	Change
1	0.03	0.03	0.00	0.02	0.02	0.00	0.04	0.05	-0.01
2	0.04	0.04	0.00	0.03	0.03	0.00	0.06	0.07	-0.02
3	0.05	0.05	0.00	0.04	0.04	0.00	0.06	0.07	-0.01
4	0.06	0.06	0.00	0.05	0.05	0.00	0.08	0.08	0.00
5	0.07	0.07	0.00	0.07	0.07	0.00	0.08	0.08	0.00
6	0.09	0.08	0.01	0.08	0.08	0.00	0.10	0.09	0.01
7	0.10	0.09	0.01	0.11	0.10	0.01	0.10	0.09	0.01
8	0.12	0.11	0.01	0.13	0.12	0.01	0.12	0.11	0.02
9	0.16	0.15	0.01	0.18	0.16	0.02	0.14	0.12	0.02
10	0.27	0.32	-0.05	0.31	0.34	-0.03	0.23	0.25	-0.02
Total	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00

Source: Author's Own Calculations

27.36 in 1995. Using population distribution between urban and rural sectors for 1988 and 1995 the weighted contribution of sectors to aggregate poverty is presented in Table 12. Despite the increase in urban poverty proportion, its contribution to aggregate poverty declined from 54 % in 1988 to just 37% % in 1995. By contrast the share of urban poverty severity increased between the two periods.

In order to understand the disparities in poverty across sectors, the impact of unequal expenditure means was simulated and results are reported in Table 11. By assuming equal expenditure means set at the aggregate level, the differences between actual and simulated poverty indicators at the aggregate level would not change significantly. Poverty across sectors would be redistributed significantly resulting in an increase of urban poverty by 26.3% in 1988 and 25.6 % in 1995. Rural poverty would be decreased significantly by 33% in 1988 and by 19.58% in 1995. The results of this exercise reflect the policy choice in eradicating poverty by just closing the gap in income disparity between rural and urban sectors. The population dynamics and its interactions between sectors would impact poverty between different periods. Population dynamics impact on poverty could also be decomposed into

intra-sectoral effects, population shift, and interaction shift. The results of this decomposition, shown in Table 13, reveal that the increase in poverty indicators between 1988 and 1995 was mainly due to the intra-sectoral effects. The urban intra-sectoral effects are more pronounced than rural sector effects. Inter-sectoral population shift had a positive impact on poverty indicators, because of the population transfer from a high poverty region to a low poverty region, due principally to high internal migration (Benachenhou, 1982). The interaction effects increased poverty indicators, but only marginally.

Rural poverty is more or less double urban poverty. This structure is inherited from the colonial period as clearly reflected by the poverty measures of 1966. In that year nationwide poverty was estimated to 53.67% compared to just 14.91% for Algiers. At that time urbanization was less than 40%. The decline in aggregate poverty was 38% between 1988 and 1995. However urban poverty worsened by as much as 36% compared to only 4.98% for rural poverty over the same period. These results are understandable for the case of Algeria where urban population are more subjected to the decline of public employment, mostly urban, and to wage freezes and price increases. However, the rural population is mostly food producers working to their own account, and thereby less vulnerable to price and income fluctuations than their urban counterparts.

The increase in poverty indicators between sectors and at the aggregate level could be decomposed into growth and inequality effects, and to a residual that could not be accounted for. Results in Table 14 show that the decline in aggregate poverty between 1980 and 1988 by 12.2 % was mainly due to growth (-13.87%), however the increase in the Gini index would have contributed by 4.83 % but other factors as captured by the residual offset this increase. This pattern was totally reversed between 1988 and 1995. Aggregate poverty proportion increased by 6.02 % due to a 7.14% decline in growth. This was, however, moderated by an improvement in income distribution of -1.13%. The 1.3% increase in rural poverty was caused by a 4.58% decline in growth. However, this was strongly moderated by the improvement in income distribution, which decreased poverty by 2.77 %.

Table 11. Partial Contribution of Sectoral Disparities in Means to Aggregate Poverty

Measures	1988						1995					
	Observed	Urban		Observed	Rural		Observed	Urban		Observed	Rural	
		Simulated	Contribution of Unequal Means									
Po	11.89	15.02	0.26	26.06	17.32	-0.34	16.18	20.33	0.26	27.36	22.00	-0.20
P1	1.97	2.83	0.44	6.91	3.85	-0.44	3.71	5.17	0.39	7.88	5.84	-0.26
P2	0.44	0.72	0.65	2.47	1.14	-0.54	1.17	1.79	0.53	3.08	2.10	-0.32

Measures	1988			1995		
	Observed	Simulated	Contribution of Unequal Means	Observed	Simulated	Contribution of Unequal Means
Po	15.81	15.65	-0.01	21.83	21.16	-0.03
P1	3.28	3.97	0.21	5.83	5.50	-0.06
P2	0.92	0.83	-0.10	2.11	1.94	-0.08

Source: Author's Own Calculations

Table 12. Contribution of Sectoral Poverty to Aggregate poverty

Measures	1988			1995		
	Value	Urban Share	Rural Share	Value	Urban Share	Rural Share
Po	15.81	54.14	45.85	21.83	37.05	62.94
P1	3.28	43.13	56.86	5.83	31.82	68.17

Source: Author's Own Calculations

Table 13. Decomposition of Changes in Poverty into Intersectoral Effects, Population Shifts

Measures	Change	Intersectoral Effects		Intersectoral Population shifts	Interaction Effects
		Urban	Rural		
Po	2.53	2.40	0.65	-0.85	0.18
P1		0.87	0.49	-0.30	0.05
P2	1.19	0.41	0.31	-0.12	0.01

Source: Author's Own Calculations

Table 14. Decomposition of Changes in Sectoral Poverty in Algeria 1988/1995

Rural				
	Total Change	Growth	Inequality	Residual
Po	1.30	4.58	-2.77	-0.51
P1	0.97	1.76	-0.59	-0.20
P2	0.61	0.66	-0.14	0.09

Urban				
	Total Change	Growth	Inequality	Residual
Po	4.29	5.58	-0.32	-0.97
P1	1.74	1.60	0.29	-0.15
P2	0.73	0.54	0.16	0.03

Aggregate				
	Total Change	Growth	Inequality	Residual
Po	6.02	7.14	-1.13	0.01
P1	2.55	2.39	0.01	0.15
P2	1.19	0.98	0.01	0.20

Decomposition of Changes in Aggregate poverty 80/88

Aggregate				
	Total Change	Growth	Inequality	Residual
Po	-12.20	-13.87	4.83	-3.16
P1	-5.27	-5.08	0.84	-1.02
P2	-2.67	-2.43	0.00	-0.24

Source: Author's Own Calculations

The regional distribution of poverty in 1980 and 1988 is given in Table 15 and 17 and presents a detailed poverty profile for Algeria. Detailed data for 1995 were not published. Poverty computation reveal that in 1980 income poverty among the low-income category was double that of the medium income categories. In 1980, state officials were the least poor in the country. Peasants were the worst off followed by urban workers. The average expenditure of the self-employed was not far from that of workers and given their head count ratio, they could be regarded as a poor category. Combating poverty requires targeting low-income groups, such as peasant workers and the self-employed. The regional distribution of poverty indicators does not reveal the wide differences in social categories. However, the urban zones

Table 15. Regional poverty Profile, Algeria, 1980

	National	Algiers	Large Towns	Medium Towns	Small Towns	Villages	Rural
Mean Expenditure	3123.00	4249.00	3852.00	3906.00	3430.00	3225.00	2471.00
Gini Index	34.38	31.76	28.98	30.91	32.56	27.09	33.32
Lower Poverty Line							
Head Count	28.01	10.36	11.17	13.39	20.47	14.97	40.84
Growth Elasticity	-1.79	-2.79	-3.58	-2.10	-2.41	-2.79	-1.61
Inequality Elasticity	1.32	3.81	4.09	2.46	2.20	2.21	0.60
MPRS	0.74	1.37	1.14	1.17	0.91	0.79	0.37
Poverty Gap	8.54	2.13	1.68	4.02	4.65	3.50	13.03
Growth Elasticity	-2.27	-3.85	-5.61	-2.32	-3.39	-3.26	-2.13
Inequality Elasticity	3.41	7.61	8.55	4.89	5.01	4.38	2.17
MPRS	1.50	1.98	1.52	2.11	1.48	1.34	1.02
Poverty Severity	3.59	0.61	0.34	1.73	1.45	1.19	5.67
Growth Elasticity	-2.75	-4.99	-7.70	-2.64	-4.41	-3.87	-2.59
Inequality Elasticity	5.50	11.53	13.08	7.44	7.85	6.66	3.71
MPRS	2.00	2.31	1.70	2.82	1.78	1.72	1.43
Upper Poverty Line							
Head Count	41.38	19.01	22.66	21.97	34.01	28.42	57.01
Growth Elasticity	-1.52	-2.42	-2.59	-2.11	-1.93	-2.65	-1.22
Inequality Elasticity	0.57	2.10	1.79	1.51	0.99	1.11	0.10
MPRS	0.38	0.87	0.69	0.72	0.51	0.42	0.08
Poverty Gap	14.01	4.72	4.84	6.84	9.36	7.22	20.58
Growth Elasticity	-1.95	-3.03	-3.68	-2.21	-2.63	-2.93	-1.76
Inequality Elasticity	2.10	4.49	4.25	3.30	2.86	2.64	1.24
MPRS	1.08	1.48	1.15	1.49	1.09	0.90	0.70
Poverty Severity	6.49	1.65	1.42	3.11	3.53	2.74	9.89
Growth Elasticity	-2.31	-3.69	-4.79	-2.38	-3.29	-3.27	-2.16
Inequality Elasticity	3.61	6.95	6.71	5.11	4.71	4.20	2.36
MPRS	1.56	1.88	1.40	2.15	1.43	1.28	1.09

Source: Author's own calculations

are the least poor when compared to mountain dwellers and those living on the High Plateau and in the Sahara. More detailed data on regional poverty distribution, given in Table 16, reveals that poverty is severe in small rural villages as compared to large urban cities and urban villages. In 1988, the situation of all social categories improved when compared to 1980. Seasonal agricultural workers are the most poor, followed by workers and self-employed. Despite the fact that the head count ratio declined considerably between 1980 and 1988, it seems that the social map of poverty did not change considerably.

The Algerian population increased from 12.24 million in 1966 to 28.06 million in 1995. During the same period the proportion of the rural population declined from 61.6 % in 1966 to just 43.4% in 1995. Applying the poverty proportion, calculated using the lower poverty line, gives the evolution of the number of poor between 1966 to 1995 (Table 19). The number of rural poor declined from 4.04 m to 3.319 m in 1995 however registered an increase of 8.5% between 1988 and 1995 despite the decline in income inequality. The number of urban poor increased from 0.7 m in 1966 to more than 2.5 m in 1995. The rate of increase between 1988 and 1995 was more than 79 %. This of course was amplified by the rapid increase of the urban population by 3.8 m and the rapid increase of the head count from 11.89% to 22.26 %.

It was mentioned above that the poverty gap could be used to measure the amounts of money needed to transfer from non-poor to the poor in order eradicate poverty under different hypotheses of targeting. In the event of perfect targeting, of knowing the poor and their incomes, the elimination of the shortfall in 1995 would require the state to supplement individual expenditure only by 986 AD per annum (Table 20), which represents a small proportion, around 6%, of the poverty line. This is so because the poverty gap in 1995 was only 5.83%. Closing the total gap would require AD 27.67 B, which represents 1.4% of GDP, less than the cost of direct food subsidy. In the case of a broader perfect targeting which ignores the amount of the shortfall, and transfers the whole amount of the poverty line to all identified poor, the cost would rocket AD 99 B (5% of GDP). This figure would quadruple to 474 billion AD if the amount is distributed to the whole population as in the case of imperfect targeting.

Table 16. Social and Regional poverty Profile, Algeria, 1980

	Average Expenditure	Head Count	Growth Elasticity	Inequality Elasticity	MPRS	Poverty Gap	Growth Elasticity	Inequality Elasticity	MPRS	Poverty Severity	Growth Elasticity	Inequality Elasticity	MPRS
Employers and Liberal Profession	4381.00	14.19	-2.45	3.52	1.44	3.57	-2.97	6.70	2.26	1.37	-3.19	9.46	2.97
Sel Employed	2911.00	31.69	-1.71	1.06	0.62	9.99	-2.17	2.96	1.36	4.33	-2.61	4.85	1.86
State Officials	4828.00	11.04	-2.70	4.56	1.69	2.65	-3.16	8.01	2.53	1.00	-3.28	10.90	3.32
Qualified Workers	3611.00	21.36	-1.95	1.96	1.01	6.03	-2.54	4.56	1.80	2.34	-3.15	7.19	2.28
Workers	2799.00	33.87	-1.67	0.93	0.56	10.86	-2.11	2.73	1.29	4.79	-2.53	4.52	1.79
Peasants	2043.00	53.91	-1.25	0.17	0.14	19.85	-1.71	1.37	0.80	9.81	-2.04	2.55	1.25
Others	3127.00	27.95	-1.79	1.32	0.74	8.52	-2.28	3.42	1.50	3.57	-2.76	5.52	2.00
Non-declared	3268.00	25.79	-1.84	1.50	0.82	7.69	-2.35	3.74	1.59	3.15	-2.87	5.98	2.08
High Income Category	4691.00	11.92	-2.63	4.23	1.61	2.90	-3.10	7.61	2.45	1.10	-3.26	10.46	3.21
Medium Income Category	3191.00	26.94	-1.81	1.40	0.77	8.13	-2.31	3.56	1.54	3.38	-2.81	5.72	2.04
Low Income Category	2530.00	39.88	-1.55	0.63	0.41	13.36	-1.98	2.21	1.12	6.13	-2.35	3.77	1.60
Urban Zone	3698.00	20.37	-1.97	2.09	1.06	5.67	-2.59	4.79	1.85	2.16	-3.22	7.52	2.34
Inner Cities	2838.00	33.09	-1.69	0.97	0.57	10.55	-2.13	2.81	1.32	4.62	-2.55	4.63	1.82
Mountains	2625.00	37.63	-1.60	0.73	0.46	12.41	-2.03	2.39	1.18	5.62	-2.41	4.03	1.67
Stepps and Sahara	2694	36.08	-1.63	0.81	0.50	11.77	-2.06	2.52	1.22	5.27	-2.46	4.22	1.72

Source: Author's Own Calculations

Table 17. Social Poverty Profile, Algeria, 1988

	Employers	Self Employed	High Level Officials and Liberal Professions	Mid- Level Officials	Workers	State Employees	Saisonal Workers	In Transition	Others	Inactive
Mean Expenditure	12263	8506	16798	11293	8138	10408	7047	8443	9181	9427
% Persons	1.91	19.40	2.09	7.71	18.30	6.92	15.70	0.45	8.13	19.7
Lower Poverty Line										
Head Count	4.86	16.00	1.56	6.53	17.00	8.56	25.46	16.33	12.86	11.87
Growth Elasticity	-3.63	-2.74	-3.39	-3.51	-2.67	-3.33	-2.20	-2.72	-2.97	-3.05
Inequality Elasticity	8.80	3.76	12.49	7.55	3.53	6.34	2.12	3.68	4.64	4.97
MPRS	2.42	1.37	3.68	2.15	1.32	1.90	0.96	1.35	1.56	1.63
Poverty Gap	1.13	3.83	0.45	1.49	4.11	1.96	6.72	3.92	2.99	2.74
Growth Elasticity	-3.29	-3.17	-2.48	-3.38	-3.12	-3.39	-2.78	-3.15	-3.29	-3.32
Inequality Elasticity	11.39	6.71	13.81	10.41	6.44	9.35	4.65	6.62	-3.17	8.03
MPRS	3.46	2.12	5.57	3.08	2.06	2.76	1.67	2.10	-0.96	2.42
Poverty Severity	0.50	1.47	0.26	0.61	1.58	0.78	2.66	1.51	1.15	1.06
Growth Elasticity	-2.57	-3.18	-1.40	-2.82	6.44	-3.01	-3.04	-3.18	-3.17	-3.15
Inequality Elasticity	13.06	9.11	14.54	12.35	8.83	11.52	6.86	9.02	10.06	10.38
MPRS	5.08	2.86	10.39	4.38	-1.37	3.83	2.26	2.84	3.17	3.30
Upper Poverty Line										
Head Count	10.86	28.10	3.63	13.93	29.42	17.46	39.82	28.54	23.79	22.37
Growth Elasticity	-3.14	-2.08	-3.67	-2.89	-2.02	-2.64	-1.63	-2.06	-2.28	-2.35
Inequality Elasticity	5.35	1.82	9.94	4.31	1.68	3.43	0.96	1.77	2.34	2.54
MPRS	1.70	0.88	2.71	1.49	0.83	1.30	0.59	0.86	1.03	1.08
Poverty Gap	2.49	7.63	0.87	3.27	8.09	4.24	12.16	7.78	6.17	5.72
Growth Elasticity	-3.35	-2.68	-3.14	-3.25	-2.63	-3.11	-2.27	-2.66	-2.85	-2.9
Inequality Elasticity	8.42	4.22	12.21	7.33	4.03	6.32	2.81	4.16	4.94	5.21
MPRS	2.51	1.57	3.89	2.26	1.53	2.03	1.24	1.56	1.73	1.80
Poverty Severity	0.97	3.06	0.40	1.26	3.27	1.64	5.21	3.13	2.43	2.24
Growth Elasticity	-3.12	-2.97	-2.29	-3.18	-2.94	-3.18	-2.66	-2.96	-3.08	-3.11
Inequality Elasticity	10.72	6.36	13.60	9.72	6.12	8.71	4.58	6.28	7.2	7.51
MPRS	3.44	2.14	5.94	3.06	2.08	2.74	1.72	2.12	2.34	2.41

Source: Author's own calculations

The government shifted away from direct food and services subsidy because of its exorbitant costs to the budget. This subsidy was replaced by a system of direct help to those unable to work, in addition to other schemes designed for those able to work. Those working and paid at the minimum wage or less would receive less than the poverty line and would be excluded from the poverty alleviation programs, while losing welfare in terms of forgone consumption as a result of this transformation in the form of help to the poor. Therefore, people not receiving direct cash and earning less than a per capita poverty line would be trapped into poverty. For example, the minimum wage was only AD 5600 per month in 1995. For a family of seven and a single wage earner, this amount represent only 56% of the poverty line. The situation is even worse for someone working in a PWP, or for someone receiving direct cash help from the social fund. Government should use these tools (minimum wage, direct cash transfers, public work programs) in relation to the estimates of the poverty line in order to seriously alleviate poverty. The minimum wage would have to have been set at AD 9,865 instead of AD 5,600 in order to enable a minimum wage earner family of seven to escape poverty in 1995.

The results on poverty presented above were based on the lower poverty line that took into consideration the non-satisfaction of basic needs. Poverty alleviation strategies should rank poverty according to its severity and depth. In this context, priority should be given to the elimination of extreme or ultra poverty. Table 18 gives some estimates of extreme poverty in Algeria based on the non-attainment of food poverty line and 80% of this line as postulated by Lipton (1983). The proportion of people living in extreme poverty declined consistently between 1966 and 1980. It reached 1.54% when 80% of FPL was used as an anchor. However the extreme poverty increased between 1988 and 1995 to almost 4.39% of the population. This implies that 1.23 million people experienced extreme poverty in 1995. Their average annual spending was ,8584.35 AD giving an expenditure shortfall of 8,328.65 AD. Eliminating such poverty would require the state to transfer to them around AD 10.25 billion which represent only 0.005% of GDP in 1995.

Table 18. Population Living in Extreme Poverty

Food Poverty Line	1966	1980	1988	1995
P0	29.66	17.26	6.98	9.83
P1	10.84	4.55	0.89	1.79
P2	5.73	1.65	0.15	0.44
80% of Food Poverty Line				
P0	20.18	10.41	1.54	4.39
P1	7.34	2.25	0.06	0.47
P2	3.83	0.66	0.00	0.07

Source: Author's Own Calculations

Table 19. Population Living in Poverty, millions

	1966	1980	1988	1995
Population	12.24	18.67	23.78	28.06
Rural (% of total population)	61.6	56.5	49.4	43.4
Urban population	4.70	8.12	12.03	15.88
Rural Population	7.54	10.55	11.75	12.18
Rural poor	4.04	4.22	3.06	3.32
Urban Poor	0.70	1.01	1.43	2.57
Total	4.74	5.23	4.49	5.89

Source: Author's Own Calculations

Table 20. Cost of Poverty Elimination under Perfect Targeting

	1966	1980	1988	1995
GDP, Bn AD	15	163	348	1966
Poor's Mean Income, AD	336	1637.46	2962	12213
Poverty Gap	20.32	2.5	3.28	5.83
Head Count Ratio	38	28	18.83	20.98
Number of poor, Millions	4.744	5.229	4.48	5.888
Cost of Eliminating Poverty, Bn AD	1.871	0.839	2.799	27.673
Cost as a percent of GDP	12.47	0.005	0.008	0.014

Source: Author's Own Calculations

Expenditure distribution data allows assessing the inequality and income distribution situation for the years considered. Income inequality of Atkinson, Thiel, Gini, and Coefficient of Variations are given in Table 9. Comparing the Gini coefficients with those published by Deininger and Squire (1996) and in WDR (2000) for various LDCs confirm that income inequality in Algeria is moderate. According to the data in 1966, the Gini index for Algiers was 30.74. Thanks to the egalitarian policies of the seventies, the index increased only marginally between 1966 and 1980. The index further increased in 1988 to 38.79. The deterioration of income distribution in parallel with real consumption decline, meant that low-income categories bore most of the welfare loss. The increase is more pronounced for rural areas where Gini increased from 33.32 in 1980 to 40.13. It is very difficult to reconcile this pattern with rural policies and radical agricultural reforms that were in favor of land-less peasants. This seeming conflict could be the result that land redistribution was not sufficient to generate sustainable incomes of the peasants working in the cooperatives. In fact the total failure of the land reforms of the seventies pushed the government to reverse the process of collectivization and handing back the land to its original owners.

In 1995, the Gini index decreased to 35.88 and the same happened for both rural and urban. This was accompanied by a real decline in average per capita consumption. In fact, it is very difficult to understand such an improvement in distribution in times of economic liberalization. It could be only a result of bad sampling and survey design. To understand

what happened to the Gini index, Table 10 compares expenditure distribution between 1988 and 1995. The distribution of the bottom half did not change for the urban sector, whereas this segment lost about 5% in the rural sector. The top decile in the aggregate distribution lost about 5% in favor of the lower deciles in the upper half. The urban population followed the same pattern. However, the rural top decile lost 2%, further reinforcing the upper half of the distribution density. These changes are probably the result of the restructuring policies operating since the early nineties. The decline in public sector employment, currency devaluation and inflation and the gradual liberation of the economy are the potential candidates that shifted the expenditure distribution.

Table (10) could also be used for dominance analysis. It is clear that both aggregate distributions do not intersect except at the top decile. As poverty comparison would exclude shifting the poverty line beyond the bottom half, it is safe to conclude that poverty comparison between 1988 and 1995 are robust. This is not true for the rural densities where they intersect at the sixth decile. Comparing beyond this point would make the comparison inconsistent. Given the fact that poverty lines give a poverty proportion of no more than 41%, which corresponds to the third decile, it is safe to compare rural poverty between 1988 and 1995 within the limits of the lower and upper poverty lines.

The government shifted its social policy from direct food subsidy that cost the treasury more than 5% of GDP in 1995 to a system of direct help. The reforms considerably reduced the cost, but did not permit the improvement of poverty indicators, although it appears that income poverty did not deteriorate considerably between 1995 and 1999. Despite a rapid decline of inflation from 29.8% in 1995 in to just 2.6% in 1999 (see Table 22), real mean expenditure stagnated between 1995 and 1999. Assuming no significant change in income distribution between 1995 and 1999, simulating the growth of real per capita expenditure on the 1995 distribution gave a stationary poverty indices for this period. Real mean per capita expenditure increased from 8,940 AD in 1995 to just 9,045 AD in 1999. Despite a rapid disinflation in this period, growth of expenditure was insignificant. This poor record is the direct result of the stringent demand management policies applied during the eighties.

The poverty alleviation package implemented since 1992 in relation to the phasing out of basic goods subsidy would trap people in poverty since cash transfer and the income of people in the bottom of the scale do not evolve faster than the poverty line. A few examples from reality would prove this point. Starting with wage earners, the legal monthly minimum wage of 8,000 AD applied since January 2001 represents approximately 4 times the poverty line. This salary will keep a family of four just on the poverty line. Given the fact that in Algeria the average family is composed of seven people, it is clear that a single minimum

wage earner could not keep his family out of poverty if not out of extreme poverty. In fact, even for average earner the outlook is not much different. In 1996, average wage was 5 times the poverty line. This is marginally higher than the minimum wage earner. The situation is even worse for people in public work programs, where the wage is only half the legal minimum. This means that only two people could be kept on the poverty line. As for people receiving the government cash transfer of 900 AD per month plus child benefit of 120 AD, the average take home transfer is only 6,120 AD per person. This figure represents only 27% of the poverty line.

The actual social safety net is not designed to lift all poor people out of poverty, but instead lessens poverty severity by providing income less than the poverty line. Despite strong trade union pressures and their role in wage setting through a national wage bargaining system, real wages declined severely, eroding real purchasing power of consumers. Between 1990 and 1996 wages of workers were increased by 136 % while inflation was 155%, thereby wages eroded by 18.8 %. Wage erosion was even higher for managers by 37% and was 28.4% for technicians and supervisors. Linking wages to inflation or anchoring minimum wages to poverty line would permit the alleviation of poverty. However, given low labor productivity and inelastic supply, it will only create an inflation spiral.

In the absence of a strong growth, poverty in Algeria will continue to remain high, reflecting the inability of current structural reforms in addressing the poverty problem in Algeria. In fact using Kanbur (1985) formula it would take nine years to bring initial mean income of the poor to the poverty line, assuming an equal proportional increase in income for every member of the population. Given the improvements in the oil price during 2000 where export proceeds registered a record high, medium term prospects for Algeria associated with a likely strong oil price outlook (2000-2004) were simulated by the IMF (2000). This exercise showed that future growth would be quite strong. Using the GDP growth figures for 2000-2004, it is expected that per capita real expenditure would increase steady from 1.6 % in 2000 to 4.20% in 2004. Given a low inflation outlook for the same period, the poverty line would increase by 3% from 23,774 Ad in 2000 to 26,758 AD in 2004. Mean expenditure would grow faster, from 50,835 AD in 2000 to 64,828 AD in 2004. The implied mean expenditure and poverty line growth was simulated using 1995 expenditure distribution.

This growth pattern would bring poverty down from its level in 1999 of 21.34 % to just 15.61 % in 2004 (Table 21). This exercise shows that strong real growth of around 4% pa in per capita expenditure is sufficient to substantially lower poverty in Algeria. Strong growth in Algeria is up to now associated with oil windfalls and does not necessarily mean good growth in non-hydrocarbon sectors. Given the decline in the manufacturing sector and the

Table 21. The Future of Poverty in Algeria, 1995-2004

Year	Nominal Mean Expenditure, AD	Real Mean Expenditure, AD	Real Mean Expenditure Growth	Nominal Mean Expenditure Growth	Poverty Line, AD	Head Count	Poverty Gap	FGT2
1995	35263.00	8940.47	0.60	30.40	16913.00	21.83	5.83	2.11
1996	42068.76	8986.75	0.60	19.30	20075.73	21.65	5.75	2.07
1997	43457.03	8780.44	-2.40	3.30	21220.05	22.59	6.20	2.44
1998	45890.62	8834.63	0.60	5.60	22281.05	22.33	6.11	2.40
1999	48139.26	9045.33	2.30	4.90	22860.36	21.34	5.76	2.24
2000	50835.06	9097.02	1.60	5.60	23774.77	20.68	5.52	2.14
2001	52919.30	9019.05	1.10	4.10	24488.01	20.21	5.37	2.07
2002	56517.81	9351.79	3.80	6.80	25222.66	18.69	4.85	1.83
2003	60474.06	9714.96	4.00	7.00	25979.33	17.16	4.34	1.62
2004	64828.19	10111.11	4.20	7.20	26758.71	15.61	3.85	1.41

Source: Author's Own Calculations

Table 22a. Human Development Index

	1995	1996	1997	1998
Rank	82	82	109	107
Life Expectancy at Birth (years)	67.8	68.1	68.9	69.2
Adult literacy rate (%)	59.4	61.6	60.3	65.2
Combined gross enrolment Ratio	66	66	68	69
Real GDP Per Capita \$PPP	5442	5618	4460	4792
HDI	0.737	0.736	0.665	0.683
GDPPC rank minus HDI rank	-17	-17	-31	-27

Source: Human Development Report, Various Issues

Table 22b. Human Poverty Index

	1995	1996	1997	1998
People not Expected to Survive to 40	10.6	9	9.1	8.8
Adult illiteracy rate	40.6	38.4	39.7	34.5
People without access to safe water	22	22	22	10
People without access to health services	2	2	--	
People without access to sanitation	13	9	9	9
HPI	28.6	27.1	28.8	24.8

Source: Human Development Report, Various Issues

Table 22c. Poverty Indicators for Maghreb Countries

	National Poverty Line, Poverty Proportion				International Poverty Line			Human Development	
	Year	Urban	Rural	National	Population Below 1 \$ PPP a day, %	Population Below 2 \$ PPP a day, %	Poverty Gap at \$2 a day, %	HDI 1997	HPI 1997
Algeria	1988	16.6	7.3	12.2					
	1995	30.3	14.7	22.8	<2	15.1	3.6	0.665	28.8
Mauritania	89-90			57.0	3.8	22.1	6.6	0.447	47.5
Morocco	90-91	18.0	7.6	13.1	<2	7.5	1.3	0.582	39.2
	98-99	27.2	12.0	19.0					
Tunisia	1985	29.2	12.0	19.9					
	1990	21.6	8.9	14.1	<2	11.6	2.9	0.695	23.1

Source: WDI (2000) and Human Development Report, Various Issues

large volatility in agricultural growth, it is very difficult to ensure that oil shock would translate into growth. This will largely depend on future government policy in the areas of public sector restructuring, employment, and investment.

Conclusion

This paper presented a study of the poverty dynamic in Algeria between 1966 and 1995. It argued that roots of poverty in Algeria go back to the days of French colonialism. By the independence in 1962, more than 70 % of the population of Algeria were considered poor. The successive development efforts implemented since the early sixties were aimed at modernizing the economy, spurring growth and redistributing its fruits. This was done by installing a generous social net based on providing goods and services at subsidized prices and allowing free access to health, education and cheap housing rents. The egalitarian program was financed by oil windfalls and external debt. Poverty decreased sharply from 56% in 1966 to 16% in 1988. Most of the social indicators also improved.

This system was very vulnerable to oil price shocks that were amplified by a heavy bureaucratic public sector. In 1986 oil prices declined sharply, causing the collapse of the development model. Per capita expenditure declined as a result of soaring inflation and stringent measures of the IMF led to stabilization and structural adjustment programs. By 1995, poverty was on the increase, up to 23%. The number of poor increased to nearly six million. Growth collapse contributed to this increase more than deterioration of the income distribution. Algeria poverty is mainly caused by growth collapse rather than income distribution deterioration. Government social policy has remained based on free universal access to health, education, and other basic services. Elimination of the food subsidy in the nineties was replaced by a social safety net. Despite the comprehensiveness of this net in terms of coverage, the transfers are thinly distributed and do not permit the alleviation of poverty. However, they contribute to lessen the depth of poverty. The paper demonstrated that strong growth is a good device for the fast reduction in poverty. The big challenge for the Algerian government is using oil windfalls in generating pro poor growth through employment generation and consolidating the social safety net for those unable to work. Based on the future prospects of growth in Algeria up to 2004, it was shown that poverty will be stabilized at around 20% until the end of 2002, and then will decline to 16 %. This simple projection will materialize only if the oil windfalls are used in a pro-poor growth strategy.

However, a more rigorous assessment of the poverty outlook in Algeria, and the evaluation of the impact of the adjustment programs (1995-1998) on poverty could be undertaken only when the new consumer survey data of 2000 is publicly available.

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Appendix