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The Economic Costs of Climate Change in MENA countries: A Micro-Spatial Quantitative Assessment and a Survey of Policies

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The Economic Costs of Climate Change in MENA countries:

A Micro-Spatial Quantitative Assessment and a Survey of Policies

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Directed by Prof. Nicolas Péridy

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Summary

a) **Review of literature and predictions.**

Middle East North Africa (MENA) countries are likely to be highly affected by the negative impacts of climate change and by all means are not immune from its devastating effects. Estimates predict a loss of 0.4 to 1.3% of GDP in MENA countries due to climate change effects, which could even rise to 14% if no mitigation and adaptation measures are undertaken. Because of its geographical position, the MENA region is one of the world's most vulnerable regions to climate change, though with different extents on its countries. According to some studies, the rise in average temperatures and fall in precipitation levels are likely to be larger in MENA than those estimated as a world average. The expected impacts in those countries range from water loss, to soil degradation, to seawater intrusion to sea level rise (SLR). Such impacts are likely to affect all economic activities but with an extremely serious impact on agriculture and tourism, with significant loss in crop yields and an increase in salinization due to the erosion and pollution of soil. Moreover, climate change will negatively affect the ecosystem including marine ecosystems causing biodiversity loss, hence affecting individual species and significantly impacting ecosystems and their related services, on which MENA societies depend.

The 2007 projections by the International Panel on Climate Change (IPCC) for the MENA region predict an increase in temperature up to 2°C in the next 15-20 years and between 4°C and 6.5°C by the end of the 21st century even though its greenhouse gas emissions (GHG) are relatively small compared to the developed countries, yet they have been among the largest producers of fuel combustion emissions in the world. The increase in temperature is likely to be accompanied by a decrease of more than 20% in the level of precipitation. Moreover, MENA countries are among the countries that are considered the world's most water-scarce countries, have high dependency on climate-sensitive agriculture and a large share of their population and economic activity are in flood-prone urban coastal zones. Hence, the expected higher temperatures and reduced precipitation arising from climate change will increase the occurrence of droughts, which will expose additional 80-100 million people in MENA countries to water stress by 2025. In addition, in urban areas in MENA countries, a temperature increase of 1-3 °C could expose around 6–25 million people to coastal flooding. MENA governments are aware of such challenges where, for example, in a joint declaration for the Arab countries it was stated that the governments are aware of such challenges and have been undertaking the necessary adaptation and mitigation measures. Moreover, and following Copenhagen Accord, four MENA countries announced being associated with the Accord, namely Morocco, Jordan, Israel, and Tunisia.

Climate change will have serious effects on agriculture sector and food security in MENA countries resulting in significant loss of crop yields. Moreover, climate change will cause severe problems associated with water management and sea level rise. The negative impact of climate change on agriculture is likely to have further negative consequences on rural-urban migration, which is likely to increase and hence further affects urbanization process, with its associated problems dealing with housing, job opportunities, and investments in infrastructure. Finally, tourism (accounting for 2-12% of GDP in MENA countries) will be negatively affected by climate change through more than one channel including high temperatures, water availability, and prices of international transport.

b) **Statistical evidence of climate change in MENA countries**

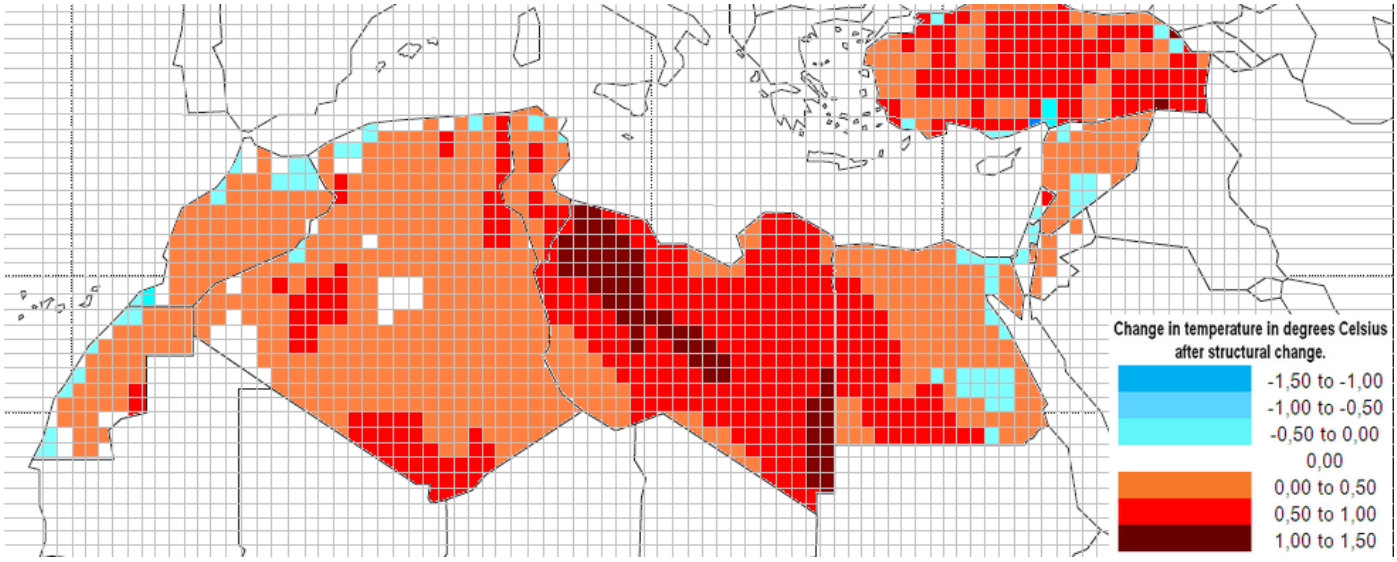
Based on new datasets at micro-spatial level, this research provides a statistical analysis of climate change for 808 MENA geographical areas from the 1900 to 2008. Results show that MENA countries have already experienced a dramatic climate change over the past century, both in terms of temperature increase and fall in precipitation.

Maghreb countries have been more concerned with global warming, which generally occurred from the early 70s. The rise in temperature after this structural change is about +0.3/°0.4 degrees Celsius for these countries. In addition, global warming has accelerated in the early 2000s (+0.9/+1.2° as compared to the period before the structural change). Global warming also concerned Mashrek countries, although to a lesser extent (+0.3/+0.6 °C).

Table 1: Global Warming in MENA Countries (rise in temperature, °C)

	Structural change	Average Temperature (°C): before	2000-2008	Change in temp. (°C)
Algeria	1971	23,1	24,0	+0,9
Egypt	1967	22,0	22,9	+0,9
Israel	1971	19,9	20,2	+0,3
Jordan	1982	19,3	19,7	+0,4
Lebanon	1972	17,3	17,9	+0,6
Libya	1978	22,3	23,3	+1,0
Morocco	1971	19,1	19,6	+0,5
Syria	1971	18,1	18,7	+0,6
Tunisia	1971	20,0	21,2	+1,2
Turkey	1994	12,1	12,5	+0,4

Figure 1: Global Warming after the structural change

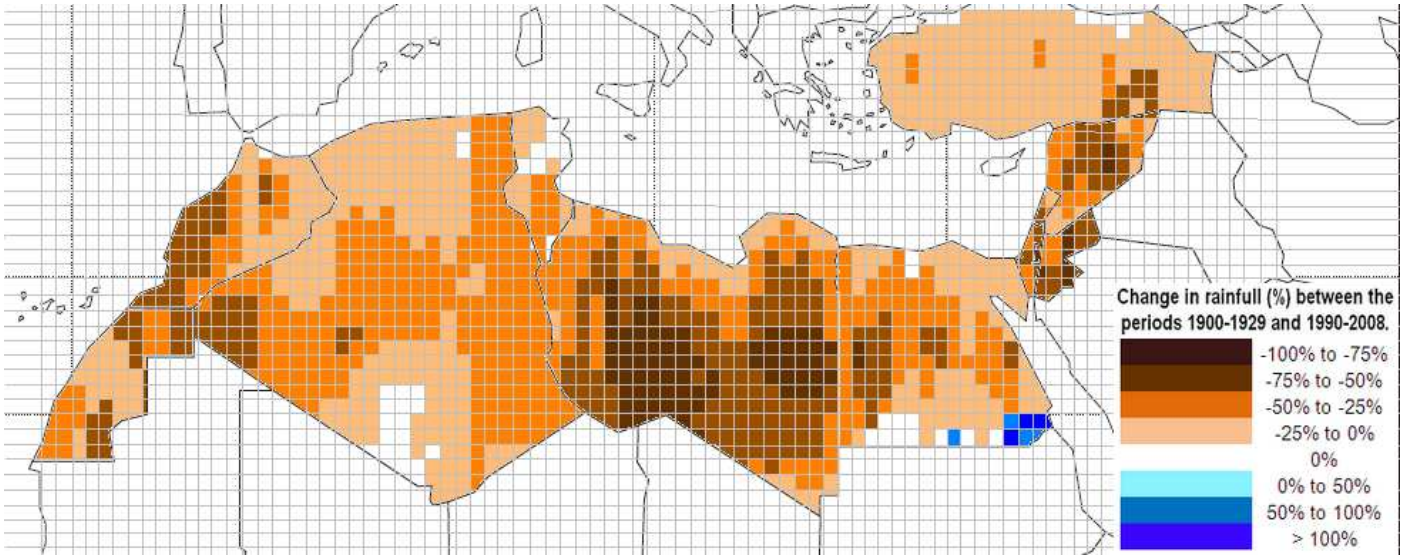


The decrease in rainfalls is also very significant. It mainly concerns Mashrek countries. In addition, this process started earlier than global warming (often before the 1930s). In the most recent period (1990-2008), annual average rainfalls in Mashrek countries and Libya reached only 50% those recorded in the period 1900-1929. Conversely, the reduction in precipitations is much less dramatic in most Maghreb countries and Turkey (-8/-17%).

Table 2: Annual rainfalls for 30 years periods (mm)

	1900-29	1930-59	1960-89	1990-2008	variation (%)
Algeria	108,5	94,2	86,7	89,1	-17,9%
Egypt	36,3	19,5	17,7	33,1	-8,8%
Israel	298,2	195,0	164,5	145,9	-51,1%
Jordan	238,9	149,6	124,9	108,3	-54,7%
Lebanon	1035,0	727,2	654,1	568,0	-45,1%
Libya	85,9	41,1	39,0	43,3	-49,6%
Morocco	215,4	185,3	180,9	186,9	-13,2%
Syria	479,3	364,8	332,9	272,0	-43,3%
Tunisia	242,1	243,5	236,7	241,8	-0,1%
Turkey	606,0	601,5	590,9	570,9	-5,8%

Figure 2: Change in precipitations in the last century (%)



Basically, these results correlate the predictions highlighted by the literature review. As a matter of fact, we have shown that climate change is not only expected in the future, as the literature predicts, but this process has started since the 70s and concern all MENA countries.

c) The impact of climate change in MENA countries' GDP and GDP per capita

Using standard estimators, results show that any increase in temperature by 1°C leads to a decrease in GDP per capita by 8% on average, with a range between 17% in Egypt to 0% in Turkey, Tunisia and some Mashrek countries. This range is very close to results at worldwide level which show that 1°C rise in temperature leads to a decrease in GDP per capita by 8.5% (Dell et al., 2009). However, the impact of the reduction in precipitations on GDP per capita is generally insignificant.

Taking spatial autocorrelation into account, there is still some evidence of a negative impact of temperature on GDP and GDP per capita, especially in North African countries. Interestingly, these countries are those for which global warming has been the most significant (rise in temperature by about 1°C). For the other countries, the impact of temperature on GDP per capita is not significant but these countries are concerned by global warming to a lesser extent (rise in temperature below 0.5°). Overall, the impact of global warming on GDP per capita remains significant. Indeed, a rise in the temperature by 1°C leads to a reduction of GDP per capita by 5% or less, except in Egypt

(15%). However, the impact of the reduction in precipitations on GDP per capita remains generally insignificant.

Results at macro-level make it possible to explain growth in MENA countries with an enlarged set of variables. Results suggest that both temperature and precipitation are significant for explaining growth in these countries. In addition, key variables as education, R&D, infrastructure and communication also strongly influence growth. Finally, the pattern of international trade is detrimental to growth since MENA countries are too much specialized in low value added products which match not enough international demand.

Basically, these results are consistent with the literature review which predicts negative GDP effects of global warming. It has been shown here that these negative effects have already taken place in MENA countries.

d) **Policy options**

There are several initiatives that have been undertaken in MENA countries to deal with climate change. Most of such initiatives have been implemented jointly with donors as the European Commission and the World Bank. In each MENA country, several projects dealing with climate change have been set, signaling that governments are aware of the potential negative consequences of climate change. Yet, such efforts remain insufficient to create large scale, meaningful positive change. There is a need to undertake structural and comprehensive change in governmental policies. Moreover, such changes need to be well coordinated to arrive at positive impacts. Several MENA countries have still not developed their National Adaptation Programs of Action (NAPAs), following the provisions of the United Nations Framework Convention on Climate Change (UNFCCC).

Adaptation measures in MENA countries should focus on simple and low cost adaptation measures building on traditional knowledge, meeting domestic and local conditions and aiming at achieving sustainable developmental goals. Adaptation policies should prioritize their interventions based on the most urgent and vulnerable areas (coastal zones or agriculture sector). Such priorities differ from one country to another. Yet there are general policies that can be adopted in the majority of MENA countries to achieve the required goals.

In addition, MENA countries should focus on reducing CO2 emissions. Low carbon growth can bring significant benefits for MENA economies, including productivity gains in energy use, improved air quality, and reduced traffic congestion. There is a large room for its reduction through energy saving projects. This requires a revisit of the existing energy policies with the introduction of a new comprehensive framework where pricing and efficient targeted subsidies are its main elements. In terms of water management there are a number of adaptation measures that can be implemented including rational usage of water through introducing new pricing systems that count for political economy conditions in several MENA countries. Also there is a need to include systems for reuse of water. The issue of non-conventional measures of water supply as desalinization should be also considered.

For reducing GHG emissions, capacity building initiatives and technology transfer are needed to help MENA countries develop energy efficient systems that minimize global GHG emissions, which take into consideration social aspects to minimize negative impact on the poor. The majority of MENA countries have an outstanding potential for solar energy. In the energy sector, mitigation measures should focus on switching to natural gas, utilization of cleaner fossil fuel systems as clean-coal technologies and nuclear power for energy generation, and encouragement of utilizing renewable energy sources such as wind and solar power.

Hence, and despite the efforts undertaken, the room for further improvement is still wide, including consolidation of efforts, and focus on main priorities where MENA countries could adopt joint work strategies and investment in research and development and capacity building activities.

Policy brief

Middle East North Africa (MENA) countries are likely to be highly affected by the negative impacts of climate change and by all means are not immune from its devastating effects. Estimates predict a loss of 0.4 to 1.3% of GDP in MENA countries due to climate change effects, which could even rise to 14% if no mitigation and adaptation measures are undertaken. Because of its geographical position, the MENA region is one of the world's most vulnerable regions to climate change, though with different extents on its countries. According to some studies, the rise in average temperatures and fall in precipitation levels are likely to be larger in MENA than those estimated as a world average. The expected impacts in those countries range from water loss, to soil degradation, to seawater intrusion to sea level rise (SLR). Such impacts are likely to affect all economic activities but with an extremely serious impact on agriculture and tourism, with significant loss in crop yields and an increase in salinization due to the erosion and pollution of soil. Moreover, climate change will negatively affect the ecosystem including marine ecosystems causing biodiversity loss, hence affecting individual species and significantly impacting ecosystems and their related services, on which MENA societies depend.

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Using standard estimators, this report shows that any increase in temperature by 1°C leads to a decrease in GDP per capita by 8% on average, with a range between 17% in Egypt to 0% in Turkey, Tunisia and some Mashrek countries. This range is very close to results at worldwide level which show that 1°C rise in temperature leads to a decrease in GDP per capita by 8.5% (Dell et al., 2009). However, the impact of the reduction in precipitations on GDP per capita is generally insignificant. Basically, these results still hold by using more specific econometrics (spatial and pane data econometrics

There are several initiatives that have been undertaken in MENA countries to deal with climate change. Most of such initiatives have been implemented jointly with donors as the European Commission and the World Bank. In each MENA country, several projects dealing with climate change have been set, signaling that governments are aware of the potential negative consequences of climate change. Yet, such efforts remain insufficient to create large scale, meaningful positive change. There is a need to undertake structural and comprehensive change in governmental policies. Moreover, such changes need to be well coordinated to arrive at positive impacts. Several MENA countries have still not developed their National Adaptation Programs of Action (NAPAs), following the provisions of the United Nations Framework Convention on Climate Change (UNFCCC).

Adaptation measures in MENA countries should focus on *simple and low cost adaptation measures* building on traditional knowledge, meeting domestic and local conditions and aiming at achieving sustainable developmental goals. Adaptation policies should prioritize their interventions based on the most urgent and vulnerable areas (coastal zones or agriculture sector). Such priorities differ from one country to another depending on the urgency of matters. In other words, climate change is in fact affecting the different aspects of sustainable development in MENA region. Due to the large

number of economic issues and activities it affects (food security, rural urban migration, tourism, etc), a priority list needs to be set by each country. Such priority list should take into consideration two main aspects, namely: urgency of climate change negative impact, and importance of the sector/activity affected. Yet, there are general policies that can be adopted in the majority of MENA countries to achieve the required goals.

In addition, MENA countries should focus on reducing CO2 emissions. Low carbon growth can bring significant benefits for MENA economies, including productivity gains in energy use, improved air quality, and reduced traffic congestion. There is a large room for its reduction through energy saving projects. This requires a *revisit of the existing energy policies* with the introduction of a new comprehensive framework where pricing and efficient targeted subsidies are its main elements. In terms of water management there are a number of adaptation measures that can be implemented including *rational usage of water through introducing new pricing systems* that count for political economy conditions in several MENA countries. Also there is a need to include systems for reuse of water. The issue of non-conventional measures of water supply as desalinization should be also considered.

For reducing GHG emissions, capacity building initiatives and technology transfer are needed to help MENA countries *develop energy efficient systems that minimize global GHG emissions*, which take into consideration social aspects to minimize negative impact on the poor. The majority of MENA countries have an outstanding potential for solar energy. In the energy sector, mitigation measures should focus on switching to natural gas, utilization of cleaner fossil fuel systems as clean-coal technologies and nuclear power for energy generation, and encouragement of utilizing renewable energy sources such as wind and solar power.

Hence, and despite the efforts undertaken, the room for further improvement is still wide, including consolidation of efforts, and focus on main priorities where MENA countries could adopt joint work strategies and investment in research and development and capacity building activities. Shift from mitigation to more adaptation measures should be undertaken. Adoption of further adaptation policies that should be adopted by MENA countries include: 1) policies that aim at disaster reduction and risk management, including early warning, preparedness, emergency response and post-disaster recovery which are still not widely used in MENA countries; 2) national plans that have clear steps for implementation and monitoring regarding specific key areas as water management, agriculture sector, coastal zones, biodiversity and ecosystems, energy saving, urban management, tourism adaptation, while taking into account the cross-sectoral implications; 3)

building economic and social resilience through the diversification of economic activities to reduce vulnerability to climate change.

Résumé

a) **Revue de littérature concernant les prévisions liées au changement climatique**

Les pays d'Afrique du Nord et du Proche Orient (MENA) seront touchés par les effets du changement climatique sur leurs économies. Les estimations disponibles indiquent une baisse attendue du PIB de l'ordre de 0,4% à 1,3%. Cette baisse pourrait même atteindre 14% si aucune mesure de lutte et d'adaptation face au changement climatique n'est adoptée. En raison de leur position géographique, les pays MENA figurent parmi les régions du monde les plus vulnérables, bien que de façon différenciée selon les pays. Ainsi, selon certaines études, la hausse des températures moyennes et la baisse des précipitations risquent d'être plus importantes que la moyenne mondiale. Les effets attendus dans ces pays couvrent la diminution des ressources en eau, la dégradation des sols, l'élévation du niveau de la mer et la pénétration des eaux salées dans les terres, etc. De tels impacts sont susceptibles d'affecter les activités économiques, avec des effets importants sur l'agriculture et le tourisme, suite à la baisse significative des rendements agricoles et à la hausse de la salinisation des terres due à l'érosion et à la pollution des sols par le sel. De plus, le changement climatique aura des effets négatifs sur les écosystèmes provoquant ainsi la diminution de la biodiversité qui affectera les espèces individuelles, les écosystèmes et les services associés dans les pays MENA.

Les prévisions effectuées en 2007 par le Groupe International sur le Changement Climatique (IPCC) indiquent une hausse de la température de l'ordre de 2°C dans les 15 à 20 prochaines années, et jusqu'à 4 à 6,5°C à la fin du 21^{e} siècle. Même si les émissions de gaz à effets de serre (GES) sont limitées dans les pays MENA par rapport aux pays développés, ces pays figurent parmi les plus gros producteurs de pétrole qui rejettent du CO2. Par ailleurs, l'augmentation de la température moyenne devrait s'accompagner d'une baisse d'au moins 20% des précipitations dans les pays MENA. Cette situation est inquiétante dans la mesure où ces pays figurent parmi les pays du monde disposant des plus faibles ressources en eau, ce qui les rend climatiquement dépendants de l'agriculture ainsi que d'une population et d'activités économiques concentrées en zones côtières inondables. Ainsi, la hausse des températures et la baisse des précipitations attendues risquent d'augmenter la fréquence des sécheresses, ce qui va exposer de 80 à 100 millions de personnes en zones d'insuffisance en eau à l'horizon 2025. De plus, en zone urbaine, une hausse des températures de 1 à 3°C pourrait exposer entre 6 et 25 millions de personnes aux inondations côtières. Les gouvernements des pays MENA sont conscients de ces défis à travers la déclaration

des pays arabes reconnaissant l'utilité des mesures de prévention et d'adaptation au changement climatique. En outre, suite aux accords de Copenhague, quatre pays MENA ont annoncé qu'ils s'associaient à ces accords. Il s'agit du Maroc, de la Jordanie, d'Israël et de la Tunisie.

Au niveau sectoriel, le changement climatique aura des effets importants sur l'agriculture et la sécurité alimentaire des pays MENA, suite à la baisse significative des rendements. De plus, les dérèglements climatiques vont causer de sérieux problèmes liés à la gestion de l'eau et à la hausse du niveau de la mer. L'impact négatif sur l'agriculture est supposé avoir des conséquences sur l'exode rural, ce qui accélérera les processus d'urbanisation avec les problèmes associés comme le logement, l'emploi et les investissements en infrastructures. Enfin, le tourisme, qui représente entre 2 et 12% du PIB selon les pays, sera négativement impacté à partir de plusieurs canaux tels l'élévation de la température, les disponibilités en eau et les prix du transport international.

b) **Evidence statistique du changement climatique dans les pays MENA**

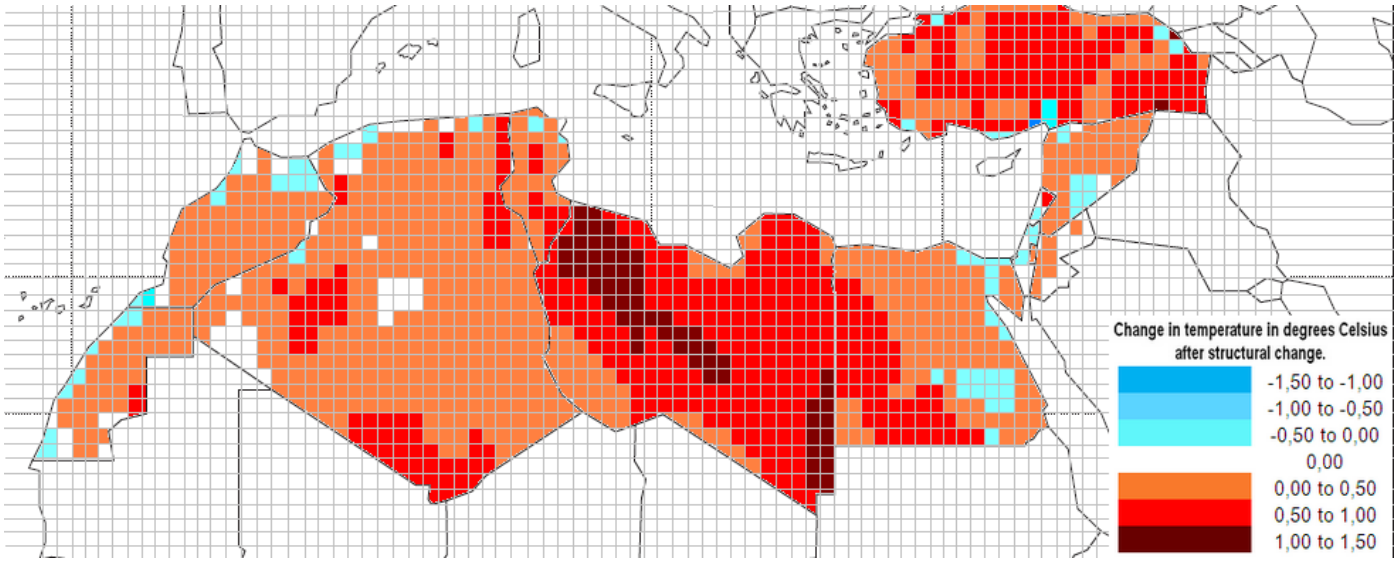
A partir de nouvelles bases de données au niveau micro-spatial, ce rapport permet une analyse statistique du changement climatique pour 808 régions des pays MENA de 1900 à 2008. Les résultats montrent que le changement climatique dans les pays MENA a déjà débuté, tant en termes de hausse de température que de baisse de précipitations.

Les pays du Maghreb sont les plus concernés par le réchauffement climatique, qui a généralement débuté dans les années 70. La hausse des températures après ce changement structurel s'élève à +0,3-0,4°C. Ce réchauffement s'est accéléré depuis le début des années 2000 (+0,9/+1,2°C par rapport à la période précédent le changement structurel). Durant cette période, le réchauffement climatique concerne également les pays du Mashrek, bien qu'à un degré moindre (+0.3/+0.6 °C).

Tableau 1: Le réchauffement climatique dans les pays MENA (hausse de la température, °C)

	Changement structurel	Température moyenne		var. température
		Avant	2000-2008	(°C)
Algérie	1971	23,1	24,0	+0,9
Egypte	1967	22,0	22,9	+0,9
Israel	1971	19,9	20,2	+0,3
Jordanie	1982	19,3	19,7	+0,4
Liban	1972	17,3	17,9	+0,6
Libye	1978	22,3	23,3	+1,0
Maroc	1971	19,1	19,6	+0,5
Syrie	1971	18,1	18,7	+0,6
Tunisie	1971	20,0	21,2	+1,2
Turquie	1994	12,1	12,5	+0,4

Figure 1: Réchauffement climatique après le changement structurel



La baisse des précipitations est également très significative. Elle concerne principalement les pays du Mashrek. De plus, ce processus a commencé plus tôt que le réchauffement climatique (souvent avant les années 30). Au cours de la période la plus récente (1990-2008), les précipitations moyennes annuelles du Mashrek et de la Libye ont atteint seulement 50% du niveau enregistré au début du 20^{e} siècle (1900-1929). En revanche, la baisse des précipitations est moins accentuée au Maghreb et en Turquie (de -8% à -17% sur la même période).

Table 2: Moyenne des précipitations par période de 30 ans (mm)

	1900-29	1930-59	1960-89	1990-2008	variation (%)
Algérie	108,5	94,2	86,7	89,1	-17,9%
Egypte	36,3	19,5	17,7	33,1	-8,8%
Israel	298,2	195,0	164,5	145,9	-51,1%
Jordanie	238,9	149,6	124,9	108,3	-54,7%
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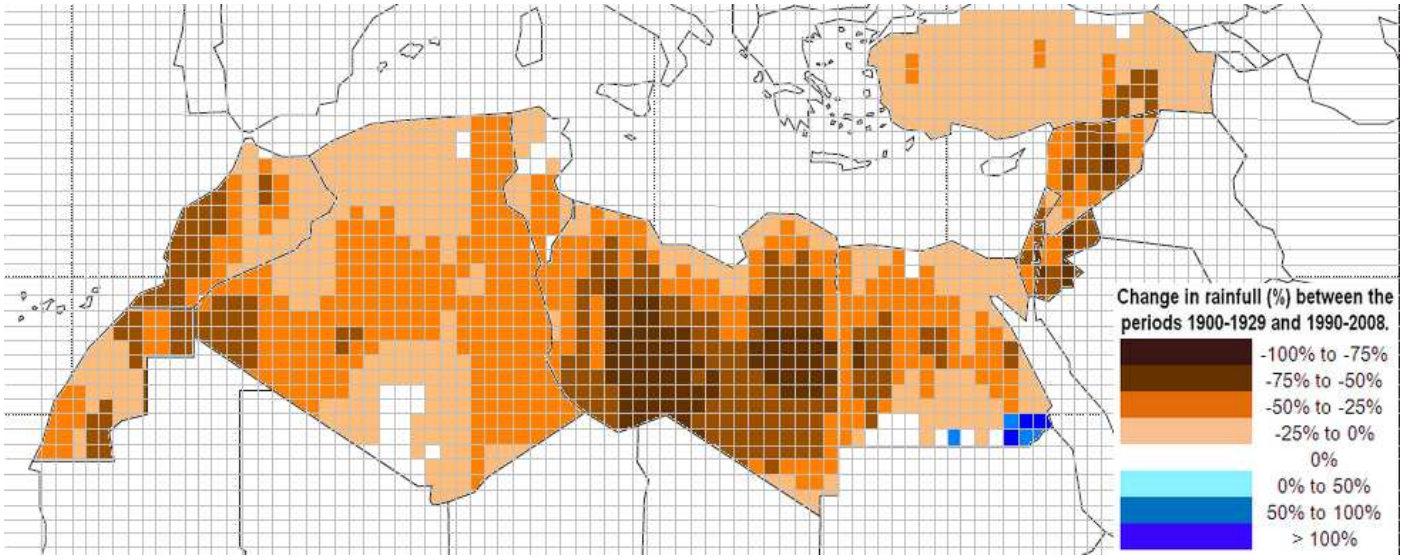
Tunisie	242,1	243,5	236,7	241,8	-0,1%
Turquie	606,0	601,5	590,9	570,9	-5,8%

Figure 2: Variation des précipitations depuis le début du 20e siècle



Dans l'ensemble, ces résultats sont conformes aux prévisions mises en évidence par la revue de littérature. En effet, nous avons démontré que le changement climatique n'est pas seulement prévu dans le futur, comme l'indique la littérature, mais ce processus a déjà démarré au moins depuis les années 70 et concerne tous les pays MENA.

c) **L’impact du changement climatique sur le PIB et le PIB par habitant des pays MENA.**

Nos premières estimations indiquent qu’une hausse de 1°C des températures provoque une baisse du PIB par habitant de l’ordre de 8% en moyenne, avec une fourchette variant de -17% pour l’Egypte à 0% pour la Turquie, la Tunisie et certains pays du Mashrek. Cette fourchette est proche de la moyenne mondiale, qui est de l’ordre de -8,5% pour une hausse de 1°C de la température (Dell et al. 2009). Cependant, l’impact de la réduction des précipitations sur le PIB n’est pas significatif.

En tenant compte de l’autocorrélation spatiale des résidus, l’impact du réchauffement climatique est toujours significatif, surtout en Afrique du Nord. Ces pays sont d’ailleurs ceux pour lesquels le réchauffement climatique est le plus significatif, puisque la hausse des températures atteint déjà 1°C depuis les années 70. Pour les autres pays, l’impact de la hausse de la température sur le PIB par habitant est moins significatif. Il est vrai que ces pays sont également moins touchés par le réchauffement puisque la température dans ces pays n’a augmenté que de 0,5°C. Dans l’ensemble, l’impact du réchauffement climatique sur le PIB par habitant est généralement inférieur à 5%, sauf pour l’Egypte (15%). Quant à l’impact de la baisse des précipitations, il reste généralement non significatif.

L’analyse au niveau macro-spatial (c'est-à-dire au niveau des pays dans leur ensemble) permet d’expliquer la croissance dans les pays MENA avec un nombre élargi de variables explicatives. Les résultats indiquent que la température et les précipitations sont deux variables significatives qui expliquent la croissance dans les pays MENA. De plus, d’autres variables clé comme l’éducation, la R&D, les infrastructures et les communications influencent également la croissance de façon significative. Enfin, certaines variables liées au commerce international peuvent avoir une influence négative sur la croissance, notamment car les pays MENA sont trop spécialisés dans des produits à faible valeur ajoutée qui ne « collent » pas suffisamment à la demande internationale.

Dans l’ensemble, ces résultats sont cohérents avec la revue de littérature qui prédit des effets négatifs du changement climatique sur le PIB. Ce rapport montre que ces effets ont déjà commencé à se manifester dans les pays MENA.

d) **Options de politique économique**

Il existe plusieurs initiatives entreprises par les pays MENA dans le domaine du changement climatique. La plupart ont été mises en œuvre conjointement avec les donateurs tels que la Commission Européenne et la Banque Mondiale. Dans chaque pays, plusieurs projets ont été mis en place, ce qui indique la préoccupation des gouvernements face aux changements climatiques et leurs conséquences. Toutefois, ces efforts restent insuffisants pour créer à une échelle importante, des changements positifs significatifs. Il existe un réel besoin de changements structurels et d'envergure des politiques gouvernementales. De plus, de tels changements doivent impérativement être coordonnés. Par exemple, plusieurs pays MENA ont développé des programmes d'actions nationaux d'adaptation (NAPA), faisant suite aux directives de la convention des Nations Unies sur le changement climatique (UNFCCC).

Les mesures d'adaptation adoptées dans les pays MENA devraient être centrées sur des plans simples et à bas coût s'appuyant sur les connaissances traditionnelles, remplissant les conditions locales et visant à atteindre des objectifs de développement durable. Les politiques d'adaptation doivent donner des priorités aux interventions qui prennent en compte les caractères d'urgence et de vulnérabilité dans les zones concernées (zones côtières ou secteur agricole). De telles priorités diffèrent d'un pays à l'autre. Cependant, il existe aussi des politiques générales pouvant être adoptées dans la majorité des pays MENA pour atteindre les objectifs voulus.

De plus, les pays MENA doivent concentrer leurs efforts sur la réduction des émissions de CO2. En effet, une telle diminution pourrait profiter aux économies de ces pays, en augmentant les gains de productivité dans l'utilisation d'énergie, en améliorant la qualité de l'air et en réduisant les embouteillages. Il existe un vaste espace pour de telles réductions à travers des projets d'économie d'énergie. Ceci nécessite de revisiter les politiques énergétiques existantes avec l'introduction de nouveaux schémas d'envergure et un système de prix et de subventions incitatifs. En termes de gestion de l'eau, un grand nombre de mesures d'adaptation peuvent être mises en œuvre à partir d'un usage rationnel de l'eau basé sur de nouveaux systèmes de prix et de recyclage de l'eau. Enfin, des mesures liées à de nouvelles sources d'approvisionnement, comme la désalinisation, doivent aussi être considérées.

Afin de réduite les GES, des initiatives de renforcement de capacité et de transfert de technologie sont nécessaires afin de développer des systèmes d'énergie efficients pour minimiser les émissions de GES tout en prenant en compte les aspects sociaux permettant de limiter les impacts négatifs sur les populations les plus pauvres. Par exemple, la plupart des pays MENA ont un énorme potentiel pour les énergies solaires. D'une manière plus générale, les mesures énergétiques devraient se concentrer sur une réorientation vers le gaz naturel, les systèmes énergétiques fossiles plus propres et éventuellement l'énergie nucléaire en plus des sources d'énergie renouvelables (éoliennes et solaires). Cependant, et en dépit des récents efforts entrepris, il reste beaucoup de place pour les améliorations futures, en matière notamment de définition de priorités nécessitant des programmes stratégiques conjoints, de la recherche et de l'investissement.

Implications en termes de politiques économiques

Les pays d'Afrique du Nord et du Proche Orient (MENA) seront potentiellement touchés par les effets du changement climatique sur leurs économies. Les estimations disponibles indiquent une baisse attendue du PIB de l'ordre de 0,4% à 1,3%. Cette baisse pourrait même atteindre 14% si aucune mesure de lutte et d'adaptation face au changement climatique n'est adoptée. En raison de leur position géographique, les pays MENA figurent parmi les régions du monde les plus vulnérables, bien que de façon différenciée selon les pays. Ainsi, selon certaines études, la hausse des températures moyennes et la baisse des précipitations risquent d'être plus importantes que la moyenne mondiale. Les effets attendus dans ces pays couvrent la diminution des ressources en eau, la dégradation des sols, l'élévation du niveau de la mer et la pénétration des eaux salées dans les terres, etc. De tels impacts sont susceptibles d'affecter les activités économiques, avec des effets importants sur l'agriculture et le tourisme, suite à la baisse significative des rendements agricoles et à la hausse de la salinisation des terres due à l'érosion et à la pollution des sols par le sel. De plus, le changement climatique aura des effets négatifs sur les écosystèmes provoquant ainsi la diminution de la biodiversité qui affectera les espèces individuelles, les écosystèmes et les services associés dans les pays MENA.

Les prévisions effectuées en 2007 par le Groupe International sur le Changement Climatique (IPCC) indiquent une hausse de la température de l'ordre de 2°C dans les 15 à 20 prochaines années, et jusqu'à 4 à 6,5°C à la fin du 21^{e} siècle. Même si les émissions de gaz à effets de serre (GES) sont limitées dans les pays MENA par rapport aux pays développés, ces pays figurent parmi les plus gros producteurs de pétrole qui rejettent du CO2. Par ailleurs, l'augmentation de la température moyenne devrait s'accompagner d'une baisse d'au moins 20% des précipitations dans les pays MENA. Cette situation est inquiétante dans la mesure où ces pays figurent parmi les pays du monde disposant des plus faibles ressources en eau, ce qui les rend climatiquement dépendants de l'agriculture ainsi que d'une population et d'activités économiques concentrées en zones côtières inondables. Ainsi, la hausse des températures et la baisse des précipitations attendues risquent d'augmenter la fréquence des sécheresses, ce qui va exposer de 80 à 100 millions de personnes en zones d'insuffisance en eau à l'horizon 2025. De plus, en zone urbaine, une hausse des températures de 1 à 3°C pourrait exposer entre 6 et 25 millions de personnes aux inondations côtières. Les gouvernements des pays MENA sont conscients de ces défis à travers la déclaration des pays arabes reconnaissant l'utilité des mesures de prévention et d'adaptation au changement

climatique. En outre, suite aux accords de Copenhague, quatre pays MENA ont annoncé qu'ils s'associaient à ces accords. Il s'agit du Maroc, de la Jordanie, d'Israël et de la Tunisie.

Au niveau sectoriel, le changement climatique aura des effets importants sur l'agriculture et la sécurité alimentaire des pays MENA, suite à la baisse significative des rendements. De plus, les dérèglements climatiques vont causer de sérieux problèmes liés à la gestion de l'eau et à la hausse du niveau de la mer. L'impact négatif sur l'agriculture est supposé avoir des conséquences sur l'exode rural, ce qui accélérera les processus d'urbanisation avec les problèmes associés comme le logement, l'emploi et les investissements en infrastructures. Enfin, le tourisme, qui représente entre 2 et 12% du PIB selon les pays, sera négativement impacté à partir de plusieurs canaux tels l'élévation de la température, les disponibilités en eau et les prix du transport international.

Nos premières estimations indiquent qu'une hausse de 1°C des températures provoque une baisse du PIB par habitant de l'ordre de 8% en moyenne, avec une fourchette variant de -17% pour l'Egypte à 0% pour la Turquie, la Tunisie et certains pays du Mashrek. Cette fourchette est proche de la moyenne mondiale, qui est de l'ordre de -8,5% pour une hausse de 1°C de la température (Dell et al. 2009). Cependant, l'impact de la réduction des précipitations sur le PIB n'est pas significatif. Ces estimations sont confirmées en utilisant des méthodes économétriques plus spécifiques (économétrie spatiale et en données de panel).

Il existe plusieurs initiatives entreprises par les pays MENA dans le domaine du changement climatique. La plupart ont été mises en œuvre conjointement avec les donateurs tels que la Commission Européenne et la Banque Mondiale. Dans chaque pays, plusieurs projets ont été mis en place, ce qui indique la préoccupation des gouvernements face aux changements climatiques et leurs conséquences. Toutefois, ces efforts restent insuffisants pour créer à une échelle importante, des changements positifs significatifs. Il existe un réel besoin de changements structurels et d'envergure des politiques gouvernementales. De plus, de tels changements doivent impérativement être coordonnés. Par exemple, plusieurs pays MENA ont développé des programmes d'actions nationaux d'adaptation (NAPA), faisant suite aux directives de la convention des Nations Unies sur le changement climatique (UNFCCC).

Les mesures adoptées dans les pays MENA devraient être centrées sur des plans d'adaptation simples et à bas coût s'appuyant sur les connaissances traditionnelles, remplissant les conditions locales et visant à atteindre des objectifs de développement durable. Les politiques d'adaptation

doivent donner des priorités aux interventions qui prennent en compte les caractères d'urgence et de vulnérabilité dans les zones concernées (zones côtières ou secteur agricole). De telles priorités diffèrent d'un pays à l'autre en fonction de leur caractère d'urgence. En d'autres termes, le changement climatique affecte différents aspects du développement durable. En raison du grand nombre d'activités qu'il affecte (sécurité alimentaire, exode rural, tourisme, etc.), une liste de priorités doit être dressée pour chaque pays. Cette liste doit prendre en considération deux aspects : l'urgence liée aux effets négatifs du changement climatique et l'importance du secteur concerné. Cependant, il existe aussi des politiques générales pouvant être adoptées dans la majorité des pays MENA pour atteindre les objectifs voulus.

De plus, les pays MENA doivent concentrer leurs efforts sur la réduction des émissions de CO2. En effet, une telle diminution pourrait profiter aux économies de ces pays, en augmentant les gains de productivité dans l'utilisation d'énergie, en améliorant la qualité de l'air et en réduisant les embouteillages. Il existe un vaste espace pour de telles réductions à travers des projets d'économie d'énergie. Ceci nécessite de revisiter les politiques énergétiques existantes avec l'introduction de nouveaux schémas d'envergure et un système de prix et de subventions incitatifs. En termes de gestion de l'eau, un grand nombre de mesures d'adaptation peuvent être mises en œuvre à partir d'un usage rationnel de l'eau basé sur de nouveaux systèmes de prix et de recyclage de l'eau. Enfin, des mesures liées à de nouvelles sources d'approvisionnement, comme la désalinisation, doivent aussi être considérées.

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l’eau, le secteur agricole, les zones côtières, la biodiversité et les écosystèmes, les économies d’énergie, la gestion urbaine, l’adaptation touristique, en tenant en compte des interrelations entre ces secteurs ; iii) construire un système de résistance à travers la diversification des activités économiques afin de réduire la vulnérabilité aux changements climatiques.

Introduction

Climate change, especially global warming has recently become a major issue for the world population and thus policy makers. Most scientific studies estimated global warming to range between 1.0°C to 4.5°C by the end of this century (IPPC (2007). In the recent World Summit on global warming in Durban (2011), most experts updated this range between +2°C and +6°C. These estimates raise many questions about the economic impact of such a rise in average temperatures. In this regard, a new literature has very recently emerged in order to address these questions (Stern, 2008, Dell and al., 2009, Pindyck, 2010). This burgeoning literature has paved the way toward a better understanding about theory and channels which link climate change to economics. In particular, global warming is expected to negatively impact income and growth. Moreover, some new spatial datasets have recently been developed at a detailed geographical level concerning climate (Matsuura and Willmott 2009) and economic activity (Nordhaus, 2006).

Basically, there are currently three main methods for investigating the economic impact of climate changes. The first is emphasized in the growth and development literature (Nordhaus, 2006, Gallup and al., 1998). It relates average temperature to aggregate economic variables in cross-section of countries. This approach is criticized on several aspects: first, it disregards the time component of the relationship. By disregarding dynamics, this considerably limits the analysis of the impact of temperature on economic variables (especially the impact of global warming). Second, some authors argue that this correlation is driven by spurious associations of climate with national characteristics, such as governance, etc… (Rodrik and al., 2004). A final drawback of this approach is due to the data aggregation at country level. In other words, the micro-spatial dimension within countries is disregarded. This drawback is significant since a single country includes many regions with different income and climate characteristics.

The second approach relies on micro-evidence to quantify various climatic effects and then aggregates them to produce a net effect on national income. It is generally referred to as Integrated Assessement Models (IAM). This approach is more precise than the previous one, in the sense that it includes many channels by which climate affects economy (productivity, mortality, crime, physical performance, etc…). However, these models lead to considerable complexity which requires drastic simplification at all stages (Stern, 2008).

A third approach focuses on the climate-income relationship by introducing time and within country (regional) spatial dimensions. The introduction of the time dimension makes it possible to calculate the impact of a 1°C elevation in temperature on GDP in each country (and not across countries). This provides a much more precise idea about the particular effect of global warming in a given

country. Finally, considering the spatial dimension within countries provides much more precise insights in explaining income and growth. This advantage is also put forward in new growth models (Acemoglu et al., 2009).

The results of this burgeoning literature show that a 1°C elevation in temperature reduces both income and growth. For example, (Dell and al. 2009) shows that income and growth are respectively reduced by about 8.5% and 1% respectively. Using a different method and country sample, Nordhaus (2006) shows that global warming is expected to reduce income up to 4%.

MENA countries are particularly concerned with global warming because their geographic location (close to deserts) makes them particularly sensitive to temperature elevation and rainfall decline. In this regard, it is worth mentioning that the emerging literature has still yet not be applied to the quantitative assessment of climate change in MENA countries. The present study aims to fill this lack of literature by proposing the implementation of the third approach to test the effects of climate change on MENA countries' economies (refer to research methodology for details).

For that purpose, this research study will include three parts. The first part of this study will be devoted to a detailed the review of literature concerning stylized facts of climate change and its effects in MENA countries. In particular, it will provide special insights into i) the status of climate change in relationship to MENA countries; ii) the impact of climate change on specific issues (food security, agriculture, water management, migration, tourism, and urbanization).

The second part of the study will focus on a quantitative analysis of climate change and its economics effects in MENA countries. The first question to be addressed is to know to what extent climate change has already started in MENA countries. The answer to this question will rely on the use on a new dataset at micro-spatial level, i.e. the Terrestrial Air Temperature and Precipitation (TATP) (1900-2008) (version 1.02, 2009) compiled by Matsuura and Willmott in conjunction with NASA[1]. It provides data for each 1 degree latitude/longitude grid, i.e. 808 micro areas in MENA countries. This dataset will then be used to graph and map yearly temperature and rainfall over the past decades, in order to identify possible trends. These trends will provide a first insight into climate change for each micro area. Then, statistical tests will be implemented in order to identify structural changes and quantify the rise in temperature and the decrease in rainfalls since the structural change in each country and each micro area.

[1] http:/climate.geog.udel.edu/~climate/html_pages/doawnload.html.

The second section will be dedicated to test the climate/growth relationship. In this regard, an econometric model will be implemented at alternative levels (country and micro areas). This means that we need income and climate data at each level. As shown previously, climate data will be available for each level with TATP (2007). Similarly, the G-Econ database provides macroeconomic data (especially income) for each geographic cell corresponding to 1° latitude and 1° longitude. Once the dataset has been completed, the econometric relationship between income (or alternatively growth and income per capita) and climate change (temperature and precipitation) will be tested in order to calculate the effects of a rise in the temperature by 1°C on income in MENA countries. In this regards, panel data econometrics will be used together with spatial econometrics. Comparing our results with those calculated for other countries will help understanding to what extent MENA countries are sensitive to global warming relative to other countries.

The final part focuses on policy aspects. It includes i) the policies adopted by MENA countries to overcome climate change and ii) other policy aspects and the role of the EU in this regard. It shows that despite the efforts undertaken, the room for further improvement is still wide, including consolidation of efforts, and focus on main priorities where MENA countries could adopt joint work strategies and investment in research and development and capacity building activities.

Part One: Climate Change in MENA countries: A Review of Literature[2]

This part proposes a detailed the review of literature concerning stylized facts as well as policy aspects of climate change and its effects in MENA countries. In particular, it will provide special insights on i) the status of climate change in relationship to MENA countries; ii) the impact of climate change on specific issues (food security, agriculture, water management, migration, tourism, and urbanization).

Section One: Status of Climate Change in Relationship to Middle East North Africa Countries[3]: A review of literature.

Climate change effects on developing countries are devastating. The effects operate through many channels reducing industrial output, agricultural output and productivity, and causing water shortages, and sea level rise (SLR). Such effects are likely to reduce rates of growth as well as level of outputs in developing countries (Benjamin et. al, 2008). However, there are considerable uncertainties over costs and benefits of abatement, hence making cost benefit analysis based on the expected values extremely challenging for both developing and developed countries, especially that the probability distributions for future temperatures and impacts are unknown (Pindyck, 2010). Such element of uncertainty on the current and potential costs and benefits maybe is the most important cause of lack of agreement on how to deal with climate change as has been recently experienced in Durbin, and before in Bonn over the Kyoto protocol. Yet, what is certain is that the costs for developing countries are expected to be huge. As put by World Bank (2010a), "total climate finance for developing countries is $10 billion a year today, compared with projected annual requirements by 2030 of $30 to $100 billion for adaptation and $140 to $175 billion (with associated financing requirements of $265 to $565 billion) for mitigation".

Middle East North Africa (MENA) countries are not immune from such devastating effects of climate change and in fact are highly prone to the negative impact of climate change. As a result of its geographical position MENA region is one of the world's most vulnerable regions to climate

[2] This part was written by Ahmed F. Ghoneim with the assistance of Heba El Deken, and data collection of Yasmin Ahmed.

[3] MENA countries tackled in this study include Algeria, Egypt, Israel, Jordan, Lebanon, Libya Morocco, Syria, Tunisia, and Turkey.

change, though with different extents (Sowers and Weinthal, 2010). According to some studies the rise in average temperatures and fall in precipitation levels are likely to be larger than those estimated as a world average (World Bank, 2011; Mombiela, 2010). The expected impacts in those countries range from water loss, to soil degradation, to seawater intrusion to SLR (Nasr, 2009). Such impacts are likely to affect all economic activities but with an extremely serious impact on agriculture and tourism, with significant loss in crop yields (Giannakopoulos et. al, 2005) and an increase in salinization due to the erosion and pollution of soil (Mombiela, 2010). Moreover, climate change will negatively affect the ecosystem including marine ecosystems causing biodiversity loss, hence affecting individual species and significantly impacting ecosystems and their related services, on which MENA societies depend (European Commission, 2009).

The 2007 projections by the International Panel on Climate Change (IPCC) for the MENA region predict an increase in temperature up to 2°C in the next 15-20 years and between 4°C and 6.5°C by the end of the 21st century even though its greenhouse gas emissions (GHG) are relatively small compared to the developed countries, yet they have been among the largest producers of fuel combustion emissions in the world (World Bank, 2007). The increase in temperature is likely to be accompanied by a decrease of more than 20% in the level of precipitation. Such climate changes will result in shorter and warmer winters, dryer and hotter summers, and more variability and extreme weather events occurrence (World Bank, 2010a). MENA countries are among the countries that are considered the world's most water-scarce countries, have high dependency on climate-sensitive agriculture and a large share of their population and economic activity are in flood-prone urban coastal zones (World Bank, 2010a; OSS and UNEP, 2010). The expected higher temperatures and reduced precipitation arising from climate change will increase the occurrence of droughts, which will expose additional 80-100 million people in those countries to water stress by 2025 (World Bank, 2010a). Moreover, in urban areas in MENA countries, a temperature increase of 1-3 °C could expose around 6–25 million people to coastal flooding. Such changes are likely to cause extremely high water stress in countries where per capita renewable fresh water in the region fell from 4000 m3 per year in 1950 to 1100 m3 in 2011 (Muholland, 2011). Water loss is expected to be between 30-50% by 2050 (Barghouti, 2009). Moreover, MENA countries suffer from increasing frequency of dust storms which induce soil loss, reduction in perception rate and agricultural productivity, and dramatic reduction of air quality (Ghoneim, 2009).

The IPCC also predicts sea levels rising from 0.1 to 0.3 meters by 2050, and from 0.1 to 0.9 meters by 2100, with significant and maybe higher impacts on MENA countries due to the low-lying coastal areas in countries as Egypt, Morocco, Algeria, Tunisia, and Libya. Hence, the impact of the

SLR is not uniform across MENA countries, where it is highly evident in the aforementioned MENA countries, and less on others (Ghoneim, 2009). For example, Egypt is considered one of the top five countries in the world expected to be mostly impacted with a 1-m SLR[4]. The low lying coastal areas in Egypt (but as well in Tunisia, and Libya) put MENA countries at a significant risk (World Bank, 2010a). The SLR has several negative implications on agriculture and rural-urban migration through its effect on the vulnerable areas on the Nile Delta coast (Elsharkawy et. al, 2009). As argued by the World Bank (2010b), the social, economic, ecological, and hence political impacts of climate change for MENA countries are expected to be relatively severe when compared to other county groupings in the world. Moreover, the costs associated with environmental damages (largely attributed to climate change) are high varying according to World Bank estimates between 4 and 9% of GDP in MENA countries compared to 5% in Eastern Europe and 2-3% in OECD countries (ac cited in Chemingui, 2001). To be more specific, the annual cost of air pollution ranges between 0.9 to 1.35% of GDP in MENA countries, whereas annual cost of land degradation ranges between 1.1 to 1.6%, and water, sanitation and hygiene ranges between 0.65 to 6.5% of GDP (Larsen, 2010). MENA governments are aware of such challenges where in a joint deceleration for the Arab countries it was stated that "the Arab region located within the dry and arid regions will be one of most vulnerable regions to the potential impacts of climate change from the threat to coastal zones to the increased intensity of drought and desertification, the harsh scarcity of water resources, along with the increase in the salinity of groundwater, and the spread of pests epidemics and diseases in an unprecedented manner" (League of Arab States, 2007). Moreover, and following Copenhagen Accord, four MENA countries announced being associated with the Accord, namely Morocco, Jordan, Israel, and Tunisia. For example, and following the nationally appropriate mitigation action (NAMA), Israel announced a percentage reduction of national emission below base year in 2020, whereas Morocco and Jordan submitted specific projects.

WADImena (2008) predicts that MENA countries are expected to have losses of 0.4 to 1.3% of GDP due to climate change impacts, and if no adaptation measures are undertaken, the associated losses could be up to 14% GDP. Those are considerable losses, which certainly require fast actions. The majority of MENA countries have ratified the Kyoto Protocol and hence they were not committed to quantified limits on their emissions between 2008 and 2012. Yet, the annual emissions in MENA countries have been increasing significantly in the last few years (Booz&Co, 2006) (see table 1).

[4] Global models predict sea levels rising from about 0.1 to 0.3 meters by the year 2050 and from about 0.1 to 0.9 meters by 2100 (see World Bank, 2010a).

Table (1): GHG Emissions in MENA Countries

	CO_2 emissions (KT)			CO_2 emissions (metric tons per capita)			Other GHG emissions, HFC, PFC, SF6 (thousand metric tons of CO_2 equivalent)		
Country	1990	2000	2008	1990	2000	2008	1990	2000	2005
Algeria	78,896	87,931	111,304	3.1	2.9	3.2	326	372	489
Egypt	75,944	141,326	210,321	1.3	2.1	2.7	2,059	2,570	3,181
Iran	227,185	339,242	538,404	4.1	5.2	7.4	2,647	1,863	2,569
Israel	33,535	62,691	37,664	7.2	10.0	5.2	1,049	1,788	1,981
Jordan	10,403	15,508	21,382	3.3	3.2	3.7	-	20	112
Lebanon	9,098	15,354	17,099	3.1	4.1	4.1	-	-	-
Libya	40,319	49,754	58,331	9.3	9.5	9.5	282	178	280
Morocco	23,542	33,905	47,906	1.0	1.2	1.5	-	-	-
Syria	37,451	63,589	71,598	3.0	4.0	3.6	-	-	-
Tunisia	13,267	19,923	25,013	1.6	2.1	2.4	-	-	-
Turkey	150,791	216,148	283,980	2.8	3.4	4.0	2,573	2,539	5,066

Source: World Development indicators, World Bank.

In the case of Egypt, there has been a trend of increased average temperature which is expected to increase further in the future by an average of 1.4 °C and 2.5°C projected by 2050 and 2100. Such high temperatures are expected to decrease water availability from the Nile. The serious coastal zone and decline in water resources impact are expected to have serious negative impacts on agriculture due to salinization (Agrawala et. al, 2004).

In the case of Northern Africa, namely, Algeria, Tunisia, and Morocco, available studies show that this region is highly vulnerable to climate change where the last thirty years experienced a marked increase in the frequency of droughts and floods, despite the fact that Morocco emits low levels of GHG (between 1.5 and 3.5 emission tones of CO2/inhabitant/year) Such vulnerability put water resources under huge strains and two of their major economic activities under real threat, namely agriculture and tourism (Agoumi, 2003). Climate projections on Morocco show gradual increasing aridity because of reduced rainfall and higher temperatures. In general some studies predict that reduction in perception rate is likely to be higher in Morocco when compared to other MENA countries reaching 30-40% by 2050 as compared to 10.5% on average for rest of MENA countries (Barghouti, 2009). This means that if aridity increases, on average, as predicted, there can nonetheless be certain years, sporadically, that will be very rainy. Increased aridity will thus have negative effects on agricultural yields, especially from 2030 onwards. The expected increase in temperature is between 0.6 and 1.1° C by 2020, and annual rainfall is expected to drop on average by 4% as compared with the figures for 2000. Moreover, the potential impact of climate change on water resources in 2020 would be an average reduction of 10-15% and on agriculture a fall in cereal output of around 50% in a dry year and 10% in a normal year (World Bank, 2010b). Other studies have shown that the impact of climate change in Morocco differs by region and product where some crops are highly vulnerable to climate change as well as specific agro-ecological zones

(World Bank, 2009). In other words, not only MENA countries are affected differently by climate changes, but as well, the regions within MENA countries are affected differently.

In the case of Jordan, Hamdi et al (2009) attempted to investigate whether there has been any evidence associated with climate change in several meteorological stations in Jordan, namely Irbid City, Baqoura, Dir Alla,Ma'an, Amman Airport and Queen Aliaa' Airport. Hamdi et al (2009) used several tests to detect any changes in air temperature, relative humidity and precipitation over a relatively long period of time. Their findings indicated that minimum air temperature has increased since the 1970s, which indicate a slight change in regional climate, however annual maximum air temperature records do not show clear trends and the annual range of temperature has decreased, implying that the earth is becoming more efficient in trapping terrestrial infrared radiation, which is responsible for global warming. Regarding rainfall, it was observed that precipitation has been fluctuating at all stations and no statistical trends of increase or decrease in the annual precipitations indicating climatic change were detected. As for relative humidity, the stations showed different trends increasing in some and decreasing in others, where such changes are not necessarily a result of climate change as they were accompanied by rapid growth in cultivated areas and mega hydro-projects. Hence, Hamdi et. al (2009) identified that there are some indications of climate change effects, however so far have not been pervasive and not highly significant. As has been the case with Gasmi et al. (2009), they identified that the effect differs extensively by region and time.

In the case of Turkey, climate change resulted in low or empty dams and water storage catchments, where half of the dams in Ankara and Istanbul were empty, forcing the installation of a $600 million emergency water diversion system. Moreover, more intense seasons for forest fires were evident (Sowers and Weinthal, 2010).

In the case of Israel, it was indicated that water availability is likely to decrease by 25% by the end of the 21st century which is considered the most significant impact in Israel. In addition, SLR of 10 cm may lead to retreat of coastline 2-10 meters, and to loss of 0.4-2 km2 every ten years. In the field of agriculture, the increase in temperature and decrease in rainfall will lead to increase in water demand by 20%. Finally, the increase in temperature will also result in electricity demand by 3.2% per year due to increased demand for air conditioning and cooling (Israel Ministry of Environmental Protection, 2009).

To sum up, the excepted climate changes are likely to have devastating effects on MENA countries, and especially on their agriculture and tourism sectors which play an important role in their economies as proxied by their percentage in GDP as shown in table 2.

Table (2): The Size of Tourism and Agriculture Sectors in MENA Countries

Country	Tourism as a percent of GDP* (2011)	Agriculture as a percent of GDP** (2010)
Algeria	7.2	11.7 **(2009)**
Egypt	15.8	14.0 **(2010)**
Israel	7.5	-
Jordan	20.3	2.9 **(2010)**
Lebanon	33.8	6.4 **(2010)**
Libya	3.2	1.9 **(2008)**
Morocco	19.5	15.4 **(2010)**
Syria	14.2	22.9 **(2009)**
Tunisia	17.0	8.0 **(2010)**
Turkey	10.0	9.6 **(2010)**

*Source: World Travel and Tourism Council (WTTC), available at: http://www.wttc.org/research/economic-impact-research/

**Source: World Development Indicators, World Bank.

Section Two: Impact of Climate Change on Specific Issues (Food Security, Agriculture, Water Management, Migration, Tourism, and Urbanization)

Agriculture and Food Security

All MENA countries are net food importers, and climate change has definitely serious impact on agriculture in MENA countries, which is of particular importance in such countries. Climate change causes extra strain on agriculture (which accounts on average for 15% of GDP in MENA countries as shown in table 2) which depends mainly on rain fall as it causes further problems associated with desertification, soil degradation, and water salinization (Lahache, 2009). It has been anticipated that due to climate change agricultural GDP in MENA countries is expected to decline by 22.5% by 2030. This is mainly due to more frequent crop failures, sharp reduction in animal production and herd size, and displacement of people (World Bank, 2010b). The water stress and increased temperatures will also threaten food security in MENA countries. World Bank (2011) estimated that climate change will have significant drastic effects on MENA countries, which are mainly net food importers. For example, and by 2050, wheat yields might decline by 57% and potato yields are reduced by 30% in some MENA countries. The reduction of yields on the global level is expected to drive prices up with unprecedented rates resulting for example in a rise of 32–37% for rice, 52–55 % for maize, 11–14% for soybeans, and 94–111% for wheat. A 2007 study provided estimates for MENA countries as a result of global warming where it was found for example that crop yields in a country like Syria are expected to decline by 15-20% by 2080 compared to their levels in 2000. In warmer countries as Egypt other effects are expected where several fruit species, such as olives,

peaches and apples, are not likely to flower unless they are exposed to a minimum number of days of cold temperature, which will cause drastic threats to its food security (World Bank, 2010a).

Box 1 elaborates on the challenges associated with water challenges in Morocco.

Box 1: Water Scarcity Challenges in Morocco

Morocco faces a growing challenge in the *water sector*. The main issues and constraints can be summarized as follows:

- The decline in available water resources; where the mean annual rainfall throughout Morocco under average seasonal conditions is estimated to total 150 billion cubic meters.
- The renewable water resources do not exceed 29 billion cubic meters (bcm). Taking into account potential storage sites and groundwater development possibilities only 20 BCM are divertible annually, 16 BCM from surface water and 4 bcm from groundwater.
- Some 103 large dams have been built increasing the storage capacity from 2.3 billion cubic meters in 1967 to 16 bcm in 2003. It has required a major investment spending estimated at 2.5% to 3% of the country's GDP or 18% of the public investments.
- Morocco is endowed with groundwater resources. Some 32 deep aquifers and more than 46 shallow ones scattered all over the country have been inventoried.
- Groundwater withdrawals have increased from I bcm in 1960 to 3.6 bcm in 2003.
- Some 11 bcm are now committed to agriculture, domestic and industrial uses.
- The sustainable upper limit or "carrying capacity" of water resources utilization will be approached by the year 2020 due to increase in population coupled with demands for high per capita domestic and industrial consumption.
- Per capita renewable water resources are expected to fall from 850 cubic meters to 410 cubic meters in 2020 when all renewable resources are projected to be mobilized.

Due to the aforementioned challenge, Morocco will be classified as *chronically water stressed* instead of being *water stressed* country. Water scarcity problem will be worsen by the rapid degradation of water quality, inadequate maintenance of existing infrastructure and silting of reservoirs, low level of potable water provision to rural population in addition to the low water use efficiency in irrigation.

Source: Barrio, Antonio Marquina (2005).

Agriculture, Water Management, and SLR

The problem of water management is more acute in the MENA countries, relative to other countries, which suffer from scarcity of water resources even in the absence of climate change problems. On average, MENA countries count for 7% of total world population whereas they acquire only 3% of water resources, and estimates for the future have expected a decline by 28% by 2030. The problem is further exacerbated by the disproportionate distribution of water resources within the MENA countries where rainfall is concentrated in few weeks in winter, frequent summer seasons face drought, and the regional distribution of water resources suffer from huge heterogeneity (Lahache, 2009). The projected increases in temperature during the irrigation season will significantly increase the demand for water which will cause an overall reduction in water availability. Also the increased demand for irrigation water will cause further stress on ground water resources (World Bank, 2010a).

Moreover, there are specific problems associated with a number of countries. For example, in the case of Egypt, the SLR is likely to intensify the water stress problem (El Raey, 2012). The combined impact of salt water intrusion resulting from SLR and increased oil salinity due to increased evaporation are expected to reduce the quality of shallow groundwater supplies in Nile Delta coastal areas. The 1 m SLR is expected to result in huge loss of GDP (estimated to be 6.5%) mainly associated with loss in agricultural GDP and Alexandria, the second largest Mediterranean city is expected to disappear, putting Egypt in the third rank worldwide likely to be negatively impacted by the SLR. Moreover, storm surge is expected to increase, which will further negatively affect the agricultural land and crops, where for example a reduction in the productivity of two major crops in Egypt: wheat and maize by 15% and 19% respectively by 2050 is expected (Ministry of State for Environmental Affairs, 2010). It is not clear how SLR will affect the Nile Basin due to the uncertainty associated with projected rainfall patters in the basin and the complex water management system. However, in general, the increase in temperature and frequent occurrence of extreme events will reduce crop yield as well as cause changes in the agricultural distribution of crops. It will also negatively affect the marginal land and force farmers to abandon them hence increasing desertification and unemployment. The expected decrease in rainfall accompanied by coastal zone effects will have negative repercussions on the agriculture sector, especially when accompanied by the increased population growth rates which will divert water usages from agriculture to other consumption uses. This will create extra pressures on the government to search for other water resources and import grain and food staples to satisfy the increasing need of food products (Beshara, 2008). Coastal tourism is likely to be negatively affected as well. For example, coral reefs in Red Sea resorts are highly vulnerable to climate change, whereas the SLR will lead to loss of beaches on the Mediterranean coast, and increasing frequencies and severity of extreme events are expected to negatively affect the archaeological heritage in Egypt (Ministry of State for Environmental Affairs, 2010; Abu-Zeid, 2010). Hence, serious effects are expected to be foreseen before 2050 where the 1 m SLR is anticipated to negatively affect the Nile delta causing displacement of around 6-7 million people and around 4,500 square kilometers of cropland is expected to be lost (Elsharkawy et. al, 2009; Ministry of State for Environmental Affairs, 2010). Such effects have negative repercussions on economic, social, and political levels due to the rise in unemployment resulting from reduced economic activities associated with agriculture and tourism. Moreover, climate change has trans-border effects where climate change is expected to have significant variation in the Nile stream flow as some studies have predicted a decrease of 70% in the annual Nile flow (Beshara, 2008). This is likely to affect Egypt's relations with Nile Basin countries regarding the distribution of Nile water.

In Jordan, the Initial National Communication (INC) to the United Nations Framework Convention to Climate Change (UNFCCC) forecasted that Jordan is likely to suffer from more erratic rainfall patterns, reduced ground water availability, more frequent dust storms, and increased temperatures in the coming three decades. Such changes are likely to have a negative impact on agricultural productivity (especially barely grain yield) and sustainability. Sustainability is likely to be affected through two interrelated ways mainly through diminishing the long term ability of agroecosystems to provide food and fiber and by inducing shifts in agricultural regions that may encroach upon natural habitats, at the expense of floral and faunal diversity. Hence, such changes caused by climate change may encourage the expansion of agricultural activities into regions that are now occupied by natural ecosystems such as rangelands in the Badia region and forests (Khresat, 2009).

In Morocco, climate change is expected to result in increasing temperatures in all seasons, which will decrease precipitation rates and rainfall levels, and hence create extra pressures on withdrawal of ground water. According to some studies, the decrease of the annual groundwater recharge by rainfall is expected to be in the range of 40-68% from the climate centered in 1990 to the climate centered in 2050 (Van Dijck et. al, 2006). Such changes are likely to have serious repercussions on the agriculture sector and yields of agricultural products.

In Tunisia, a number of studies investigated the negative impact of climate change on agriculture. For example, Gasmi et al (2011) found that future increases in temperatures between 1.5 and 3.5°C may reduce the yield of wheat in the Beja and El-Kef district in Tunisia between 16% and 19%. Gasmi et al (2011) confirmed that the impact varies significantly between different regions and over time.

Turkey is likely to be negatively affected by SLR with specific harsh effects due to the high number of Turkish population who live in coastal areas. For example, and despite the fact that the coastal Turkish cities cover less than 5% of its total surface area, more than 30 million people live in these coastal areas. Moreover, the urban population has been growing rapidly in such coastal areas, from 14% of the total population in 1950 to 70% in 2000. Such pattern of rapid population growth is expected to continue. This implies that such intensive migration from eastern and south-eastern Turkey to the large coastal cities (such as Istanbul, Izmir, Adana, Antalya, and Alanya) contributes to more population being exposed to SLR (Karaca and Nicholls, 2008) Generally, the sea-level changes of the Turkish coast experience an accepted range of SLR. However, the SLR has been substantially greater than the global rise level within a number of Turkish larger river deltas (Güven, 2007).

In Syria water resources are highly limited resulting in classifying Syria as an arid or semi-arid country. The country is largely dependent on rain water. The total of surface water was estimated to approximately 10 billion m3, while the ground water amounted 5 billion m3. The average annual per capita share of water amounts to slightly over 1000 m3, a low figure compared to 7500 m3 at global level. The per capita share of water is expected to drop to 500 m3 in 2025. Due to persistent drought, population growth and the irrational use of hydrological resources, water availability is currently under pressure causing extra water stress (UNFCCC, 2010)

Migration and Urbanization

The negative impact of climate change on agriculture is likely to have further negative consequences on rural-urban migration, which is likely to increase and hence further affects urbanization process, with its associated problems dealing with housing, job opportunities, and investments in infrastructure. The urbanization process itself, combined with relatively high population growth, is expected to further intensify the problems associated with climate change, including mainly more CO2 emissions. In fact, MENA countries do not fair equally in production of CO2 emissions where oil producing countries shoulder the biggest share (e.g. Egypt and Algeria together with GCC countries). The CO2 emissions have increased dramatically in the last two decades in MENA countries mainly due to increased fuel combustion (Elasha, 2010) (see table 1).

In Syria the three cropping seasons 2006/2007; 2007/2008; 2008/2009 suffered severe drought. Such series of droughts had serious significant impacts on job opportunities and wealth loss. It was estimated that around 1.3 million people were affected by such droughts. The drought caused severe food and water shortages where many farmers suffered crop failure and 70% of animals belonging to small and medium scale herders had to be sold at very low prices due to lack of pasture and soaring feed costs. As a result income levels were reduced significantly. The drought also led to displacement of people where around 1.5 million people had to migrate to cities searching for new job opportunities (World Bank, 2010). Such incidents resulted in increasing the level of poverty which could have been lessened if appropriate measures have been timely undertaken, which has not been the case (Sowerly and Weinthal, 2010). The problem is magnified in Syria due to SLR and its impact on displacement of people. For example, and despite the fact that the coastal region forms only 2% of Syria's total area, more than 11% of the population live on such area. The coastal area is of extreme importance to food security as well as several industrial activities are concentrated there (38% of national cement production and 50% of national oil refining) (Ibrahim, 2003). The rise in

sea level might adversely affect a number of the coastal zone's physical, ecological, biological, and socioeconomic characteristics, which are already under stress and could magnify the displacement problem (UNFCCC, 2010).

Tourism and Other effects

Tourism represents a major activity in MENA countries accounting for around 2-12% of GDP in these countries (table 2). Tourism will be negatively affected by climate change through more than one channel including high temperatures, water availability, and prices of international transport. Regarding energy issues, the MENA countries are heavily dependent on fossil fuel. This in itself causes several problems associated with the high uncertainty of oil prices, recoverable fossil fuel reserves, and carbon price (Lachache, 2009).

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Part Two: A Quantitative Analysis of Climate Change and its Effects on MENA Countries[5]

This part focuses on a quantitative analysis of climate change and its economics effects in MENA countries. The first question to be addressed is to know to what extent climate change has already started in MENA countries. Using the new TATP (2009) database for 808 MENA micro areas for temperature and precipitations over the period 1900-2008, statistical tests related to structural changes make it possible to calculate the rise in temperatures and the decrease in precipitations which have already occurred since these structural changes. This is undertaken in section one where many graphs and maps will be presented in order to highlight our results.

The second section is dedicated to the effects of climate change on GDP (and GDP per capita) in MENA countries. Panel data econometric techniques are implemented in addition to spatial econometrics in order to answer this question.

Section One: Global Warming and Other climate Changes in MENA Countries: Fiction or Reality?

This section is aimed at shedding light into global warming in MENA countries. Several questions will be investigated. First, has the global warming progress already taken place in these countries? If so, since when has this process started? What is the rise in temperatures faced by these countries since the beginning of this process? Is this process accompanied with a fall in precipitations? This section will pave the way for the assessment of the impact of global warming in the growth and convergence process in MENA countries. This assessment will be investigated later (section 2).

The first subsection will provide a brief presentation of the database and stylized facts about air temperature in MENA countries. The next subsections will be dedicated to the econometric analysis which is aimed at detecting and characterizing global warming in MENA countries both at country level (subsection 2) and at a detailed geographical level (subsection 3). The last subsection focuses on precipitation changes in these countries.

[5] This chapter has been written by Nicolas Péridy and Marc Brunetto. We are grateful to Mohamed Hazem for helpful research assistance.

Overall this section, the objective is simply to observe and comment long run series of temperature and precipitation and to detect potential structural changes. However, we do not intend to answer the question whether recent trends will continue in the future. In other word, the section does not intend to forecast temperature and precipitations in the future.

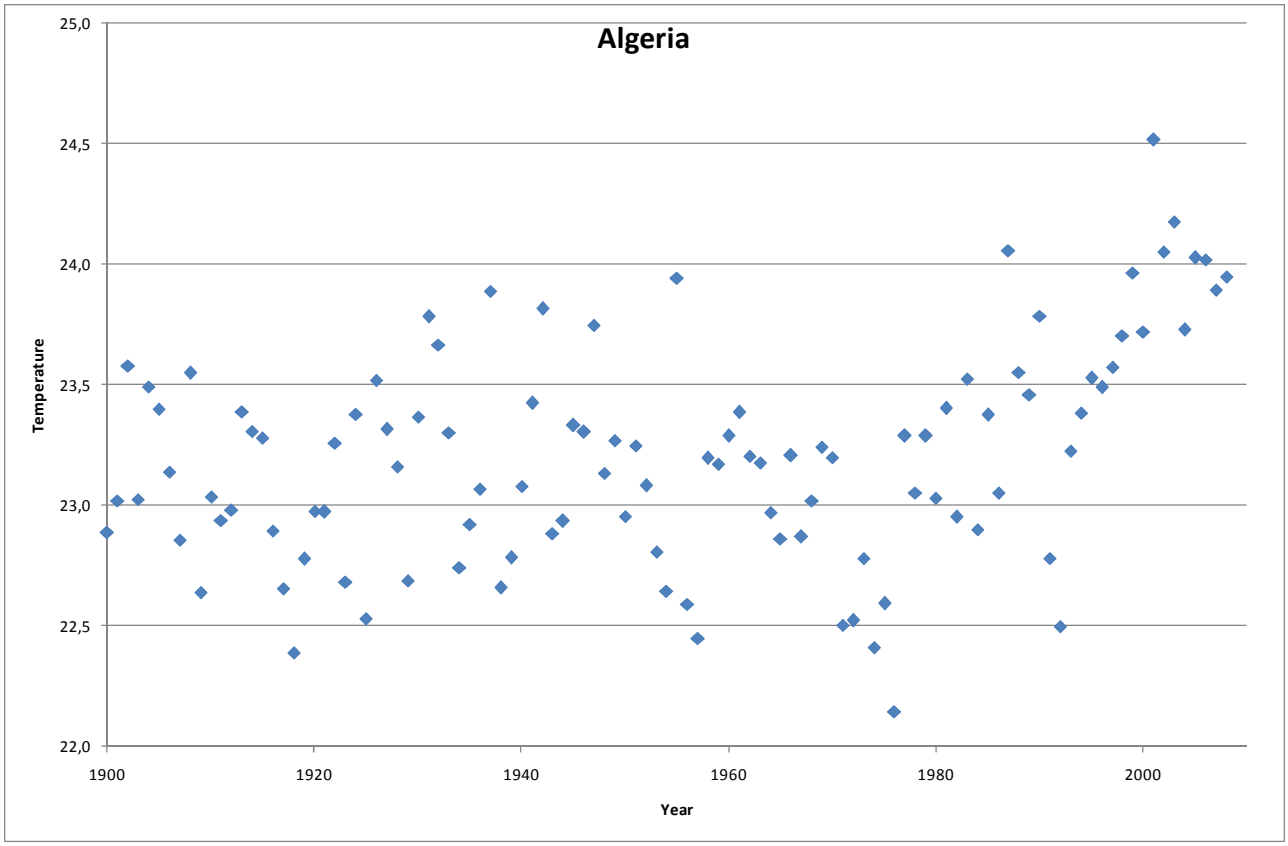
a) Description of the database and stylized facts at country level

The database used in this section is based on "Terrestrial Air Temperature and Precipitation: 1900-2008 Gridded Monthly Time Series", version 2.01 (Matsuura and Willmott 2009). This dataset provides monthly average temperature and precipitation from 1900 to 2008 for a large set of geographical cells, measured at a 1 degree longitude and 1 degree latitude resolution at a global scale. Data are spatially interpolated on the basis of station climatologies available. For all details concerning data, refer to Matsuura and Willmott (2009).

The data downloaded for MENA countries provides the following number of cells: Algeria: 255; Egypt: 106; Israel: 9; Jordan: 17; Lebanon: 4; Libya: 171: Morocco: 81; Syria: 33; Tunisia: 30; Turkey: 102. Overall, 808 cells are available. For each cell, we calculated the annual average temperature from monthly data. This makes it possible to get a time series of 109 observations for each cell. Country averages have also been calculated in order to get insights into global warming at country level.

Figures 1 shows the time series at country level corresponding to air temperature since 1900.

Figure 1: Annual average air temperature in MENA countries (°C, 1900-2008)


Algeria
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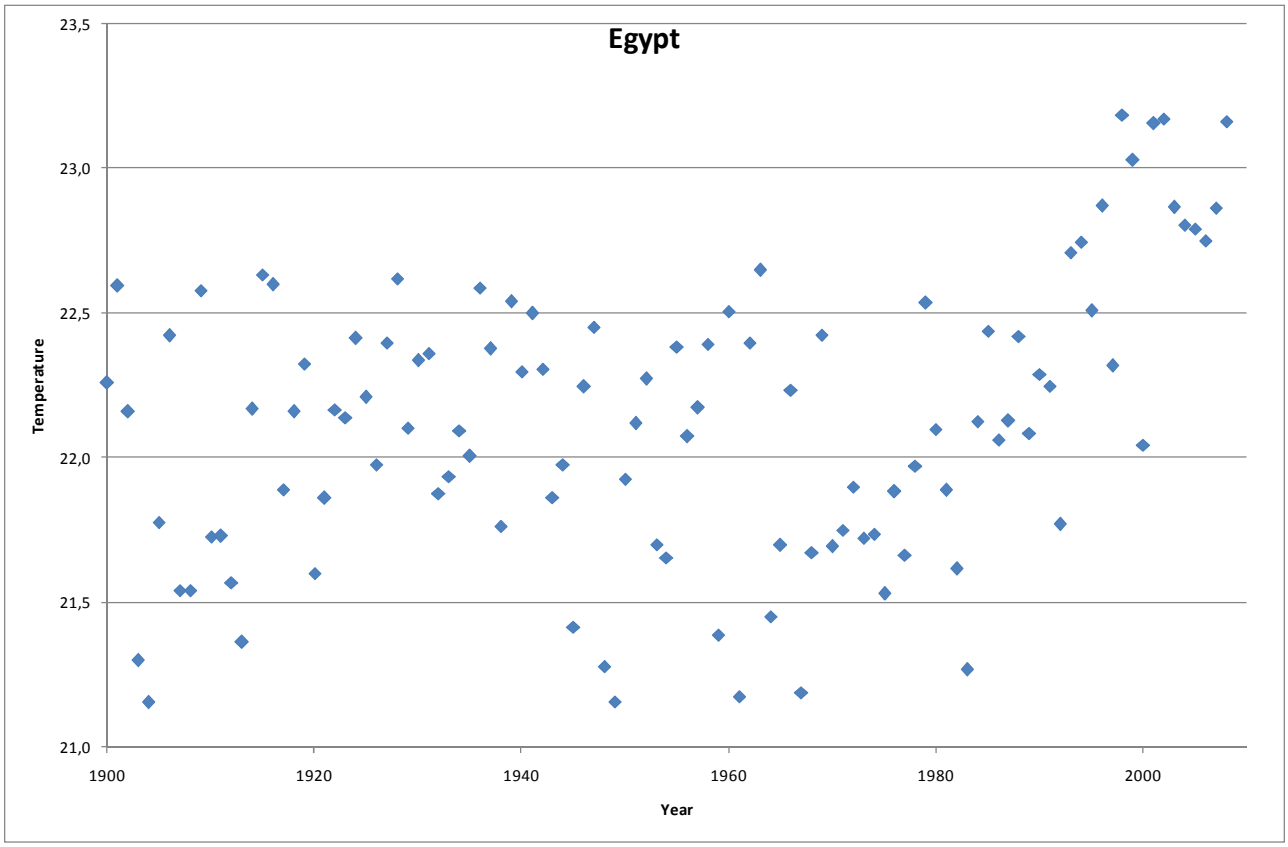
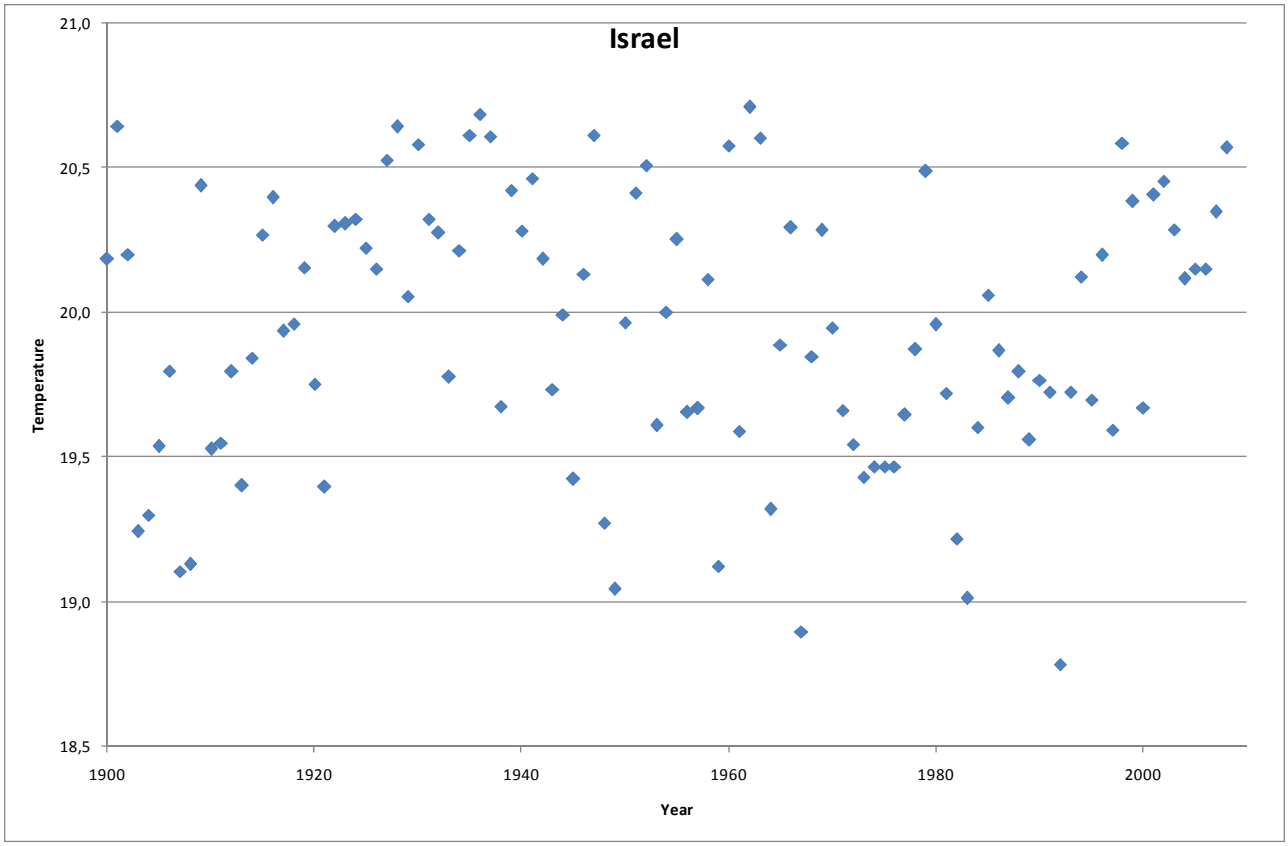
24,5
24,0
23,5
23,0
22,5
22,0
Temperature
1900
1920
1940
1960
1980
2000
Year


Egypt
23,5
23,0
22,5
22,0
21,5
21,0
Temperature
1900
1920
1940
1960
1980
2000
Year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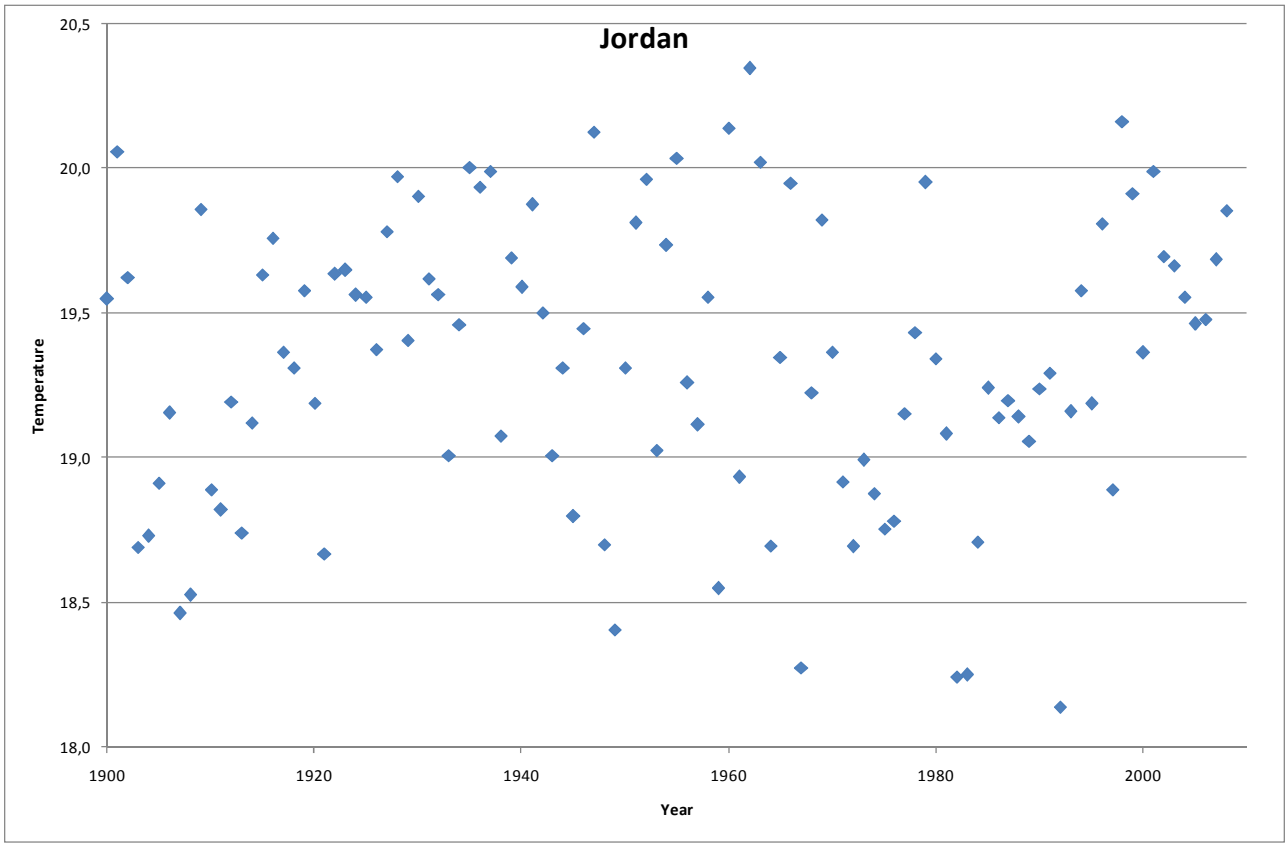
20,5
20,0
19,5
19,0
18,5
Temperature
1900
1920
1940
1960
1980
2000
Year


Jordan
20,5
20,0
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19,0
18,5
18,0
Temperature
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1980
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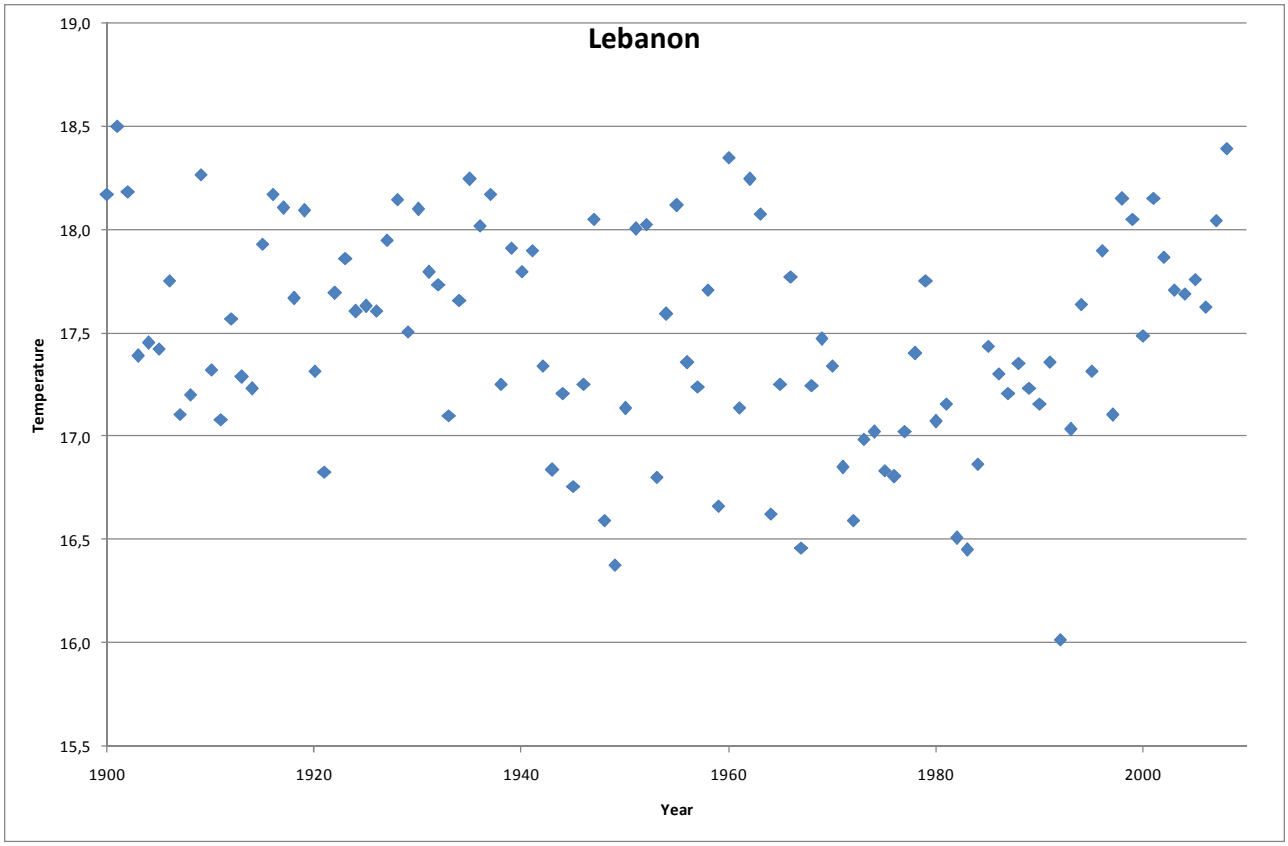
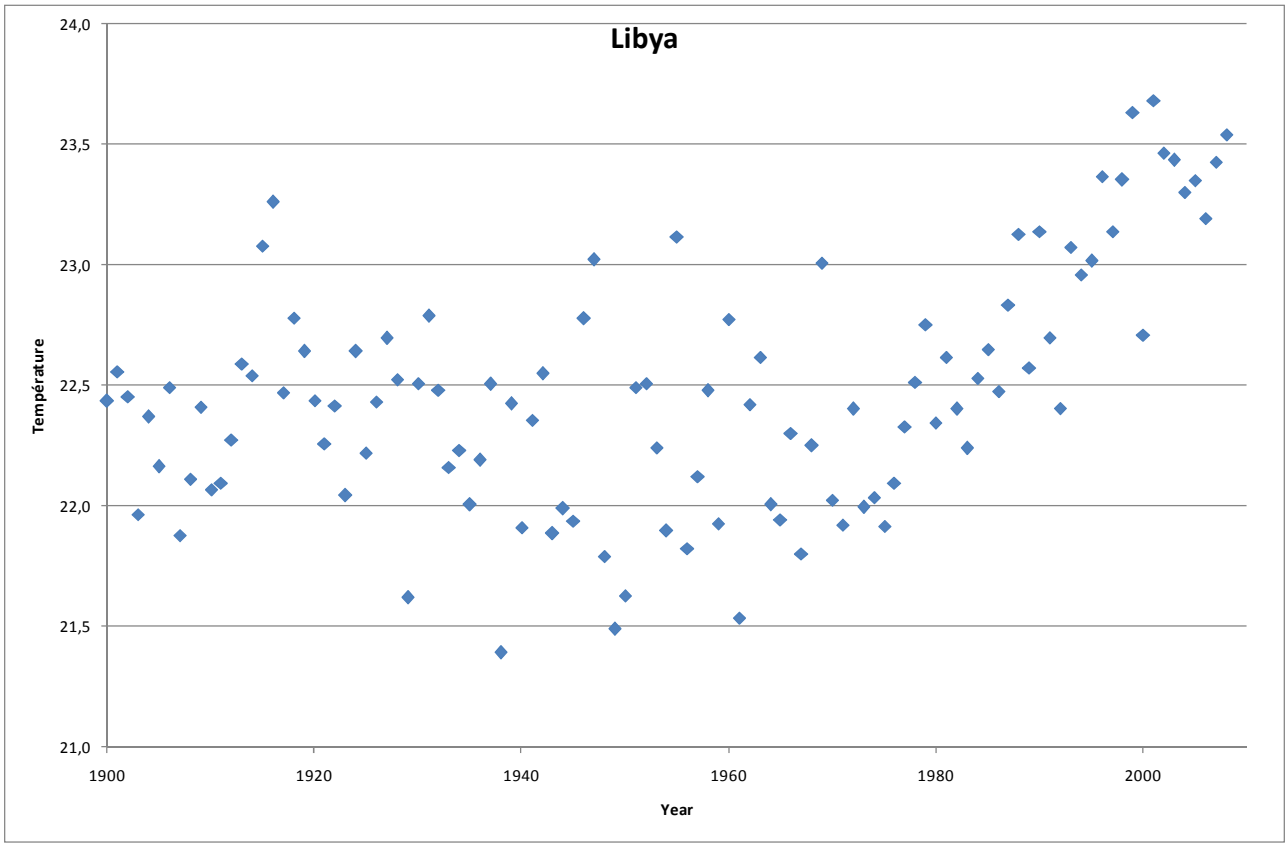
Year


Lebanon
19,0
18,5
18,0
17,5
17,0
16,5
16,0
15,5
Temperature
1900
1920
1940
1960
1980
2000
Year


Libya
24,0
23,5
23,0
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Température
1900
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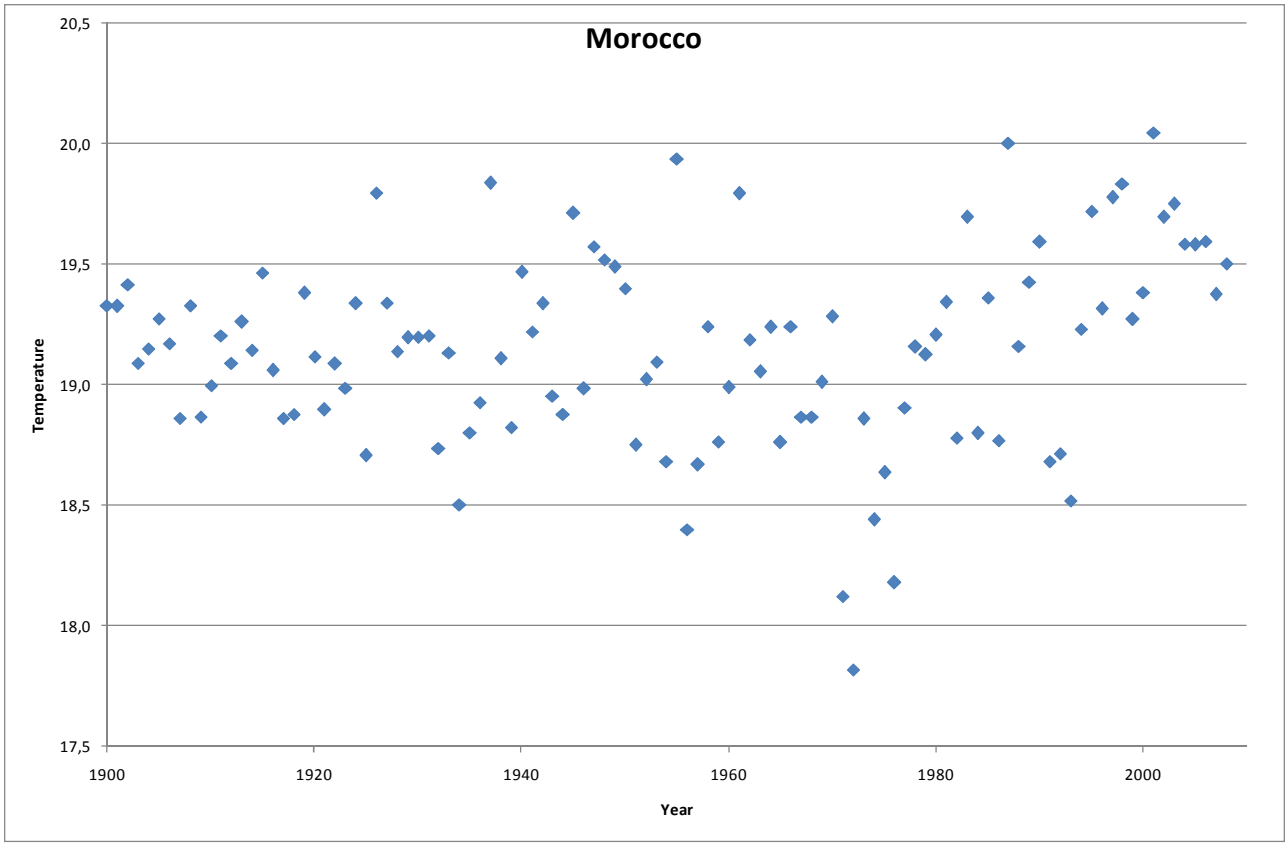
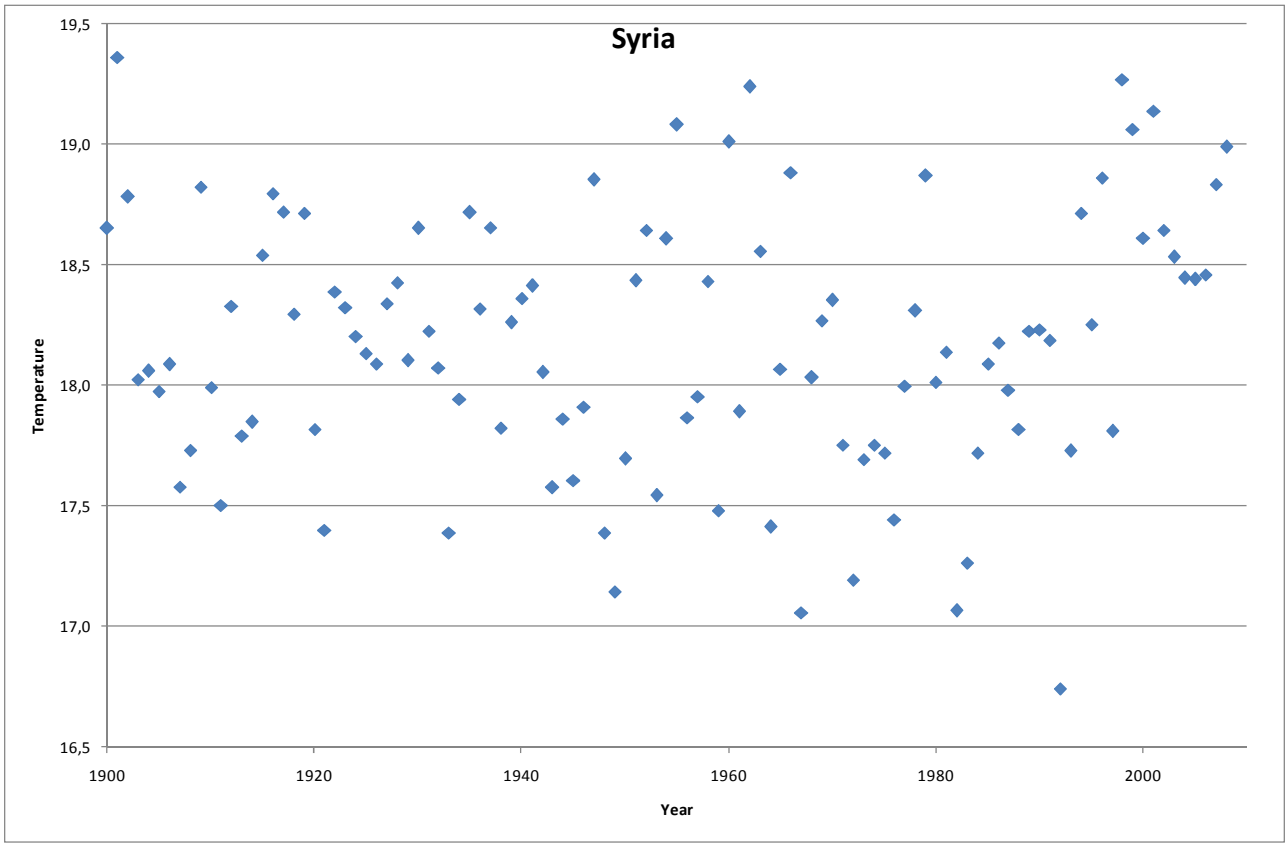
Year


Morocco
20,5
20,0
19,5
19,0
18,5
18,0
17,5
Temperature
1900
1920
1940
1960
1980
2000
Year


Syria
19,5
19,0
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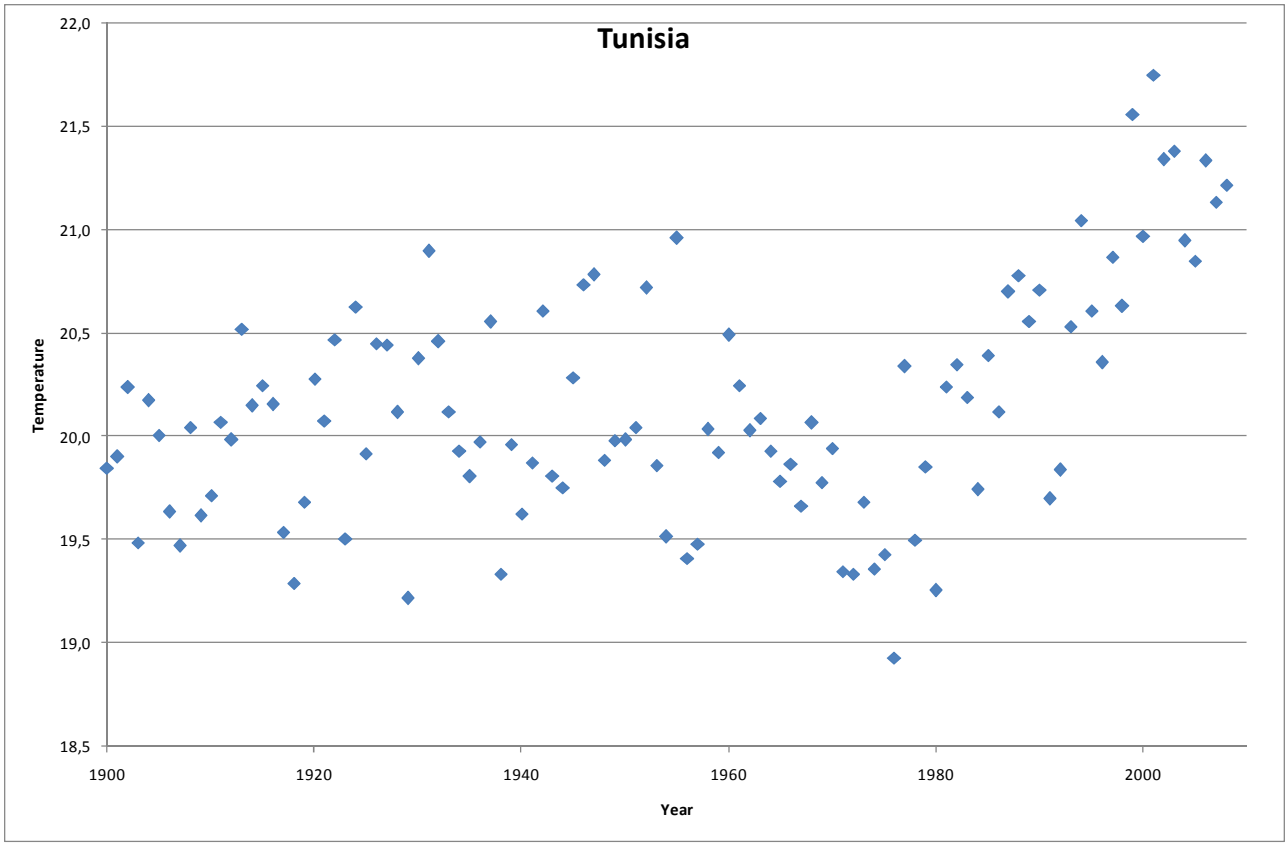
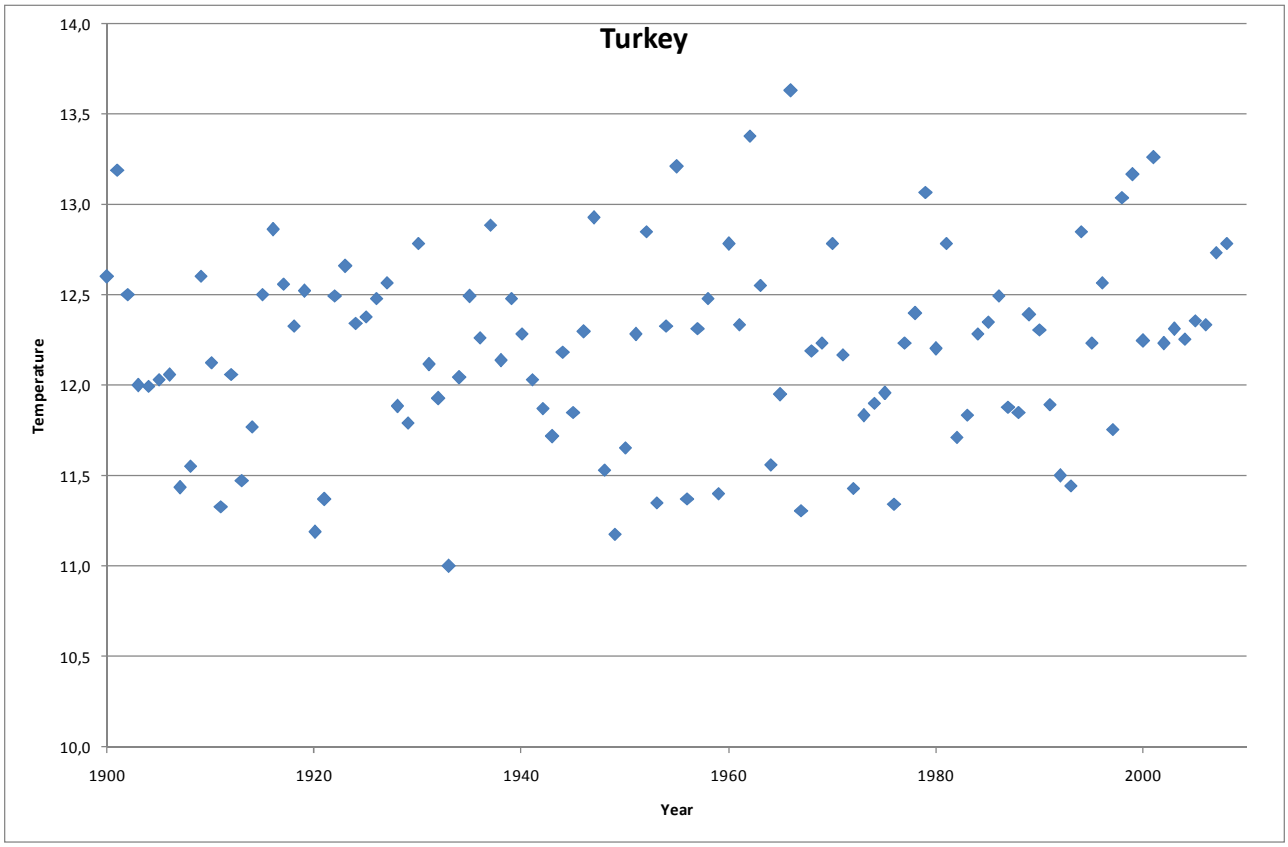
17,5
17,0
16,5
Temperature
1900
1920
1940
1960
1980
2000
Year





A first striking feature is that in most countries, a rise in the average temperature can be generally observed from the 70s or the 80s onward. It can thus be suspected from these graphs that the global warming process has already started in these countries.

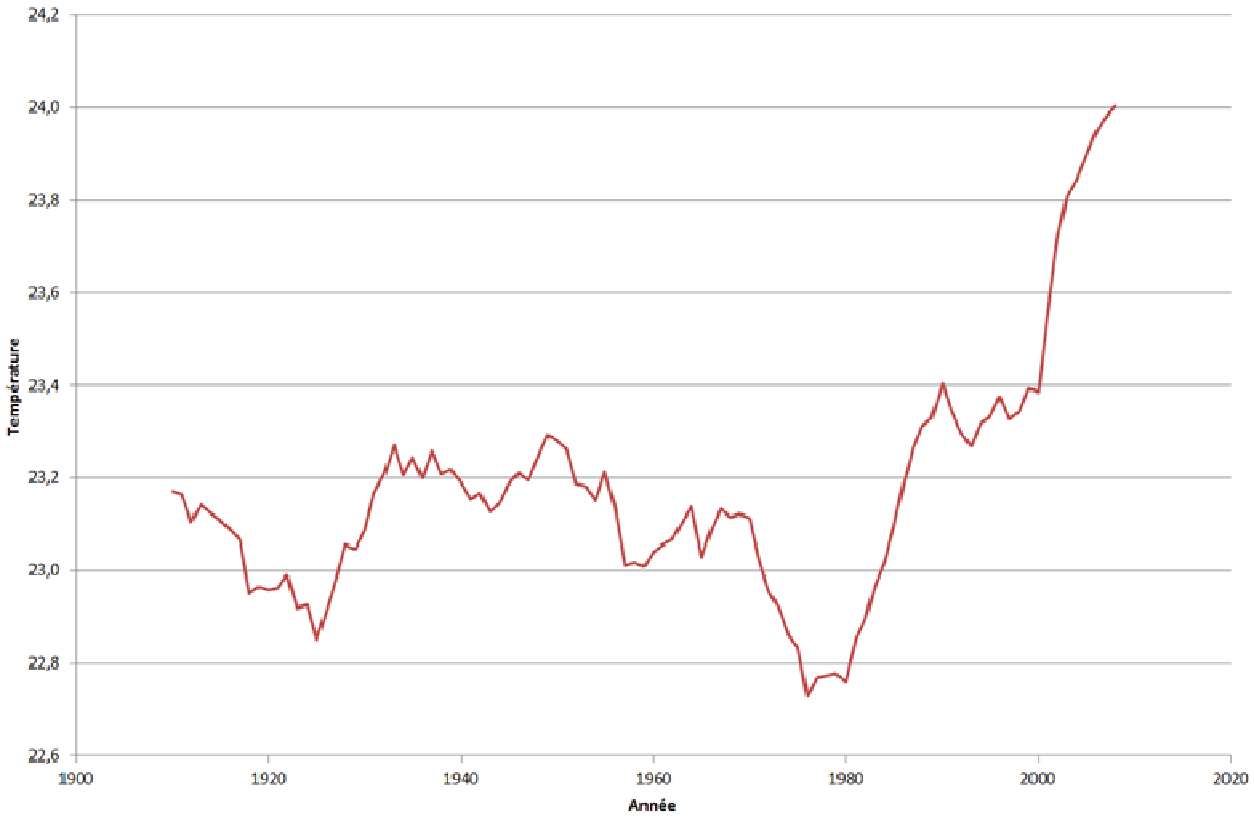
Another set of results shows the moving average of air temperature by taking a 10 year period (Figure 2). This method makes it possible to smooth annual variations. As a result, medium and long run trends appear more clearly. In this regard, Figure 2 confirms the conclusion reached from Figure 1 that the global warming process appears in most countries from the 70s. However, three groups of countries can be considered. The first group includes North African countries, i.e. Algeria, Egypt, Tunisia and Morocco to some extent. In all of these countries, there is a clear rise in the average temperature from the 70s onward, after a period of roughly stable temperatures. In these countries, the suspicion on global warming is the most important.

The second group of countries includes Near-East countries (Israel, Lebanon, Jordan and Syria). The countries are characterized by an increase in the moving average temperature after a period of temperature decrease (generally from the 30s to the 70s).Turkey is the third and special case with strong random variations within a small increasing trend.

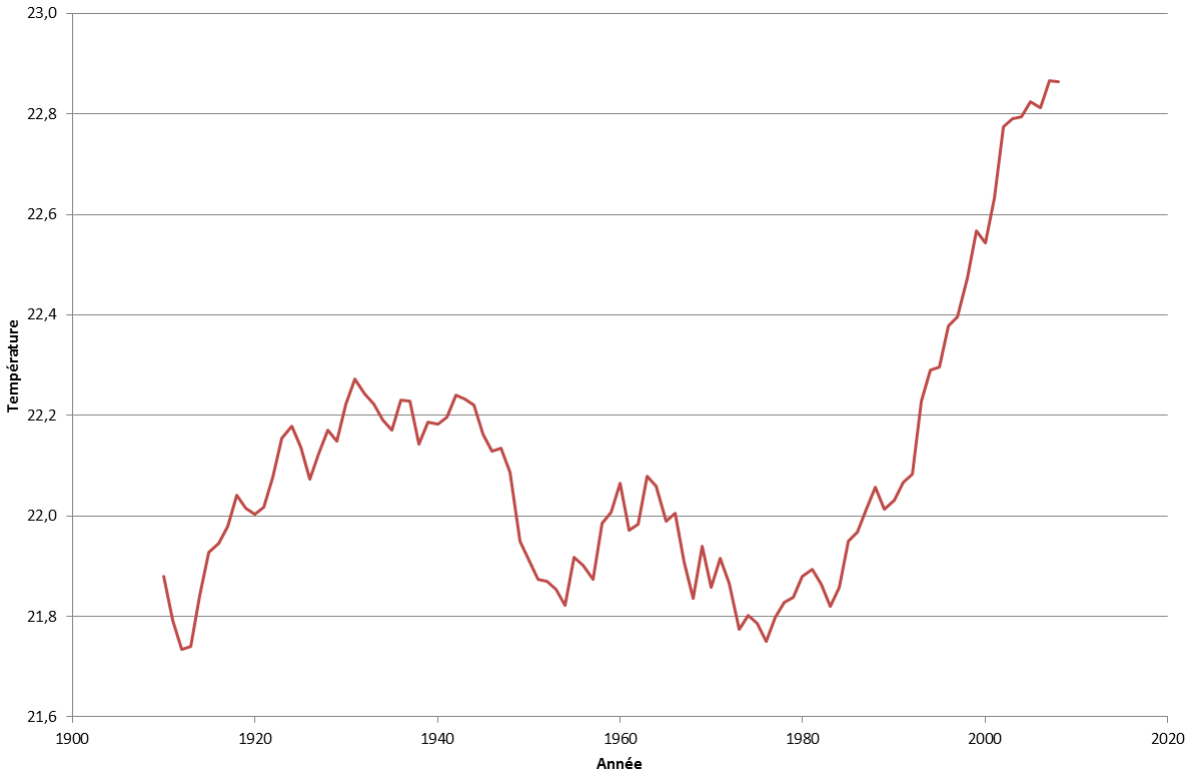
Whatever the differences across countries, a rise in the moving average can be observed in recent years, which is an indication of climate warming.

Figure 2: Moving average air temp. in MENA countries (°C, 1900-2008, 10 years period)

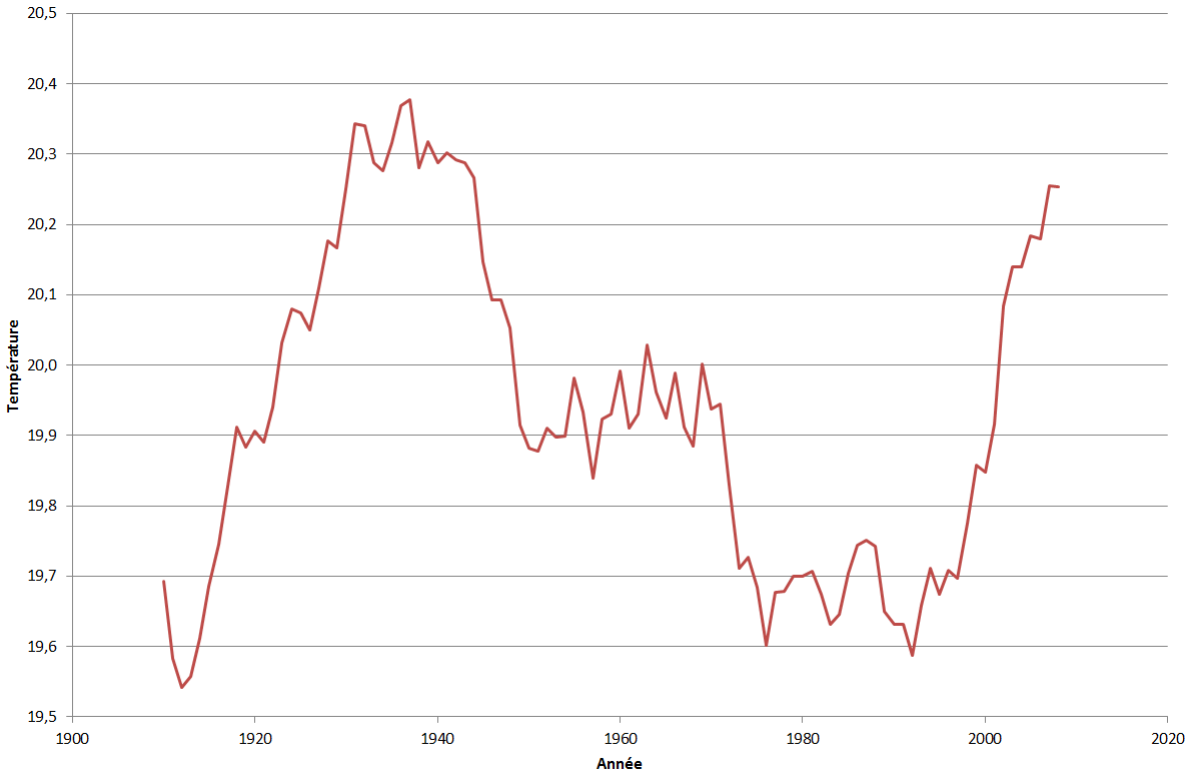
a) Algeria



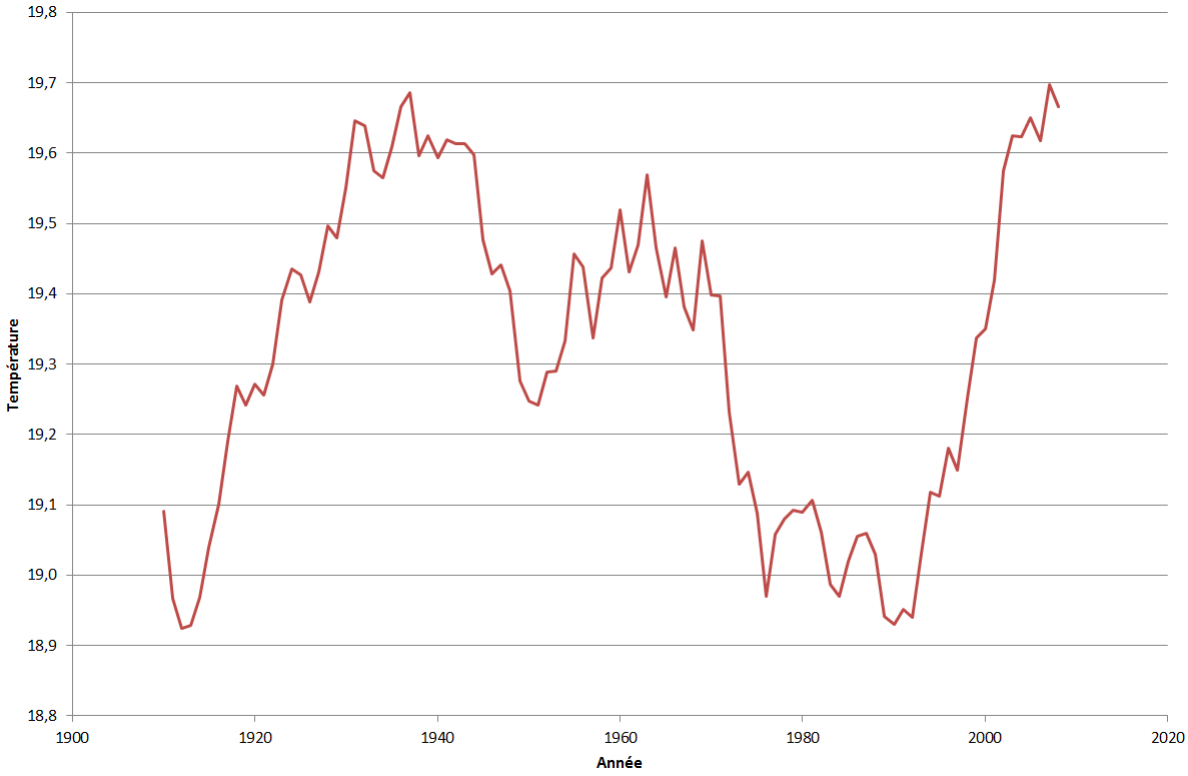
b) Egypt



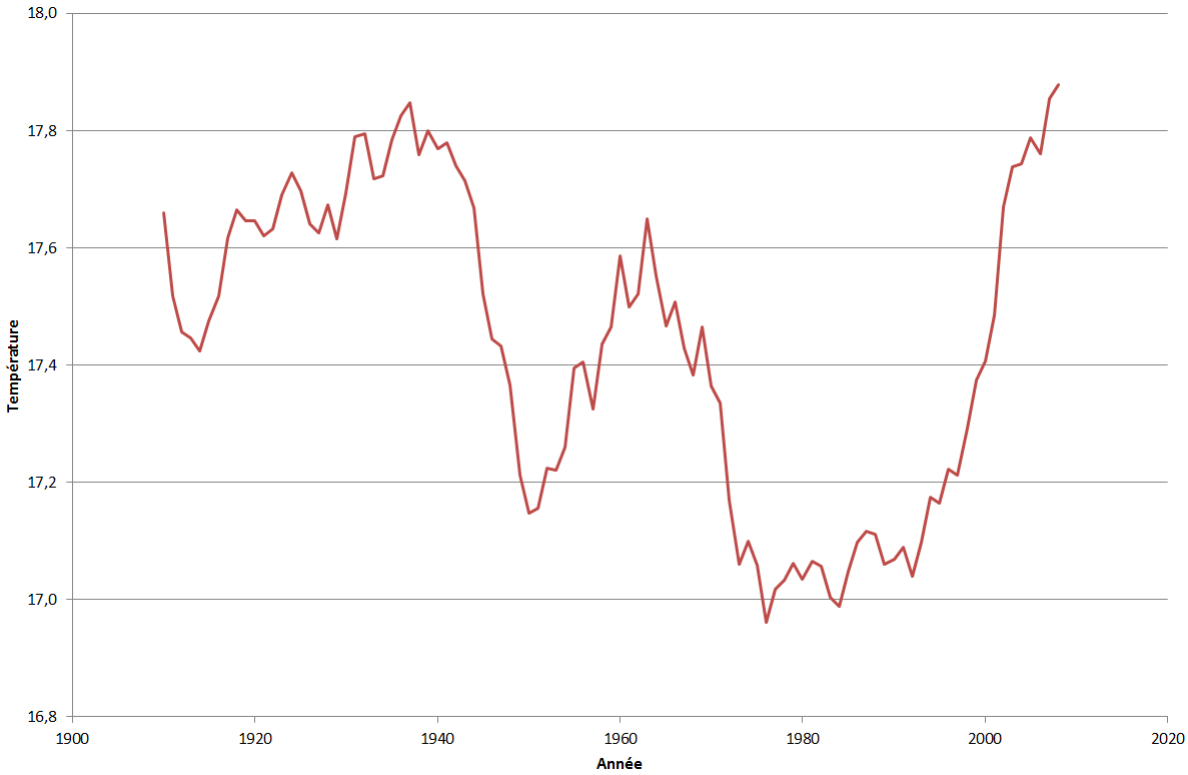
c) Israel



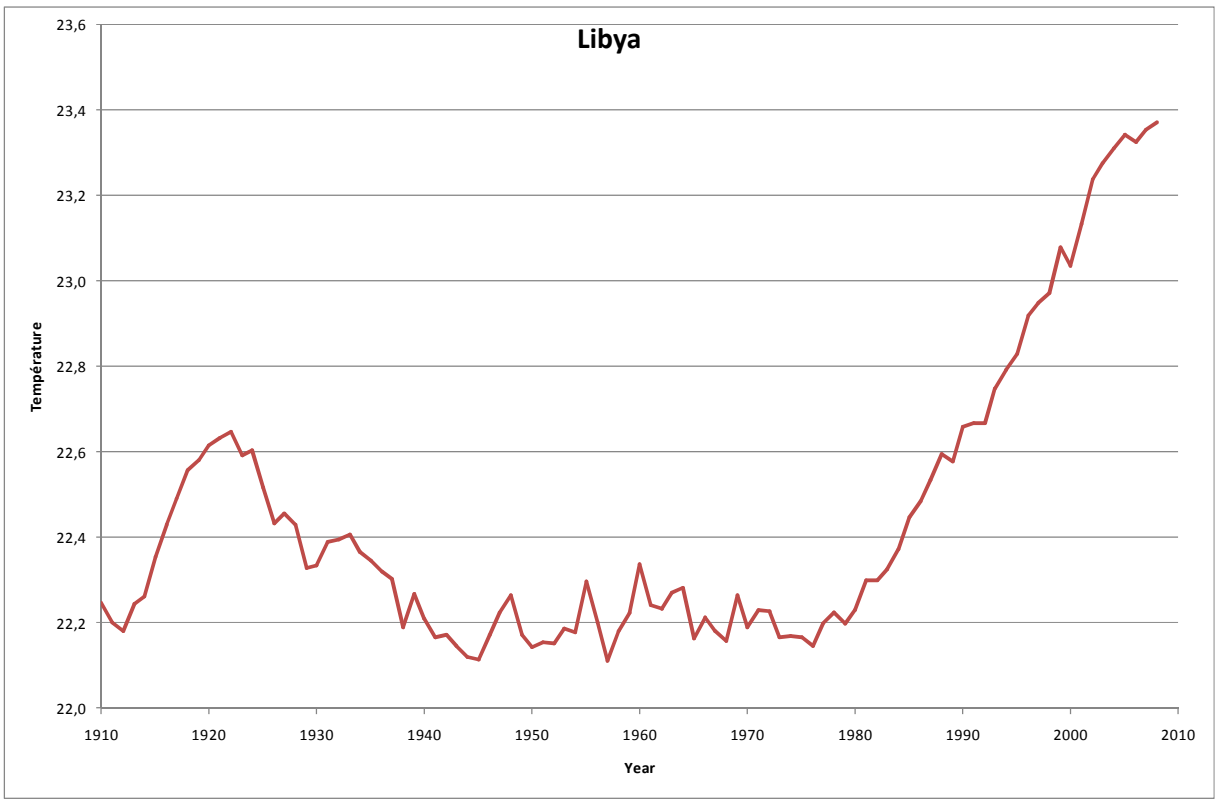
d) Jordan



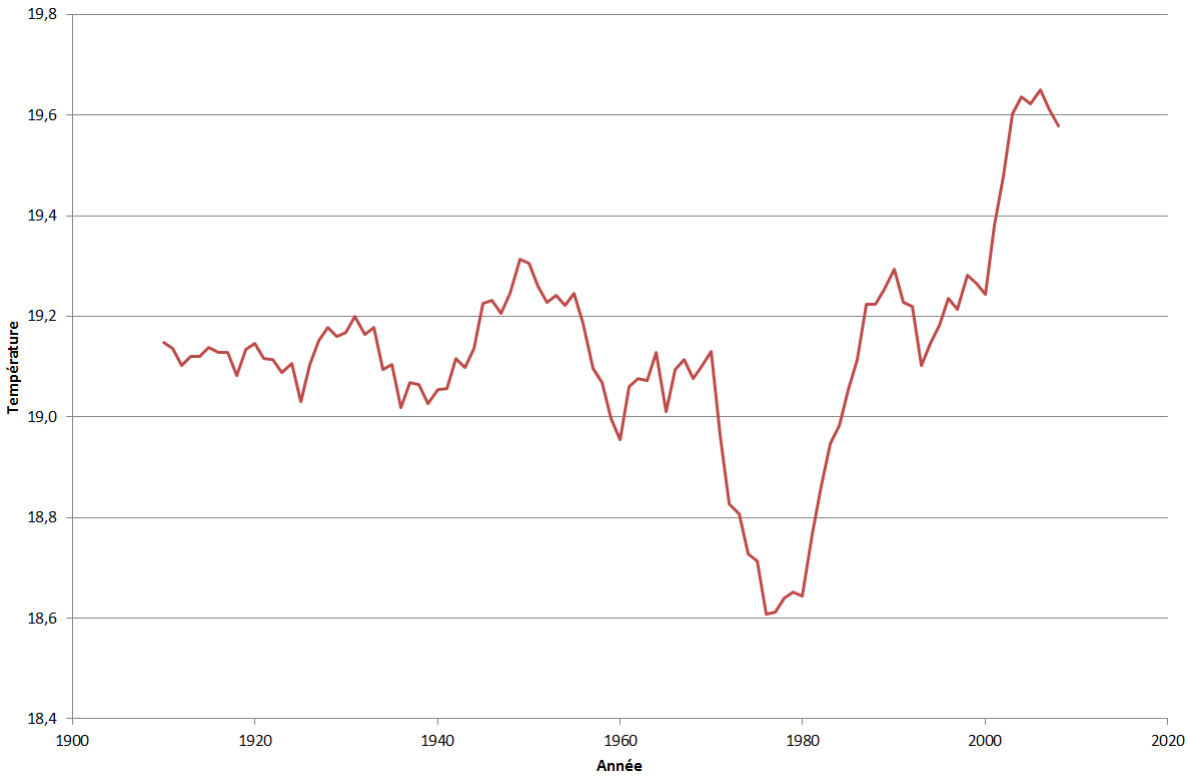
e) Lebanon



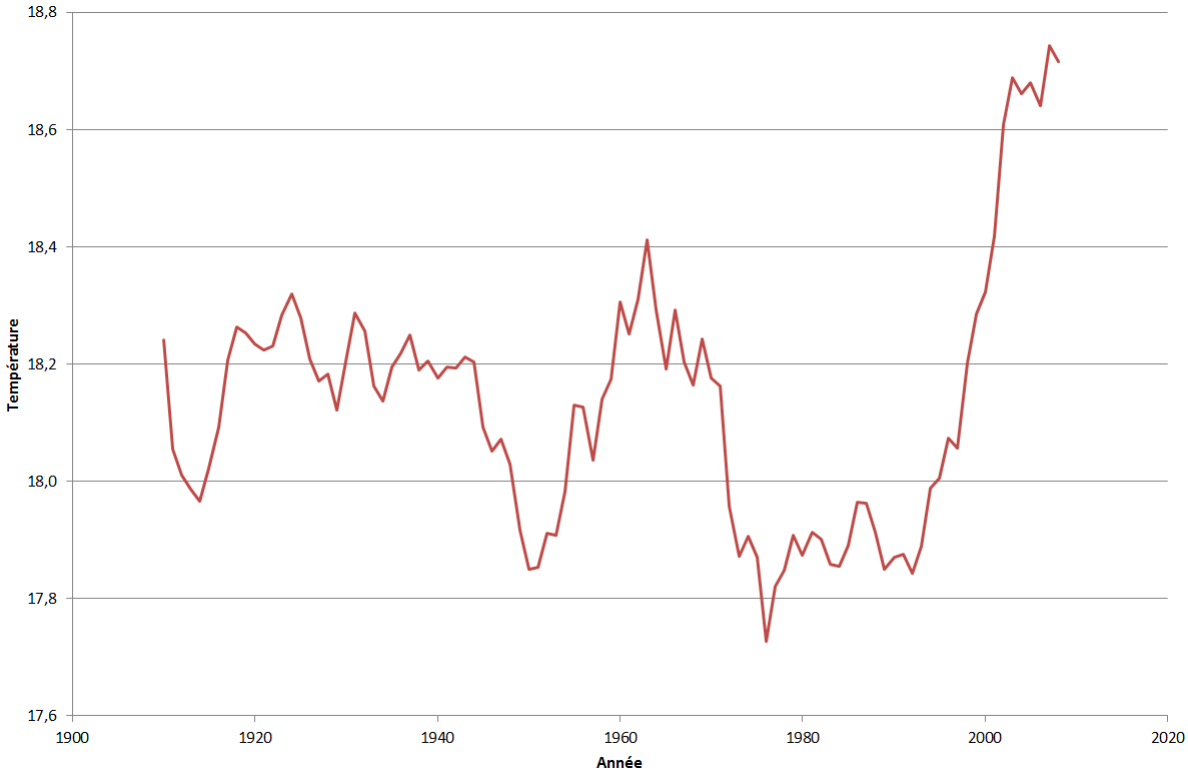
f) Libya



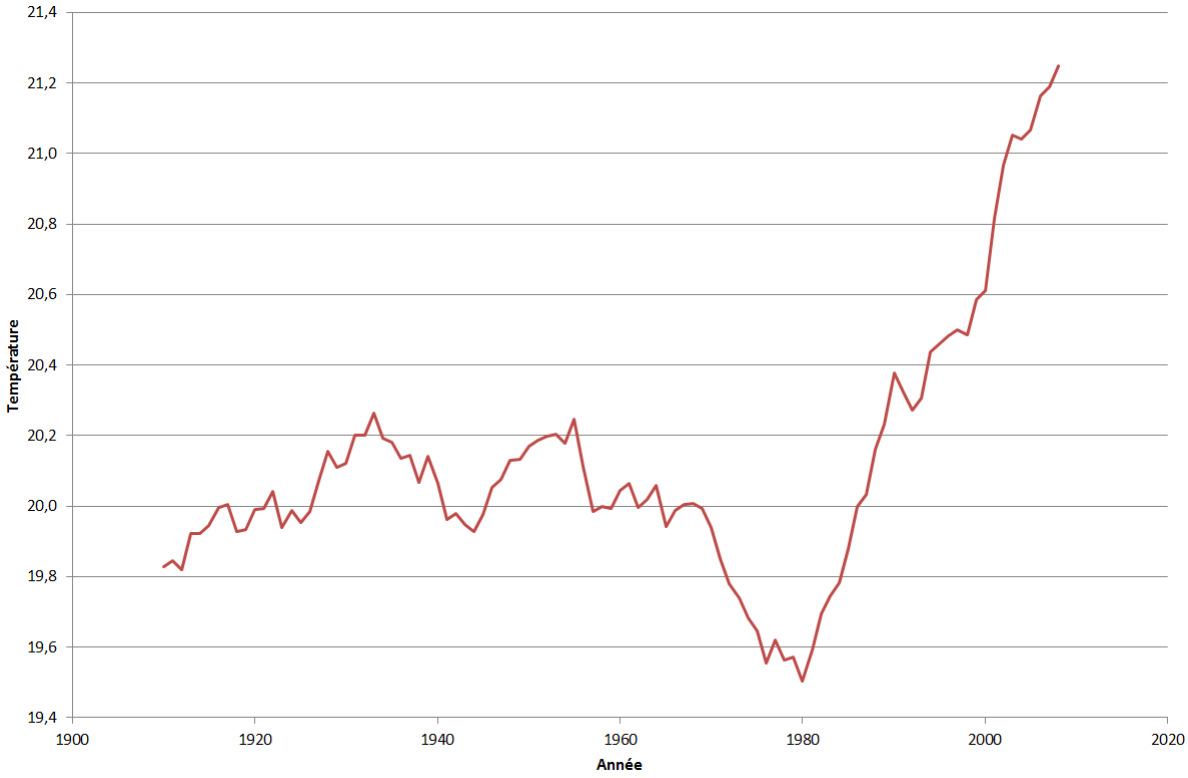
g) Morocco



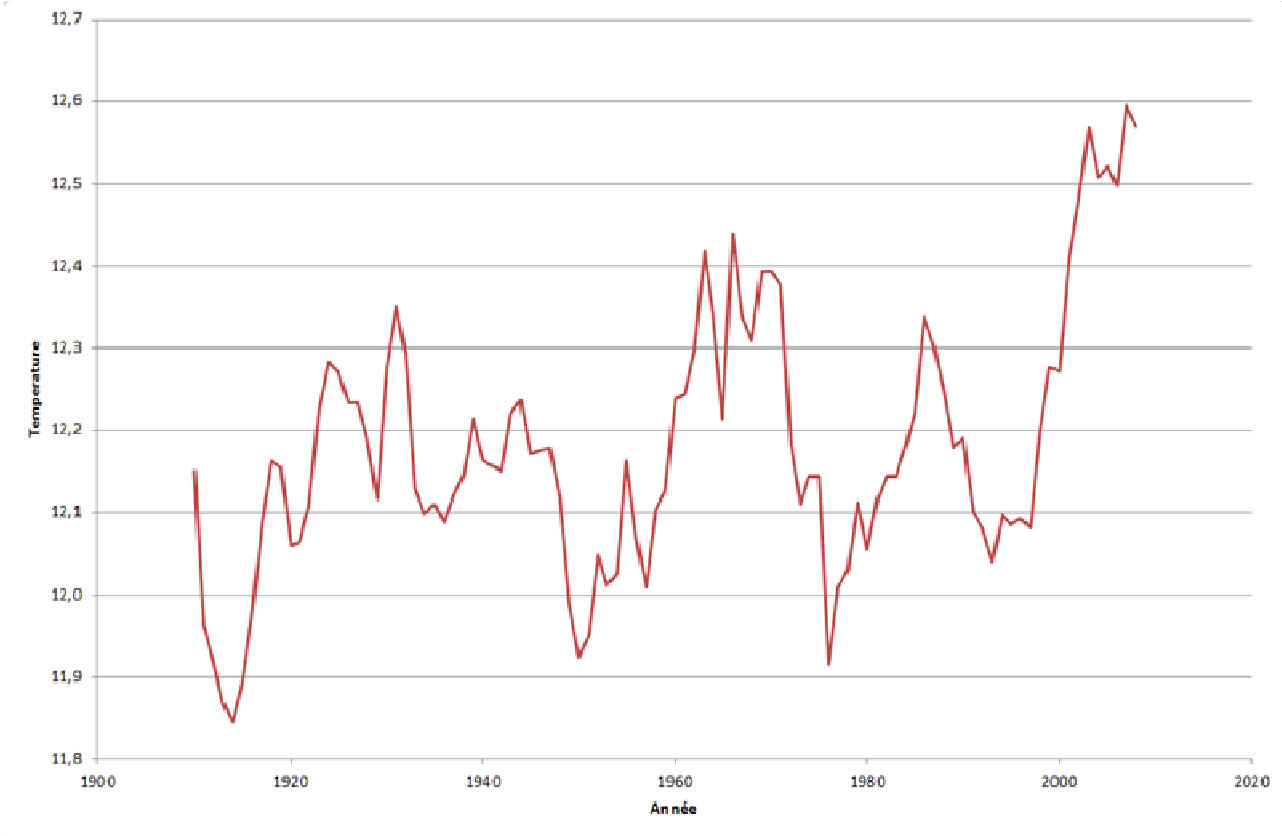
h) Syria



i) Tunisia



j) Turkey



A final interesting set of observations can be obtained by taking the successive 30 years average temperatures in each country. This period of time has been chosen because it is recognized by climatologists as the appropriate period to characterize a climate in a given area. Consequently, any change in the average temperature for each successive 30 years period is an indication about climate change. Table 1 summarizes these data for each MENA country.

Table 1: Annual average temperature for 30 years periods (°C)

	1900-29	1930-59	1960-89	1990-2008
Algeria	23,1	23,2	23,1	23,7
Egypt	22,0	22,0	21,9	22,7
Israel	19,9	20,1	19,8	20,0
Jordan	19,3	19,4	19,2	19,5
Lebanon	17,7	17,5	17,2	17,6
Libya	22,4	22,2	22,3	23,2
Morocco	19,2	19,1	19,0	19,4
Syria	18,2	18,1	18,0	18,5
Tunisia	20,0	20,1	19,9	20,9
Turkey	12,2	12,1	12,2	12,4

Although the last period includes 19 years only, it is very striking to observe that the average temperature is higher in the recent period than in any other periods in the past. For example, compared to the 1960-89 period, the temperature increase in the last period reached 1°C for

Tunisia, 0.9°C in Libya, 0.8°C in Egypt, 0.6°C in Algeria, 0.5°C in Syria and 0.4 in Morocco and Lebanon. These rises are considerable for such a small period of time.

All these stylized facts reinforce the suspicion that the global warming process has already started in MENA countries. However, further investigation is needed in order to check whether this hypothesis can be confirmed econometrically.

b) The econometric analysis of global warming in MENA countries

This section develops an econometric modeling and several sets of tests about global warming at country level. In a first step, a standard OLS linear regression is estimated with the variable "temperature" as the dependent variable and the variable "year" as the independent variable all over the period (1900-2008). This makes it possible to check whether the hypothesis of "global warming is accepted all over the period considered.

Estimation results are presented in Table 2. It shows a positive and significant parameter estimate for Algeria, Tunisia, Libya, Egypt and Turkey to a lesser extent. As a result, global warming occurred all over the period for these countries. In the case of North African countries, this result is not surprising since we have seen that moving average temperatures in these countries greatly increased in the 70s after a certain stability (or a small rise) before. With regard to Turkey, the positive parameter estimate reflects the slight temperature increase all over the period in spite of great yearly volatility.

Conversely, the coefficient is negative and statistically significant for Lebanon and insignificant for the other countries. This can be explained because these countries have experienced several periods with different temperature variation, i.e. a rise in the beginning of the century, a decrease in the middle of the century and again a rise from the 70s onward. Hence, the global warming hypothesis is not supported for these countries during the whole period

Table 2: Estimation results for the whole period at country level (1900-2008)

	parameter est.	t-stat	constant
Algeria	0,004935***	3,81	13,561
Egypt	0,005067***	3,53	12,243
Israel	-0,000505	-0,36	20,931
Jordan	0,000177	0,12	18,987
Lebanon	-0,00326**	-2,08	23,853
Libya	0.00699***	5.03	8.803
Morocco	0,001691	1,39	15,846
Syria	0,000670	0,41	16,861
Tunisia	0,007341***	4,69	5,804
Turkey	0,002173*	1,69	7,958

* Significant at 10% level; ** Significant at 5% level; ***Significant at 1% level

However, even if the coefficient related to the independent variable is insignificant (or even negative), it is possible that there is a global warming in the recent period only. In this case, the Chow test makes it possible to check the stability of the parameter estimate and to derive the year from which there is a break in the series (structural change)[6]. Table 3 shows the F-statistics corresponding to the Chow test. The choice of the threshold year has been made according to this statistics. In case the statistics was significant for several contiguous years, the year chosen corresponded to the maximum F-stat. Table 3 clearly shows that almost all MENA countries have experienced a structural temperature increase, except Turkey for which the test, though positive, is insignificant. It is also worth mentioning that the global warming process generally started in the early seventies.

These results are complemented with two linear regressions, one before the structural change and one after (Table 3). The comparison of the parameter estimates before and after that threshold makes it possible to test to what extent global warming has occurred since this threshold year. Table 3 shows no evidence of climate change before the threshold year. One exception is Lebanon, which has experienced a temperature decrease before the structural change. However, all countries clearly

[6] Alternative statistics have been implemented in order to test the parameter stability of the model. In particular, the basic cusum test (Brown et al. 1975) is based on the cumulative sum of the recursive residuals Wt. As long as the parameter estimates b are constant, the mean of Wt is equal to zero. Conversely, the more b is varying, the higher the mean of Wt and the more likely Wt departs from the line corresponding to the zero likelihood. This test is generally used in order to detect a structural instability of b. A related test (cusum squared test) is based on the sum of the squares of the recursive residuals. It is more appropriate to detect random changes of the coefficients. In the present research, the basic cusum test seems to be more appropriate since we are interested in detecting structural changes of the parameter estimates. However, since climate data also have a random component (especially within a short period), the cusum squared test is also useful. The results of the Cusum tests are presented in Annex 1. It can be observed that these tests are not very sensitive and thus they hardly show evidence of any structural change in the air temperature of MENA countries, except in Algeria, Egypt, Morocco and Tunisia (cusum squared). Since the Chow tests are more sensitive to time series changes, these tests have been preferred in this analysis.

face global warming after the structural change (except Turkey for which the global warming occurs all along the period).

To sum up, the econometric analysis clearly shows that almost all MENA countries have experienced a significant rise in their air temperature, mainly since the early seventies. However, there are some differences across countries. These differences are interestingly summarized in Table 4, which shows the temperature change for each country before and after the structural change[7].

Table 3: Estimation of structural change

	Chow statistics	Structural change	parameter est. before	t-test before	parameter est. after	t-test after
Algeria	26,52***	1971	0,000374	0,19	0,04073***	7,77
Egypt	21,1***	1967	0,000270	0,1	0,04617***	5,24
Israel	7,3***	1971	0,001379	0,5	0,022174***	4,25
Jordan	7,9***	1982	-0,000136	-0,06	0,04557***	4,82
Lebanon	13,92***	1972	-0,006656**	-2,39	0,03297***	5,43
Libya	38,91***	1978	-0,004227**	-2,21	0,03879***	7,58
Morocco	15,05***	1971	-0,000392	-0,19	0,02411***	4,98
Syria	10,53***	1971	-0,002018	-0,69	0,03329***	4,73
Tunisia	39,4***	1971	0,001146	0,5	0,05631***	9,92
Turkey	2,25	1994	-0,000798	-0,37	0,00233	0,87

Again, several country groups can be distinguished. The first group includes North African countries, in particular Algeria, Tunisia, Libya and Egypt. These countries experience a clear increase in temperature average (from 0.3°C to 0.7°C) after the structural change. For these countries, the global warming process is the most evident, since such a rise in air temperature corresponds to a unique period over the 1900-2008 century. Climate warming is even more acute since 2000-2008 (+1.2°C for Tunisia; +1.0°C for Libya and +0.9°C for Algeria and Egypt). These countries are thus very much concerned with climate change.

Turkey is also characterized by a notable rise in air temperature (+0.4°C) even this rise does not corresponds to a structural change but a slight increase all over the period. As a result, the global

[7] Sensitivity analysis is presented in Annex 2. It takes several periods of time before and after the structural change (30 years, 20 years or 10 years). The results are fairly robust whatever the length of the time period before and after the structural change.

warming process is also clear for this country, even if it takes a different shape than in North African countries.

The last country group includes near-East countries (Israel, Jordan, Lebanon and Syria). The air temperature increase is much less straightforward since it is close to zero. The reason for this is that although these countries have all experienced a significant surge in air temperature after the structural change, this period is not unique during the century. It generally comes after temperature cooling in the previous years, which also comes after a period of warm temperature immediately before. This is why overall the rise in temperature in the recent period is real right after the structural change, but this rise is not so important over a longer period before.

Table 4: Global warming in MENA countries (°C)

	Average Temperature:		Change in temp.	Average Temperature:		Change in temp.
	before	after	(°C)	before	2000-2008	(°C)
Algeria	23,1	23,4	+0,3	23,1	24,0	+0,9
Egypt	22,0	22,3	+0,3	22,0	22,9	+0,9
Israel	19,9	19,8	-0,1	19,9	20,2	+0,3
Jordan	19,3	19,3	0,0	19,3	19,7	+0,4
Lebanon	17,3	17,3	0,0	17,3	17,9	+0,6
Libya	22,3	23,0	0,7	22,3	23,3	+1,0
Morocco	19,1	19,2	+0,1	19,1	19,6	+0,5
Syria	18,1	18,2	+0,1	18,1	18,7	+0,6
Tunisia	20,0	20,4	+0,4	20,0	21,2	+1,2
Turkey	12,1	12,5	+0,4	12,1	12,5	+0,4

Additional insights can be provided by checking all structural changes in MENA countries (Table 5). As expected, Near-East countries have experienced several opposite structural changes which can explain the special results for these countries.

Table 5: The various structural changes in MENA countries over the period 1900-2008

	Chow Statistics	Structural change	Temp. Var. from that year
Algeria	26,52***	1971	increase
Egypt	21,1***	1967	increase
Israel		1914	increase
		1938	decrease
		1964	decrease
	7,3***	1971	increase
Jordan		1913	increase
		1971	decrease
	7,9***	1982	increase
Lebanon		1942	decrease
		1959	decrease
	13,92***	1972	increase
Libya	38,9***	1978	increase
Morocco		1965	decrease
	15,05***	1971	increase
Syria		1967	decrease
	10,53***	1971	increase
Tunisia	39,4***	1971	increase
Turkey	*2,25*	*1994*	*increase*

As a first conclusion, the main results found so far is that:

- All MENA countries have experienced a rise in air temperature in recent years, mainly since the 70s

- This rise is important and generally started in the 70s which is a unique structural change in North African countries, especially Algeria, Tunisia, Libya and Egypt. In this regard, the temperature increase amounts to 0.3 or 0.7°C after the structural change. This increase is even much more important by taking the last decade (2000-2008): +1.2°C for Tunisia; +1.0% for Libya, +0.9°C for Algeria and Egypt. These countries are particularly concerned with global warming.

- Turkey is also concerned by global warming which is characterized by a slight long run process all over the period (with no structural change). The rise in the average temperature amounts to 0.4°C in recent years.

- Although Near-East countries are characterized by a recent structural change in their temperature, this structural change is not unique over the 1900-2008 period. As a result, there is less evidence of global warming comparing before and after the structural change. Nevertheless, these countries also face a notable temperature increase in very recent years (i.e. +0.5°C in 2000-2008 compared with that before the structural change).

Now one question is to know whether these past trends will continue in the coming years. The answer to this question goes far beyond the scope of this report since it requires specific time series econometrics in order to determine the time series properties of temperature. The presence of a deterministic trend could be interpreted as an evidence for a long run, human induced, global warming process. In contrast, under a stochastic trend, the recent warming trend could be interpreted as part of natural variations which should not be expected to continue in the long term. This question is still debated in the literature (see for example Kaufman et al., 2010) and will not be addressed here. In this report, we do not focus on forecasts but rather on the impact of present and past trends in temperature on the economic activity of MENA countries.

c) Results at a detailed geographical level

This subsection provides detailed results for each geographical cell (1 degree latitude and longitude resolution). The linear regression described previously is now carried out for each cell in each country. Annex 2 presents the detailed results of the regressions after the structural change. These results are summarized in Table 5, which shows the percentage cells in each country for which the parameter estimate is significantly positive, negative or insignificant. This gives interesting insights into the geographical areas where a recent structural change has taken place.

Interestingly, this table shows that except in Turkey, the great bulk of geographical cells show significant and positive parameter estimates. This confirms the hypothesis of air temperature increase after the structural changed at a detailed geographical level. In particular, Tunisia, Syria and Lebanon exhibit 100% of their territory with a significant rise in temperature after the structural change. This percentage exceeds 95% in Algeria and Egypt. It is more than 90% in Jordan, Libya and Morocco and almost 90% in Israel. For all these countries, there is no cell for which the parameter is significantly negative. One notable exception is Turkey, for which 82% of the cells regressions are statistically

insignificant. This result correlates that found previously at country level which showed the absence of structural change in Turkey.

Table 5: Summary of the estimation results at geographical level:

(% of the regressions which show positive, insignificant or negative coefficient)

	Temperature increase	Temperature constant	Temperature decrease	total nb of cells
Algeria	96,1%	3,9%	0,0%	255
Egypt	99,9%	0,1%	0,0%	106
Israel	88,9%	11,1%	0,0%	10
Jordan	94,2%	5,8%	0,0%	17
Lebanon	100,0%	0,0%	0,0%	4
Libya	92,3%	7,7%	0,0%	170
Morocco	92,6%	7,4%	0,0%	81
Syria	100,0%	0,0%	0,0%	33
Tunisia	100,0%	0,0%	0,0%	30
Turkey	13,7%	82,4%	3,9%	102
TOTAL	**87,8%**	**11,8%**	**0,4%**	**808**

Significance threshold of the parameter estimates: 5% or less.

Complementary results are given in Figure 3, which shows the temperature increase (in °C) after the structural change (compared to the 30 year period before)[8].

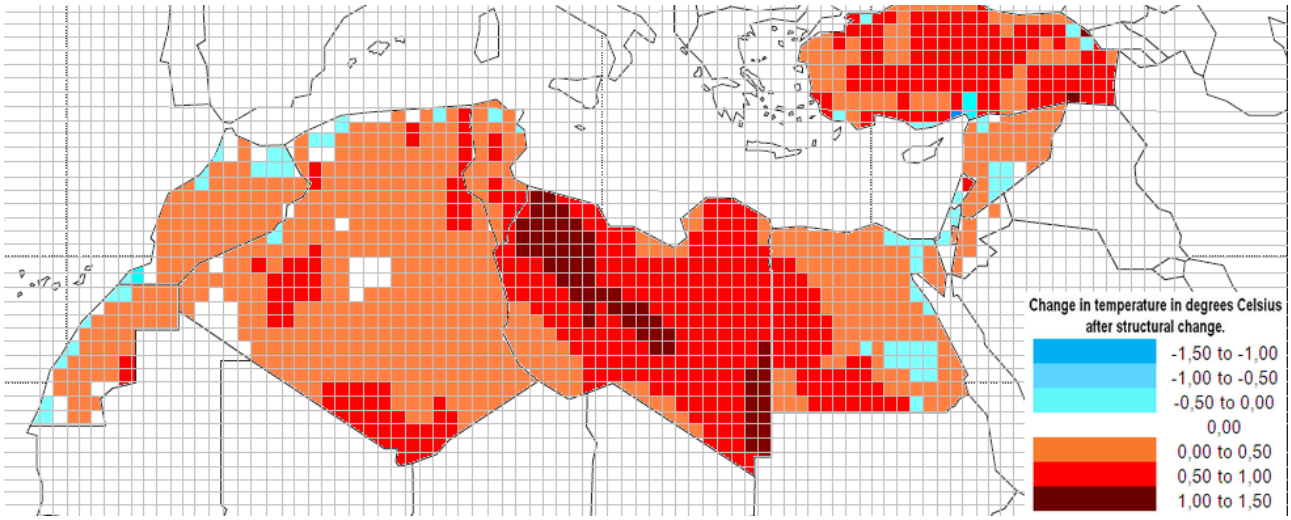
Detailed results and sensitivity analysis is presented in Annex 2. It takes several periods of time before and after the structural change (30 years, 20 years or 10 years). The results are fairly robust whatever the length of the time period before and after the structural change.

Results unambiguously show that North African countries are particularly concerned with global warming.

As a final test, we compare the temperature in the recent period (2000-2008) with the period before the structural change. This exercise is of particular interest since the recent period is recognized by climatologists as the warmest decade for a very long time. This makes it possible to calculate the climate change by using this reference period.

[8] We remind the reader that the 30 year period is generally recognized by climatologists as the right period to define a climate in a given area.

Figure 3: Temperature change after the structural change



(Reference period: the 30 years before the structural change)

d) An alternative variable for climate change: rainfalls

This last sub-section aims to check whether there is additional evidence of climate change in Mediterranean countries. For that purpose, data concerning precipitations are available in the same database as for temperature.

Figure 4: Moving average rainfalls in MENA countries (mm, 1900-2008, 10 years period)

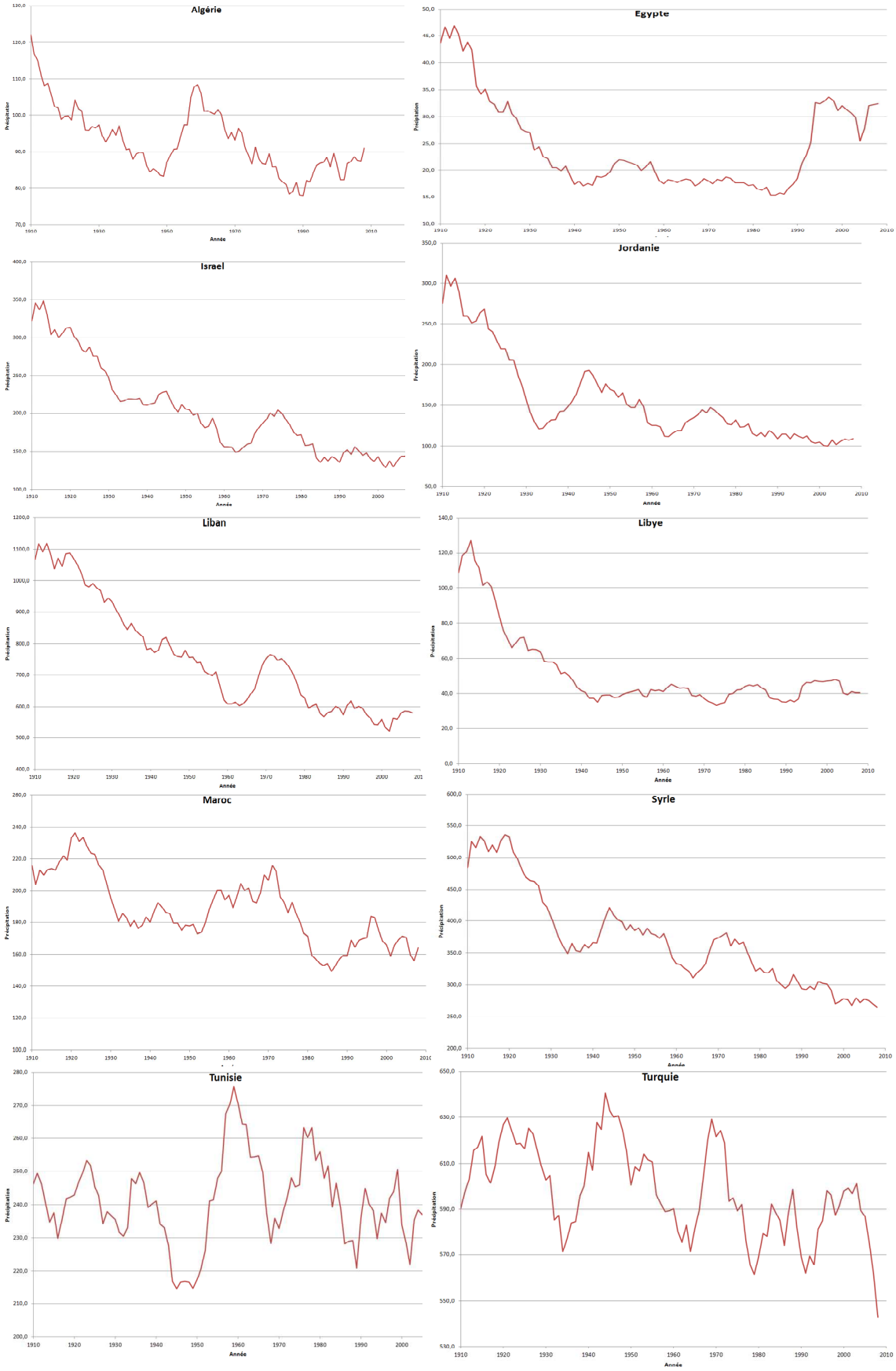


Figure 4 shows that average precipitations have generally fell down in Mediterranean countries. This reduction in precipitations is particularly acute for Mashrek countries. Table

6 highlights this result more precisely by showing a dramatic reduction in rainfall over the successive 30 year periods. Indeed, comparing rainfalls in 1900-1929 on the one hand and 1990-2008 on the other hand, it is striking to observe that precipitations have been halved in Mashrek countries, except Egypt. Maghreb countries and Turkey have experienced a much less dramatic decrease in rainfalls.

Table 6: Annual rainfalls for 30 years periods (mm)

	1900-29	1930-59	1960-89	1990-2008	variation (%)
Algeria	108,5	94,2	86,7	89,1	-17,9%
Egypt	36,3	19,5	17,7	33,1	-8,8%
Israel	298,2	195,0	164,5	145,9	-51,1%
Jordan	238,9	149,6	124,9	108,3	-54,7%
Lebanon	1035,0	727,2	654,1	568,0	-45,1%
Libya	85,9	41,1	39,0	43,3	-49,6%
Morocco	215,4	185,3	180,9	186,9	-13,2%
Syria	479,3	364,8	332,9	272,0	-43,3%
Tunisia	242,1	243,5	236,7	241,8	-0,1%
Turkey	606,0	601,5	590,9	570,9	-5,8%

The econometric tests are performed in the same way as for temperature. Indeed, in a first step, a standard OLS linear regression is estimated with the variable “rainfalls” as the dependent variable and the variable “year” as the independent variable all over the period (1900-2008). This makes it possible to check whether the hypothesis of “”climate change” is accepted all over the period considered with regards to precipitations. Results presented in Table 7 indicate that all parameter estimates are greatly significant, except for Tunisia. This suggests that all the other countries has experienced a significant decrease in rainfall over the last century

Table 7: Estimation results for the whole period at country level (1900-2008)

	parameter est.	t-stat	constant
Algeria	-0,26995***	-4,47	622,66
Egypt	-0,10677***	-2,38	234,68
Israel	-1,85259***	-9,61	3826,40
Jordan	-1,57062***	-7,86	3228,98
Lebanon	-5,44663***	-11,07	11406,75
Libya	-0,43409***	-5,13	901,40
Morocco	-0,55439***	-4,52	1272,45
Syria	-2,29282***	-8,72	4851,52
Tunisia	-0,03192	-0,22	303,32
Turkey	-0,40379**	-2,11	1383,49

In addition, calculations of Chow tests indicate that the main structural change concerning rainfalls, if any, generally occur much earlier than the rise in temperature. In other words, most time series show a continuous declining trend of rainfalls, especially for Mashrek countries. But when structural changes occur, it is as early as 1914 (Algeria), 1922 (Jordan and Syria), 1931 (Libya) or 1935 (Egypt).

Table 8: The various structural changes in MENA countries over the period 1900-2008

	Chow Statistics	Structural change	Temp. Var. from that year
Algeria	11,7***	1914	decrease
		1941	increase
		1950	decrease
Egypt	21,21***	1935	decrease
		1950	decrease
Israel	7,9***	1963	decrease
Jordan	14,1***	1922	decrease
Lebanon	8,40***	1963	decrease
Libya	24,2***	1931	decrease
Morocco	No SC		
Syria	39,39***	1922	decrease
Tunisia	No SC		
Turkey	No SC		

Results at a micro-spatial level (Table 9 and Figure 5) correlate the results at country level by showing that most regions in Mashrek countries have experienced a dramatic decrease in precipitations in the past century. In particular, 100% of the regions in Israel, Jordan and Lebanon have faced a significant decrease in rainfalls between the period 1900-1929 and 1990-2008. This is also the case for about 94% of the Syrian regions. The results are intermediate in Egypt, Algeria and Morocco for which the number of regions showing a decrease in precipitation is ranged between

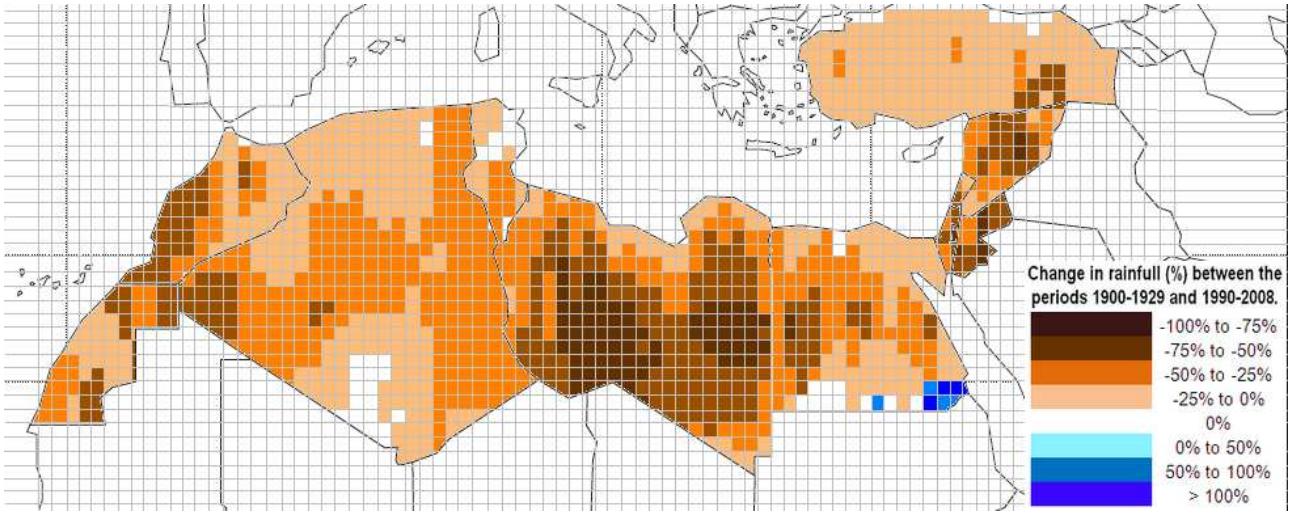
63% and 80%. Tunisia and Turkey are less concerned by the reduction in rainfall since it concerns less than 25% of their total number of regions.

Table 9: Summary of the estimation results at geographical level:

(% of the regressions which show positive, insignificant or negative coefficient)

	Precipitation increase	Precipitation constant	Precipitation decrease	total nb of cells
Algeria	0,0%	27,8%	72,2%	255
Egypt	4,8%	32,1%	63,2%	106
Israel	0,0%	0,0%	100,0%	10
Jordan	0,0%	0,0%	100,0%	17
Lebanon	0,0%	0,0%	100,0%	4
Libya	0,0%	10,0%	90,0%	170
Morocco	0,0%	19,8%	80,2%	81
Syria	0,0%	6,1%	93,9%	33
Tunisia	0,0%	80,0%	20,0%	30
Turkey	0,0%	76,5%	24,5%	102
TOTAL	**0,6%**	**30,0%**	**69,4%**	**808**

Figure 5: Change in precipitations in the last century (%)



The conclusion of this section is the following:

- Mediterranean countries have experienced a dramatic climate change over the past century, both in terms of temperature increase and fall in precipitation.

- Maghreb countries have been more concerned by global warming, which generally occurred from the early 70s. The rise in temperature after this structural change is about +0.3/°0.4 degrees Celsius for these countries. In addition, global warming has accelerated in the early 2000s (+0.9/+1.2°) as compared to the period before the structural change. Global warming also concerned Mashrek countries, although to a lesser extent (+0.3/+0.6 °C).

- The decrease in rainfalls is also very significant. It mainly concerns Mashrek countries. In addition, this process started earlier than global warming (often before the 1930s). In the most recent period (1990-2008), annual average rainfalls in Mashrek countries and Libya reached only 50% those recorded in the period (1900-1929). Conversely, the reduction in precipitations is much less dramatic in most Maghreb countries and Turkey (-8/-17%).

These results complement the literature review developed in the first part of this study. They show that the climate change process has already started in MENA countries. This makes the prediction of future climate change even more reliable.

Section Two: The Impact of Climate Change on Growth in MENA countries: A Micro-spatial Analysis

a) Analysis at micro-spatial level

The analysis proposed here combines the micro-spatial database used in the previous section concerning temperature and precipitations with another micro-spatial database related to GDP (and population). This new dataset has been developed in the framework of the G-Econ research project (Yale University), which is devoted to developing a geophysical based data set on economic activity for the world. The current data set (GEcon 3.3) is now publicly available and covers "gross cell product" for all regions, which includes 27,500 terrestrial grid cells for four years (1990, 1995, 2000, and 2005). The basic metric is the regional equivalent of gross domestic product. Gross cell product (GCP) is measured at a 1-degree longitude by 1-degree latitude resolution at a global scale. The advantage of this dataset is that the geographical units (approximately 100 km by 100 km) is somewhat smaller than the size of the major sub-national political entities for most large countries and approximately the same size as the second level political entities in most countries, e.g., departments in France (for all details, refer to http://gecon.yale.edu/).

Combining available data on GDP, population, temperature and precipitations makes it possible to develop a first set of models at a detailed geographical level. It covers the 808 regions in the Mediterranean countries selected previously. Several models can be estimated, i.e. in cross-sections, time series or panel.

Cross-sectional estimations makes it possible to assess to what extent countries with higher temperature or lower precipitation also show lower GDP, GDP per capita or growth.

The basic model to be estimated is of the following type (see for example Dell et al., 2009). The full conception framework is described in Annex 4.

$$LOGY_r = a_1 TEMP_r + a_2 RAIN_r + a_3 X_r + \varepsilon_{rt} \qquad (1)$$

Where Y_r reflects the income (or income per capita) of each region r, *TEMP* and *RAIN* respectively denote temperature and rainfalls for each region, X is a set of geographic control variables, such as elevation, coast and slope.

The estimation of equation (1) makes it possible to appraise the effects of an increase in the temperature by 1°C or the decrease in rainfall by 1mm on the income across countries or regions. This provides a first insight into the effects of global warming observed in the previous section for MENA countries.

Results at cross-section level are presented in Table 9 with GDP as the dependent variable[9]. Data correspond to the yearly average for the period 1990-2008. The OLS estimator is implemented first. Taking all the micro-regions into account (808 geographical areas), the temperature and precipitations variables are greatly significant (1% level). Indeed, a rise in the temperature and a decrease in the precipitation have a detrimental impact of GDP. This means that at cross-region level, the area with lower temperature and higher precipitations also have greater GDP. This is a first indication about the influence of climate on GDP.

Looking at results for each country, it is striking to observe that the impact of temperature is very significant for Maghreb countries, but much less in Mashrek countries, except Egypt. In this regard, the low number of observations for Mashrek countries can explain this difference. In addition, we have concluded in section 1 that Maghreb countries have been much more concerned by global warming than Mashrek countries. As a result, it may be that Maghreb countries are more harmed by global warming in terms of GDP than the other countries. Conversely, Mashrek countries have been more concerned by the decrease in rainfalls in the past century. This may explain that GDP in these countries is generally more sensitive to precipitations than they are in Maghreb countries.

Table 9: Results in cross section with GDP as the dependent variable (OLS)

[9] The final estimations disregards the effects of control variables like slope or elevation, since the climate database provides data which are already corrected for these variables.

	All areas	Algeria	Egypt	Israel	Jordan
Temperature	-0.2467***	-0.3073***	-0.4696***	-0.3575	-0.0616
Precipitations	0.0021***	0.0019**	0.0099	0.0669*	0.0147***
Intercept	22.81***	24.01***	27.87***	28.53***	17.84***
Moran I test	*0.4513****	*0.4773****	*0.4451****	*0.0484****	*0.0194*
obs	808	255	106	9	17
R-squared (adj.)	0.25	0.32	0.10	0.31	0.38

	Lebanon	Libya	Morocco	Syria	Tunisia	Turkey
Temperature	-0.0001	-0.4632***	-0.2312***	-0.0427	-0.3263***	-0.0947
Precipitations	0.0001	0.0558***	0.0011	0.0227*	0.0004	0.0012
Intercept	0.01	27.89***	21.84***	19.57***	26.28***	20.27***
Moran I test	*n.a.*	*0.2980****	*0.4180****	*0.1097****	*0.1272****	*0.3405****
obs	4	171	81	33	30	102
R-squared (adj.)	0.10	0.36	0.58	0.06	0.11	0.06

A complementary analysis is provided by Table 10 with a cross sectional regression using GDP per capita as the dependent variable. Parameter estimates show the same sign as previously but are much less significant. In fact, temperature only plays a role for explaining GDP per capita, but in four countries only which are all in North Africa.

This difference in the results can be explained by the role of population. Indeed, if GDP is smaller in warmer and drier areas, it may be due to the fact that these areas are less populated. To sum up, regions with higher temperature show lower GDP but not necessarily lower GDP per capita. Still, in almost all North African countries, a rise in cross-region temperature leads to a decrease in GDP per capita, which is an indication about the impact of climate on the real economy. In the case of Mashrek countries, the smaller number of observations may also explains that results are less significant.

Table 10: Results in cross section with GDP per capita as the dependent variable

	All areas	Algeria	Egypt	Israel	Jordan
Temperature	-0.0810**	-0.0196**	-0.1750***	-0.0001	-0.0001*
Precipitations	0.002	0.0017	0.0039	0.0001	0.0001
Intercept	7,95***	8.24***	11.17***	28.53***	7.61***
Moran I test	*0.5378****	*0.1992****	*0.4451****	*-0.2281*	*0.1207**
obs	808	255	106	9	17
R-squared (adj.)	0.05	0.07	0.08	0.01	0.09

	Lebanon	Libya	Morocco	Syria	Tunisia	Turkey
Temperature	-0.0001	-0.0281**	-0.0195***	-0.0001	-0.0001	-0.0001
Precipitations	0.0001	0.0002	0.0011	0.0002	0.0001	0.0002
Intercept	0.01	9.40***	7.55***	6.85***	7.73***	7.54***
Moran I test	n.a.	0.3029***	0.4387***	*-0.1157*	*-0.1612*	0.7687***
obs	4	171	81	33	30	102
R-squared (adj.)	0.01	0.05	0.14	0.01	0.02	0.03

These results may be interestingly compared to those obtained in Dell et al. (2009). Using the same methodology (cross-sectional regression over the same variables) at worldwide level, these authors show that the parameter estimate for temperature is equal to "-0.085". This means that taking the world average, the rise in temperature by 1°C leads to a decrease in the GDP per capita by 8.5%. Interestingly, the parameter estimates in the present study vary between -0.17 for Egypt to zero in Turkey, Tunisia and some Mashrek countries. Thus, -0.085 is exactly in the middle of this range. In the same way, the Dell et al. study indicates that the parameter corresponding to precipitations is insignificant. This is also the case in MENA countries in the present research.

Another interesting result in Tables 9 and 10 is the value of the Moran I test for spatial autocorrelation. In most cases, this test is significant at 1% level. This suggests that the error terms are spatially correlated in the model. As a result, the regional GDP cannot be considered as spatially independent.

In order to take the spatial correlation of the error terms, Table 11 proposes a spatial lag regression model which takes the following form:

$$Y=\rho W_y+X\beta+\varepsilon$$

Where Y is the GDP (or GDP per capita), Wy is the lagged endogenous variable with the spatial weight matrix W and ρ is the autoregressive spatial parameter which measures the intensity of the spatial interactions across the regional GDPs. Finally, X corresponds to the

other variables, i.e. temperature and precipitations (for additional details, refer for instance to Le Gallo, 2002).

Table 11a: Estimations with spatial lag regression model

(GDP as the dependent variable)

	All areas	Algeria	Egypt	Israel	Libya	Morocco	Turkey
Temperature	-0.0803***	-0.1116***	-0.1974**	-0.3233***	-0.1976***	-0.1052***	0.0346
Precipitations	-0.0003	-0.0002	-0.0008	0.0025*	0.0013	0.0007	-0.0008
Intercept	5.3705***	6.1103***	27.9521***	14.1877***	10.2190***	5.3637***	6.1924***
Rho	*0.7944****	*0.8016****	*0.7247****	*0.6341***	*0.6703****	0.8086***	*0.6965****
obs	808	255	106	9	17	81	102

Table 11b: Estimations with spatial lag regression model

(GDP per capita as the dependent variable)

	All areas	Algeria	Egypt	Israel	Libya	Morocco	Turkey
Temperature	-0.0005	-0.0026	-0.1446***	n.a.	-0.0143*	-0.0011**	0.0449
Precipitations	0.0004	-0.0002	0.0016*	n.a.	0.0005	0.0001	0.0001
Intercept	7.8244***	3.8680	10.3606***	n.a.	3.4725***	2.2512***	7.8075***
Rho	*0.7877****	*0.5054****	*0.4063****	n.a.	*0.6426****	0.8086***	*0.9193*
obs	808	255	106	9	17	81	102

Results in Table 11 are limited to countries which included a significant number of regions. As a result, estimations or Jordan, Lebanon, Syria and Tunisia are not presented. As compared to the standard cross-section analysis presented in Tables 9 and 10, the model with spatial lags provides parameter estimates of smaller magnitude. As a result, the parameter estimates corresponding to temperature and precipitations are less significant. In particular, the parameters corresponding to precipitations are almost all insignificant. The impact of temperature on GDP generally remains significant. However, the impact of temperature on GDP per capita is significant only in Egypt as well as Morocco and Libya to a lesser extent.

A second set of estimations rely on the convergence model, often called the Barro regression (Mankiw et al., 1992; Ramajo et al., 2008):

$$\Delta y_{it} = \frac{\log y_{it} - \log y_{it_0}}{T} = \alpha + \beta \log y_{it} + \gamma \log temp_{t_0} + \gamma \log prec_{t_0} + \varepsilon_{it}$$

In case of convergence, β is expected to be negative (the lower the initial GDPC in country i, the higher its growth rate, which suggests convergence).

Two estimations procedures are implemented: the spatial lag model as well as the spatial model with auto-correlated residuals: $Y=\beta X+\varepsilon$ with $\varepsilon=\lambda W_\varepsilon+u$ where X is the control variables (temperature and precipitations and W_ε is the spatial matrix of residuals.

Table 12: Estimations of the conditional convergence model (spatial lag model)

	GDP/cap	GDP
Initial GDP	-0.2337***	-0.0451***
Temperature	-0.3343***	-0.2859*
Precipitations	0.1292	1.7464
Intercept	2.6573***	4.3131***
Rho	*0.6869****	*0.8807****
obs	808	808

Results of the conditional convergence model with spatial lag indicate a convergence of GDP and GDP per capita between the 808 Mediterranean regions (the lagged GDP or GDP per capita variable is negative and statistically significant). In addition, the variable corresponding to temperature is also negative and significant. This result correlates our previous results by suggesting that any temperature increase is associated with a decrease in GDP and GDP per capita. However, the variable corresponding to precipitations is insignificant.

Unfortunately, results at country level are not always significant and even reliable because the too small number of observations combined with the fact that the initial income captures the major part of the variance in the estimation.

To sum up, the result of the cross-section analysis shows that:

- Using OLS, results show that any increase in temperature by 1°C leads to a decrease in GDP per capita which ranges between 17% in Egypt to 0% in, Turkey, Tunisia and some Mashrek countries. This range is very close to results at worldwide level which show that 1°C rise in temperature leads to a decrease in GDP per capita by 8.5% (Dell et al., 2009)

- The impact of the reduction in precipitations on GDP per capita is generally insignificant

- Taking spatial autocorrelation into account, there is still some evidence of a negative impact of temperature on GDP and GDP per capita to a lesser extent, especially in North African countries. Interestingly, these countries are those for which global warming has been the most significant (rise in temperature by about 1°C). For the other countries, the impact of temperature on GDP per capita is not significant but these countries are concerned by global warming to a lesser extent (rise in temperature below 0.5°). Overall, although significant, the impact of global warming on GDP per capita is limited: a rise in the temperature by 1°C leads to a reduction of GDP per capita by less than 5%, except Egypt (15%).

- The impact of the reduction in precipitations on GDP per capita remains generally insignificant.

- The limited impact of climate change on GDP per capita can be explained by several reasons:

    - The role of convergence. It can be shown that the convergence effect on GDP per capita can offset the impact of climate change (Dell, 2009)

    - Adaptation. The countries which face a climate change can adapt their economy (migration to more climate attractive areas, technical progress in agriculture, innovation and growth in other sectors)

    - Omitted variables. Working at a micro-spatial basis leads to a severe limitation of data. As a result, the model which explains GDP per capita by temperature and precipitations only is incomplete since it disregards crucial economic variables like education, human capital and innovation.

Additional estimations in panel data at micro-spatial level provide interesting results since it includes the time dimension and the spatial dimension of the model. Results show that generally both temperature and precipitation are significant to explain the growth process in MENA countries.

b) Analysis at macro-level

This last set of regressions is implemented at macro-level (country-level) in order to include a greater number of independent variables. In this case, the beta-conditional convergence regression includes additional variables to temperature and precipitations. The choice of these additional variables is guided empirically following the work of Barry (2003), Sala-i-Martin (2004) or Péridy and Bagoulla (2012). The first set of additional variable is related to human capital and technology. Indeed, it is expected that education and R&D are key variables which explain growth. Education is measured as the secondary schooling enrolment rate innovation is captured by the R&D/GDP ratio. For these two variables, the statistical source is World Development indicators (2008).

A second set of variables is related to international trade and the pattern of specialization. Following Amable (2000), two alternative variables are used to capture the impact of specialization on growth:

- Inter-industry specialization: $I_j = \frac{1}{2}\sum_i \left| \frac{X_{ij}}{X_{.j}} - \frac{M_{ij}}{M_{.j}} \right|$ with $0<I_j<1$

The higher I_j, the more trade balances are dissimilar across industries, and then the higher inter-industry trade (source: own calculations from UNCTAD, 2008, Handbook of Statistics)

- Trade dissimilarity: $A_j = \frac{1}{2}\sum_i \left| \frac{X_{ij}}{X_{.j}} - \frac{X_{i.}}{X_{..}} \right|$ with with $0<A_j<1$

The higher A_j, the less the export structure of country j matches international demand (the more trade is dissimilar). This is expected to negatively affect growth, since in this case, trade patterns of country j is at odds with that of international demand. (source: UNCTAD, 2008, Handbook of Statistics)

Communication, transport and infrastructure are also key variables for explaining growth. In this regard, we used two variables: i) roads paved as a percentage of total roads (source: WDI 2008); ii) telephone lines per 1000 inhabitants (Source: World Bank, Global Development Network Growth database).

The final variable is the share of government consumption in GDP (source: Heston et al. 2006). A negative sign is expected because public consumption is financed by distortionary taxes which reduce the growth rate.

The equation is estimated simultaneously for the seven MENA countries described above for the period 1961-2008. Preliminary estimations are driven with standard fixed effects (FEM) and random effect models (REM). However, given that preliminary Hausman tests on REM indicate the presence of endogeneity problems, the estimator finally selected is Hausman and Taylor (HT). It assumes that some of the explanatory variables are correlated with the individual-level (country i) random effect μ_i. This estimator has been increasingly used in the literature since Egger (2004). Several endogenous variables have been selected: roads, telephone as well as specialization. We used a feasible set of instruments, namely the deviation from group means of the time-varying variables, the time-invariant uncorrelated variables, as well as the time-varying uncorrelated variables group means (see detailed computation procedure in Greene, 2003, p.303-306).

As alternative estimators, we present the Baltagi-Wu (BW) GLS which assumes a panel autocorrelation of the residuals (Baltagi and Wu, 1999), as well as the GLS for heteroskedastic error structures (HGLS)[10]. The choice of these estimators complements the previous ones since they do not particularly focus on the endogeneity bias, but make it possible to correct other possible biases (heteroskedasticity and autocorrelation). Results are presented in Table 13.

Table 13: Estimation results with an enlarged set of explanatory variables.

[10] The other standard tests, such as LM, multicolinearity (VIF), omitted variables, etc… have been preliminary implemented and are available upon request.

	HT	BW GLS	HFGLS
initial income level (beta)	-0.026***	-0.026***	-0.034***
Climate Change			
Temperature	-0.0013*	-0.0039*	-0.0011*
Precipitation	0.0001**	0.0001**	0.0001**
Human Capital and Technology			
Education	0.0057**	0.0044**	0.0059**
R&D	0.037**	0.036**	0.047**
Trade, specialization and openness			
Inter-industry specialization (endogenous)	-0.015**	-0.015**	-0.013*
Dissimilarity	-0.023***	-0.022***	-0.022***
Transport and communication			
Road (endogenous)	0.0165***	0.0165***	0.0172***
Telephone (endogenous)	0.0018**	0.0018**	0.0020**
Other:			
government share in consumption	0.0008	0.0009	0.0006

Interestingly, both the temperature and the precipitation variables are significant and present the expected sign, although the temperature coefficient is significant at 10% level only. Still, these results correlate the previous ones and suggest that climate change has detrimental effects on growth in MENA countries.

Amongst the other key variables, education and R&D and infrastructure are significant and show the expected sign. In addition, the trade variables are also significant. As a matter of fact, the specialization variable is negative. This result can be explained by two reasons. The first is that the absence of intra-industry trade reveals the lack of product differentiation and scale economies. Following the new international economics (Krugman, 1995), this deprives MENA countries from important trade and growth gains related to product varieties and lower prices due to scale economies. A second and more important reason is that MENA countries generally specialize in low-value added products, i.e. textile and clothing, fuel products, basic chemicals or agriculture. This type of specialization is less growth creating than specialization in higher value added products (electronics, car industry, etc…). In addition, the trade dissimilarity variable is negative, which suggests that when the export structure of MENA countries poorly fits international demand, this is detrimental to growth.

As a conclusion, there is significant evidence that the climate change has a negative impact on GDP and GDP per capita in MENA countries. These results are in line with the predictions of the literature review developed in the first part of this study, which suggested that climate change would lead to significant losses in terms of GDP. The present section tends to show that these negative effects on GDP have already taken place.

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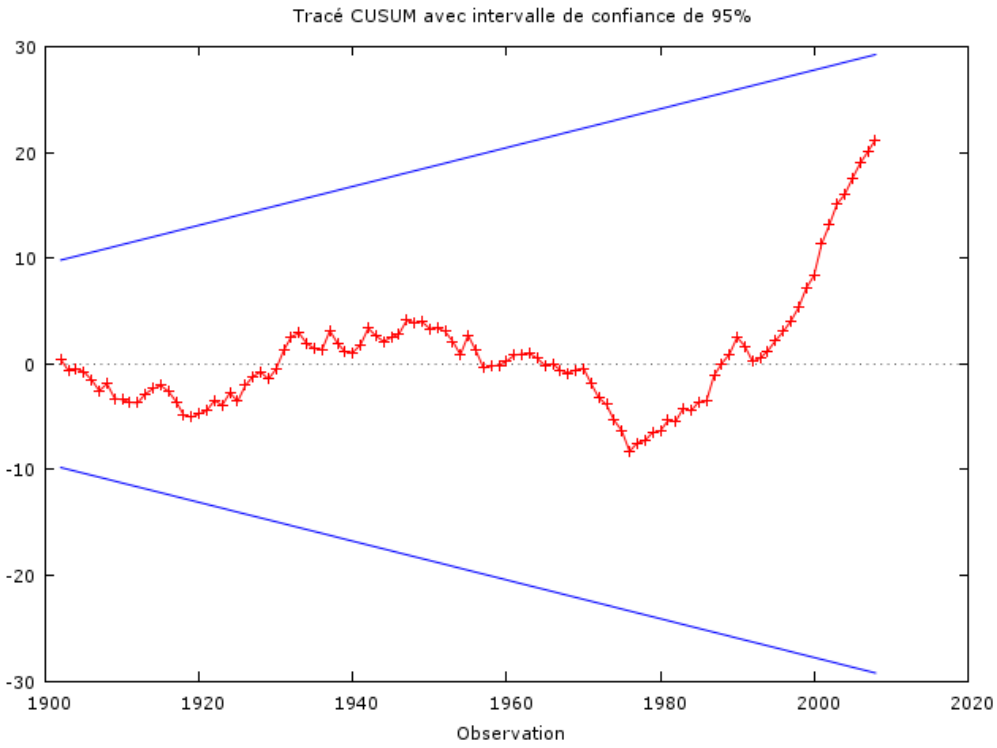
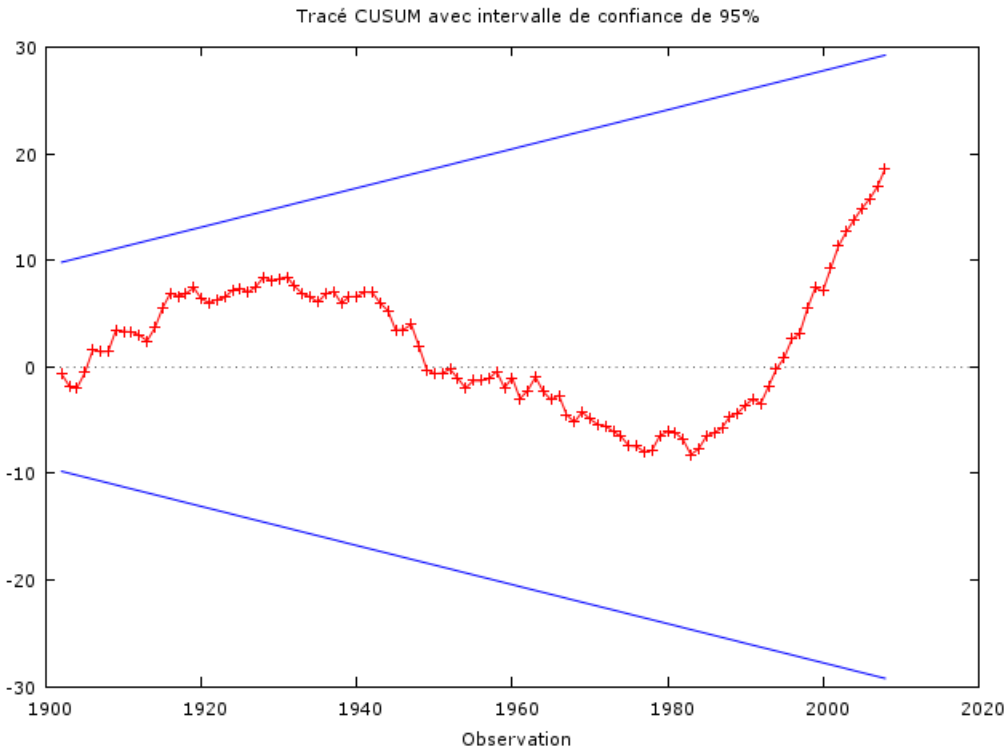
Annex 1: Results of the Cusum tests

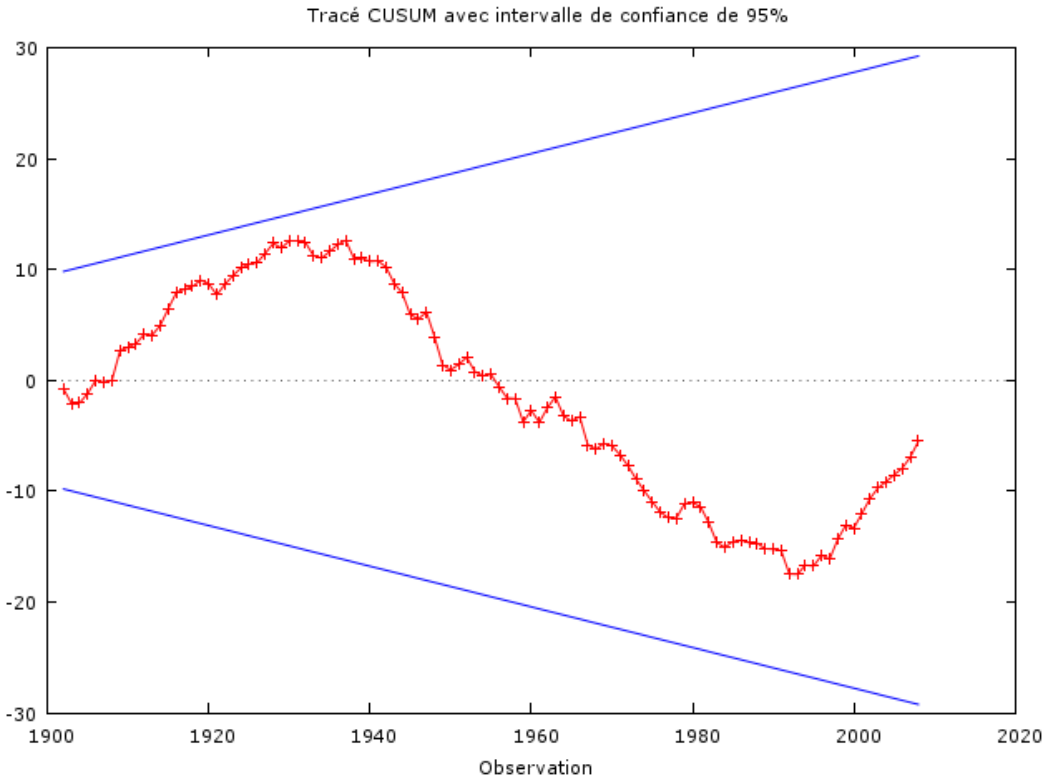
a) Algeria



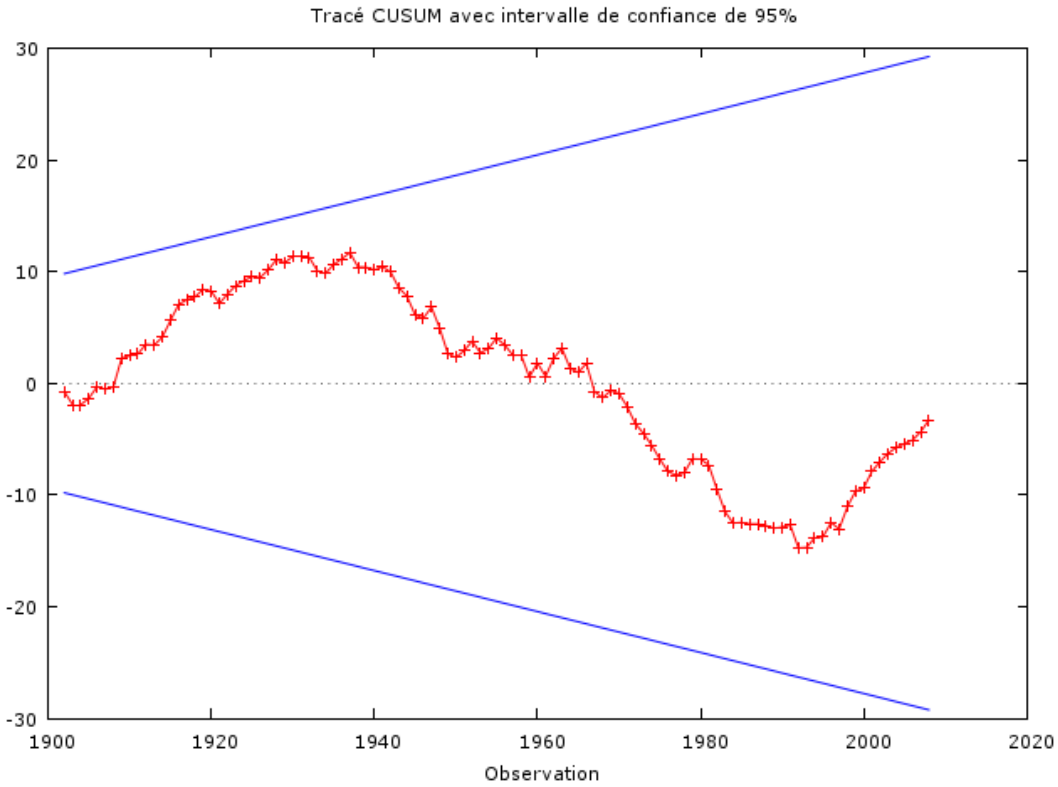
b) Egypt



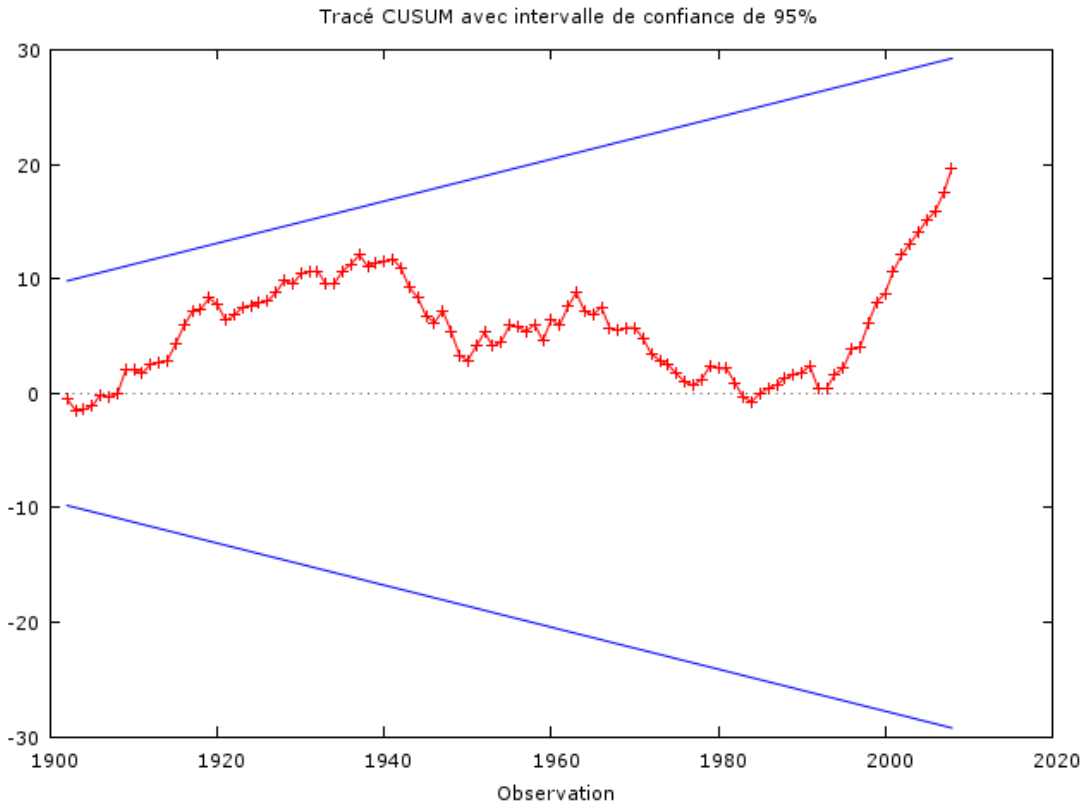
c) Israel



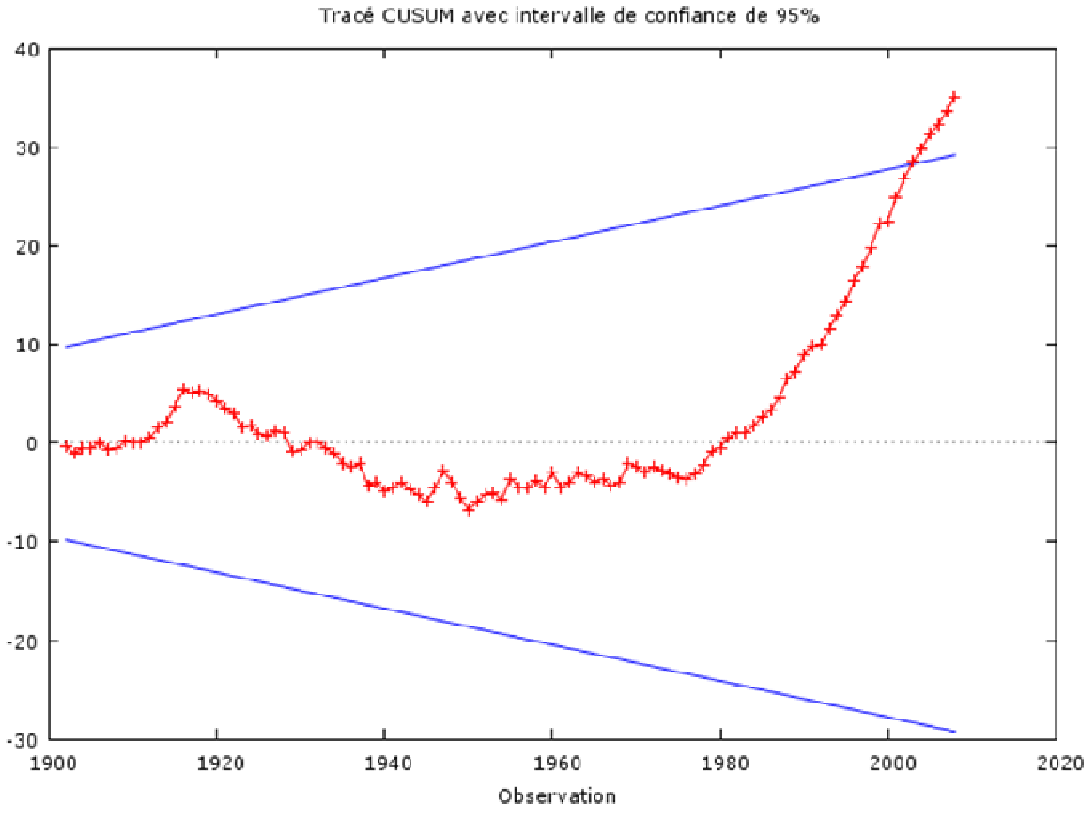
d) Jordan



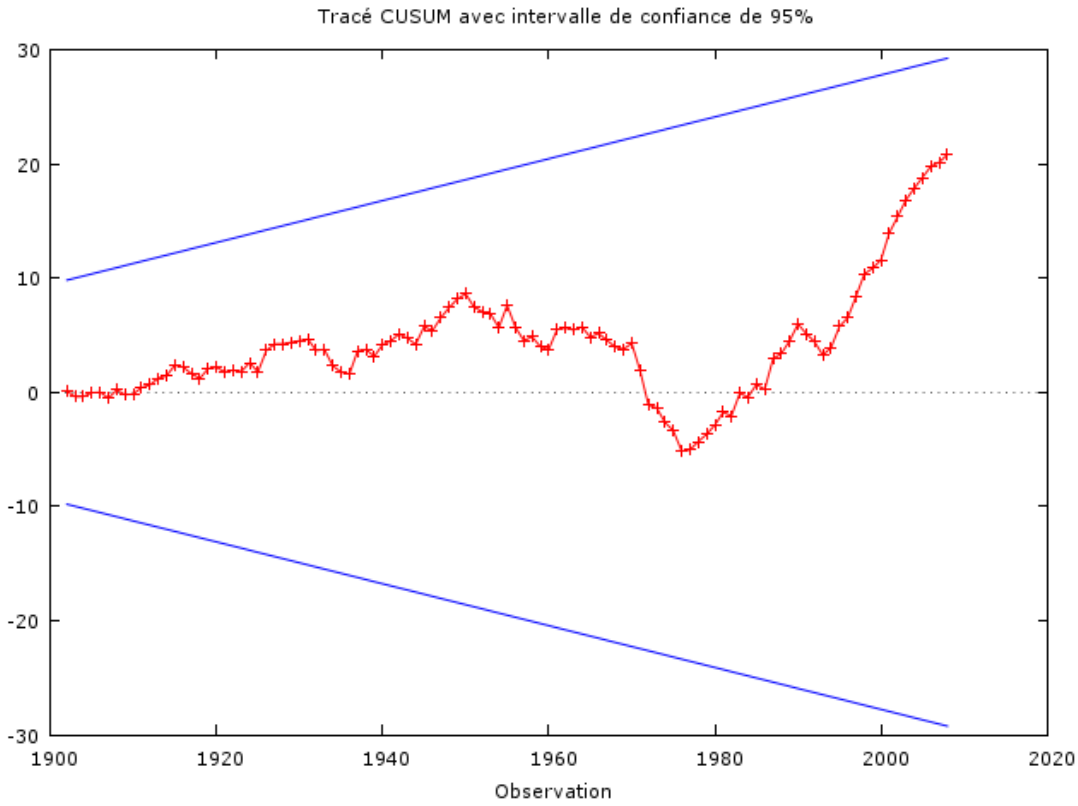
e) Lebanon



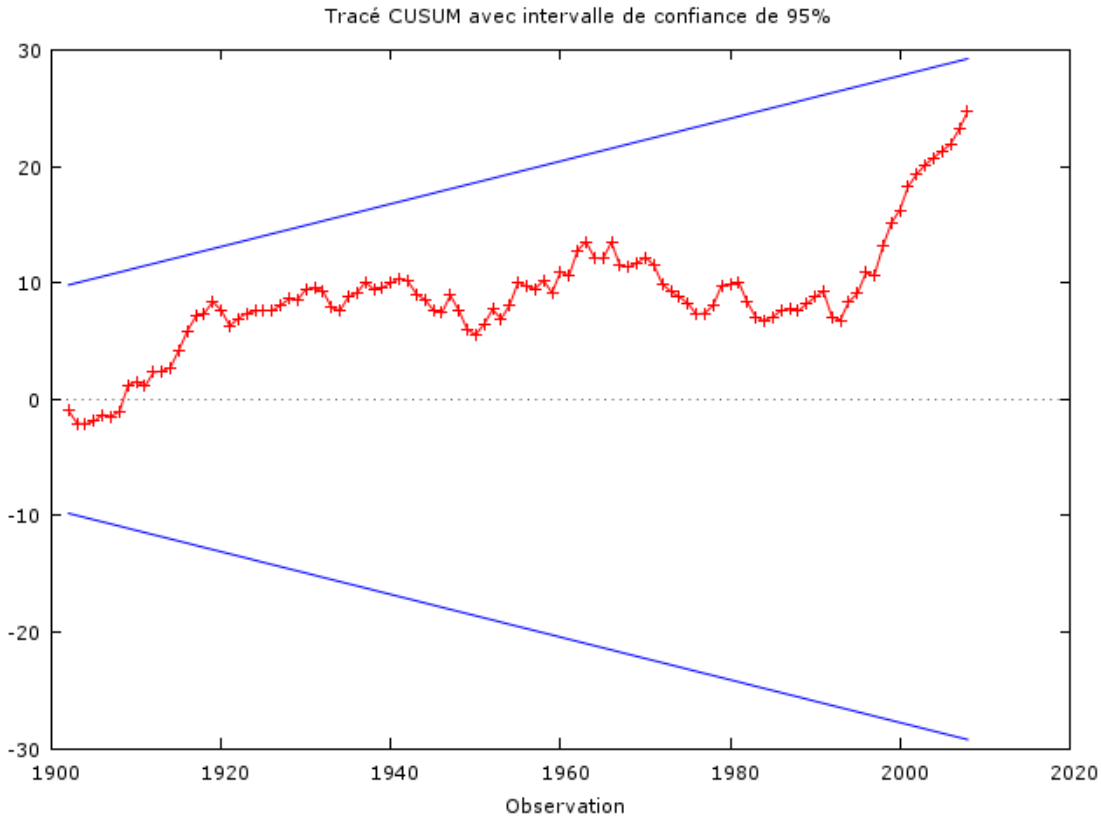
f) Libya



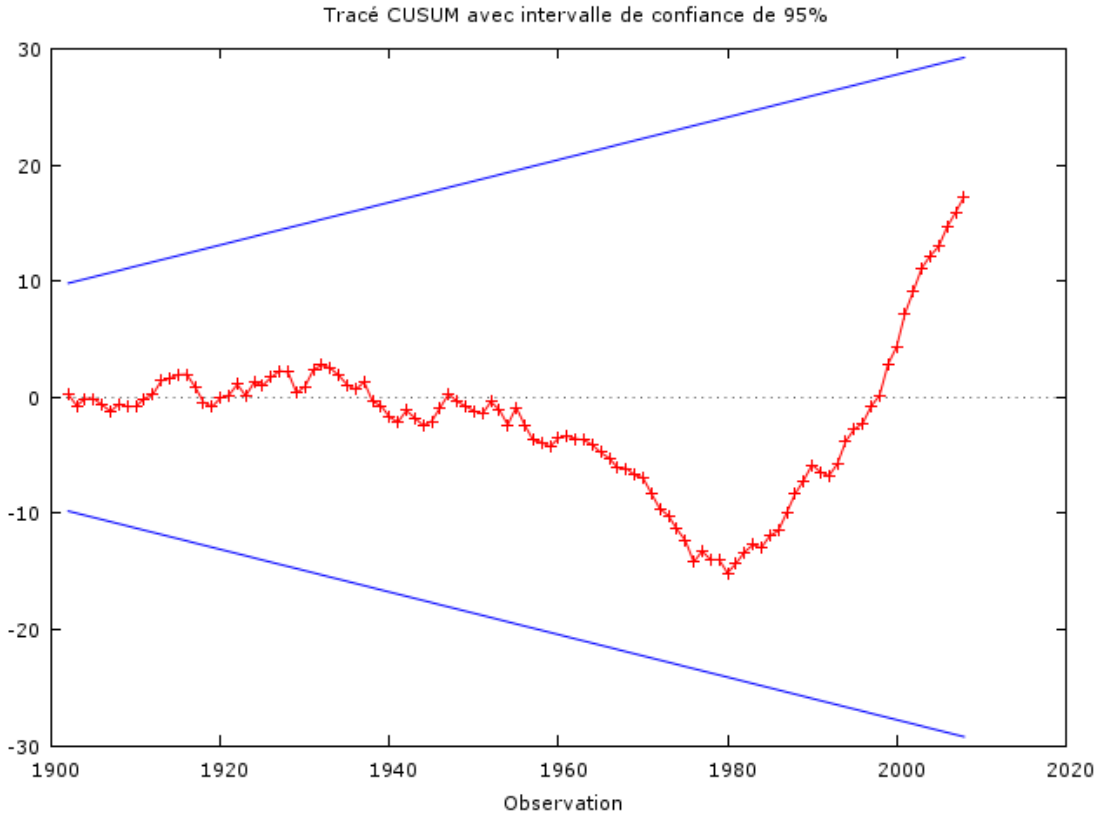
g) Morocco



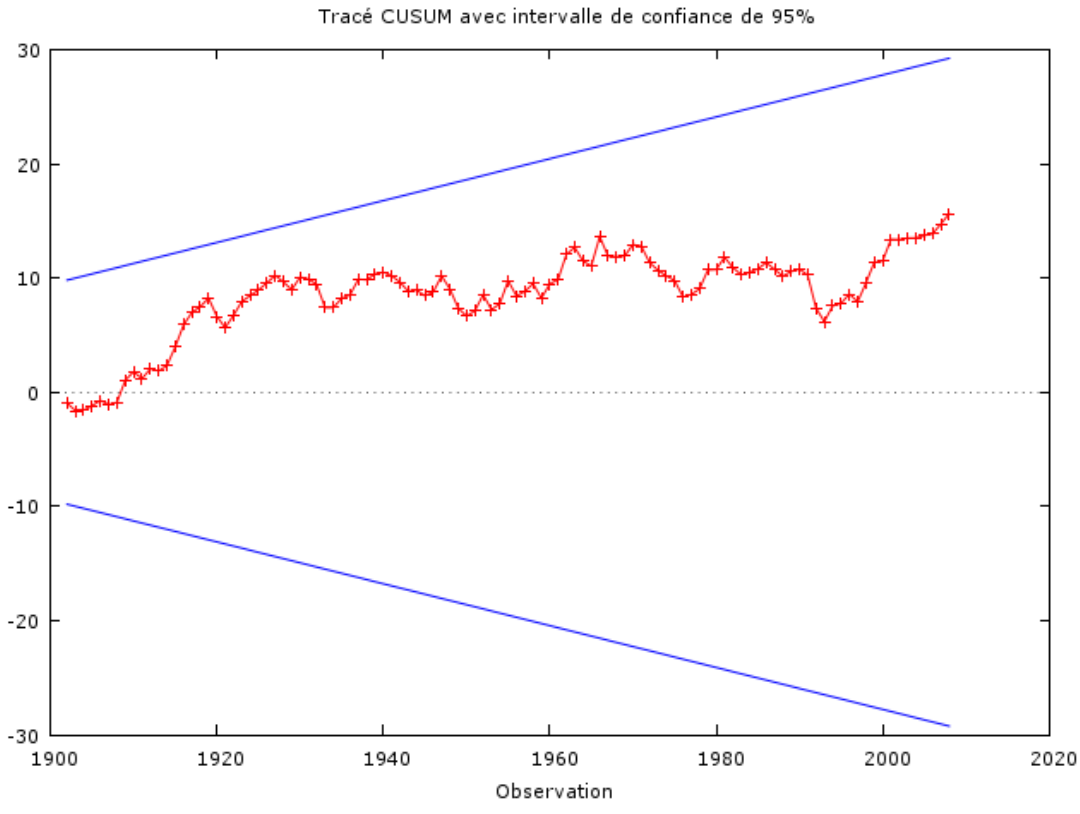
h) Syria



i) Tunisia

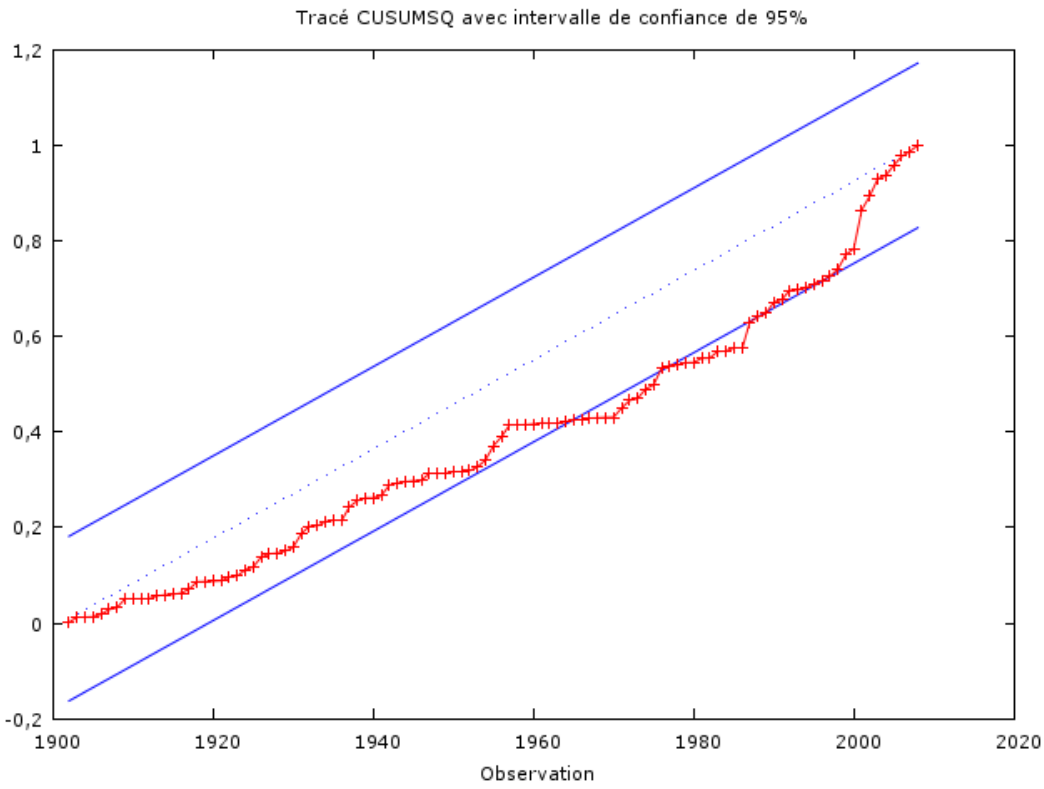


j) Turkey

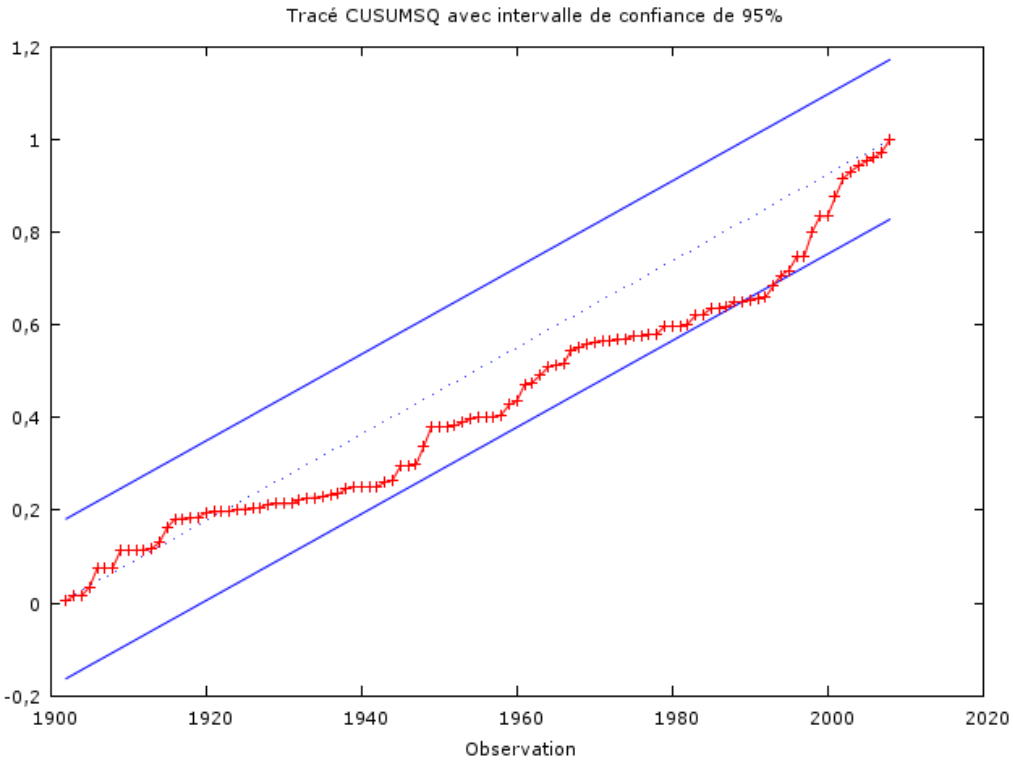


Annex 2: Results of the Cusum squared tests

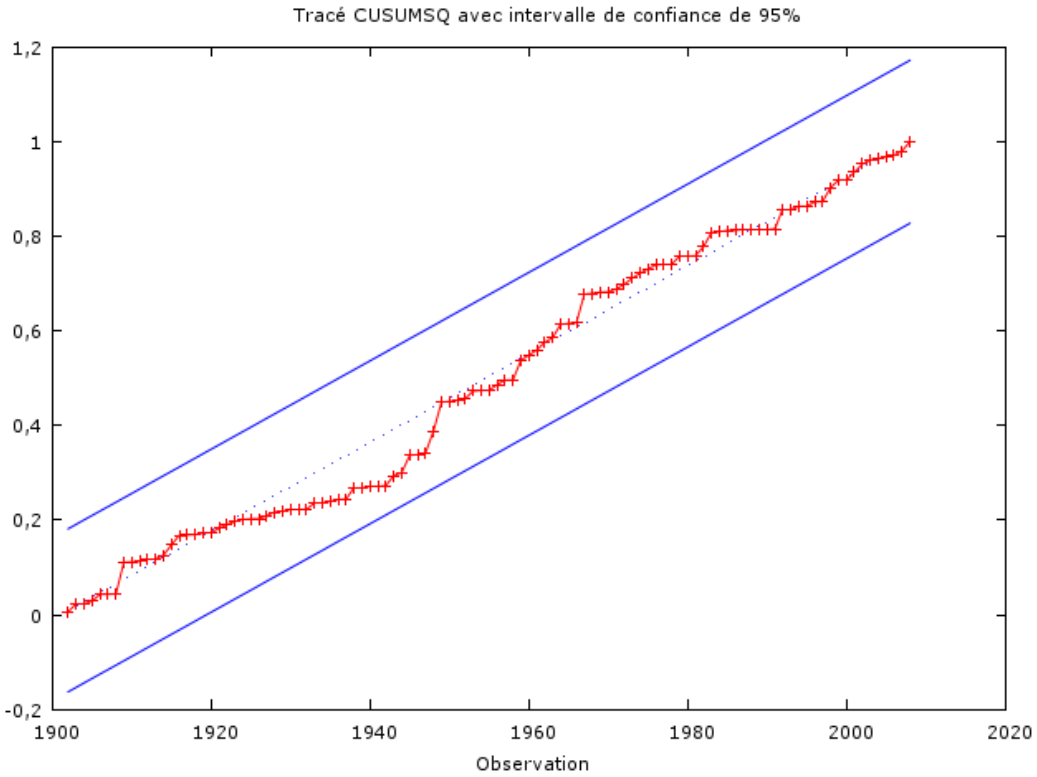
a) Algeria



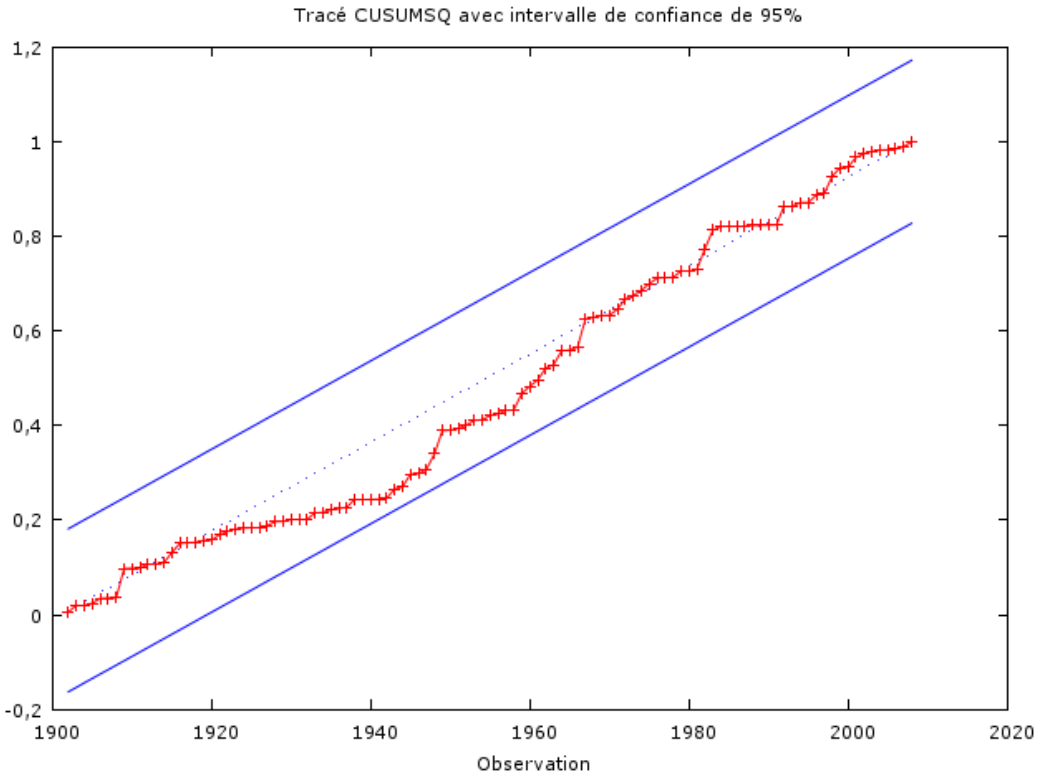
b) Egypt



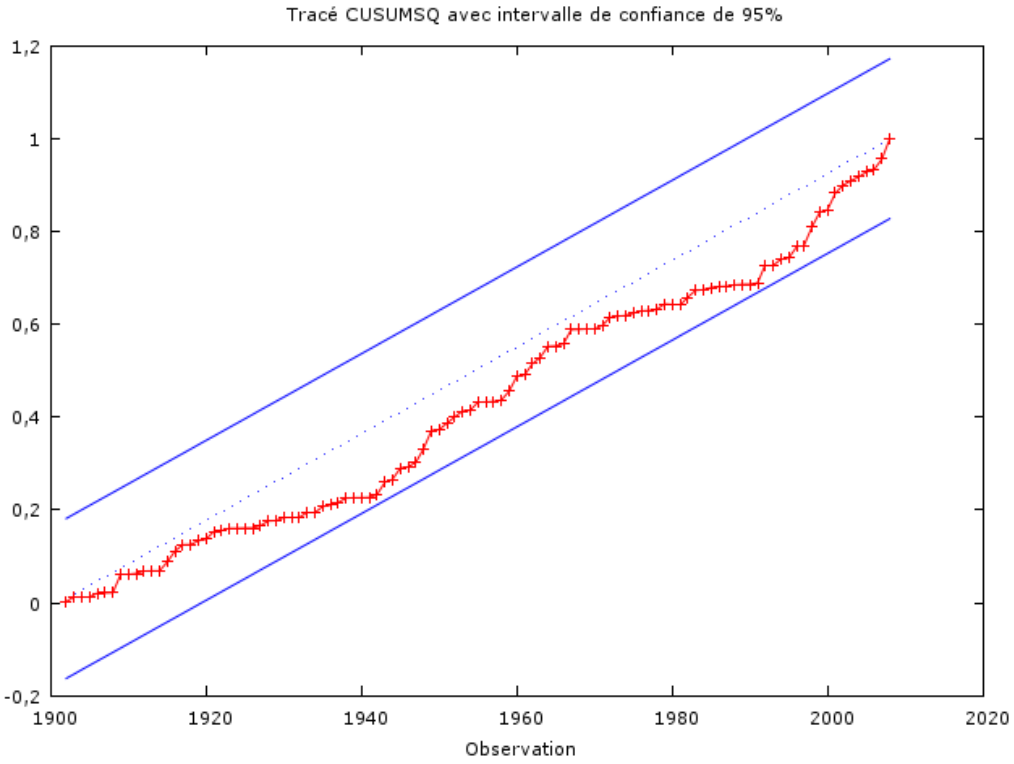
c) Israel



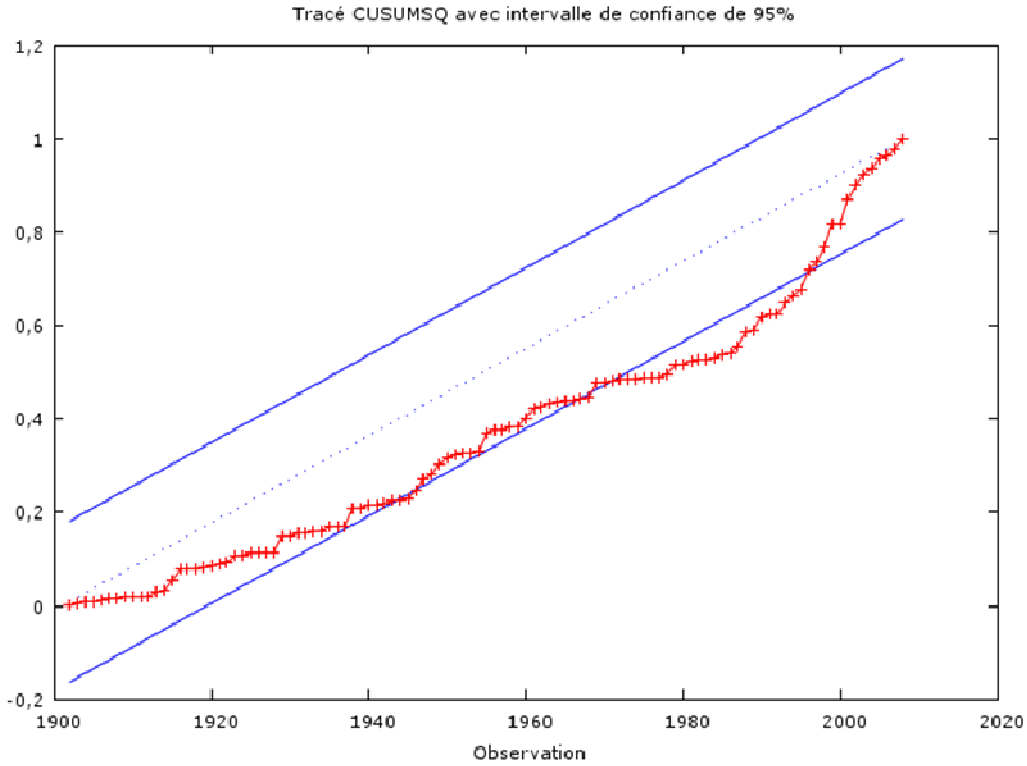
d) Jordan



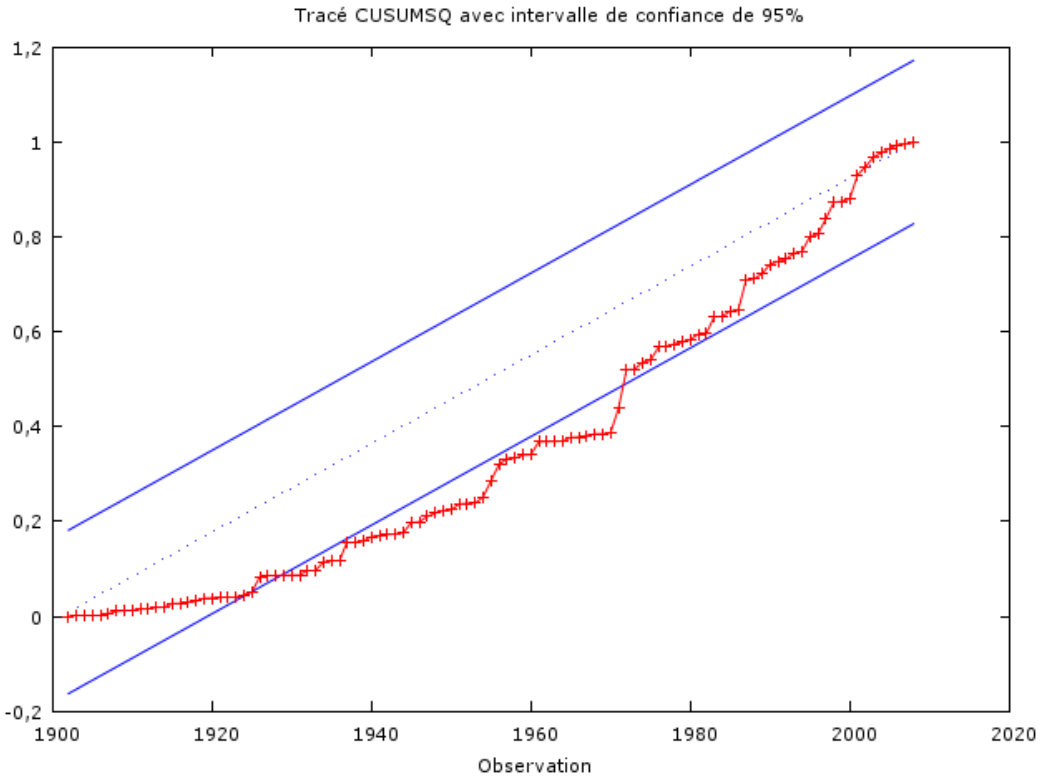
e) Lebanon



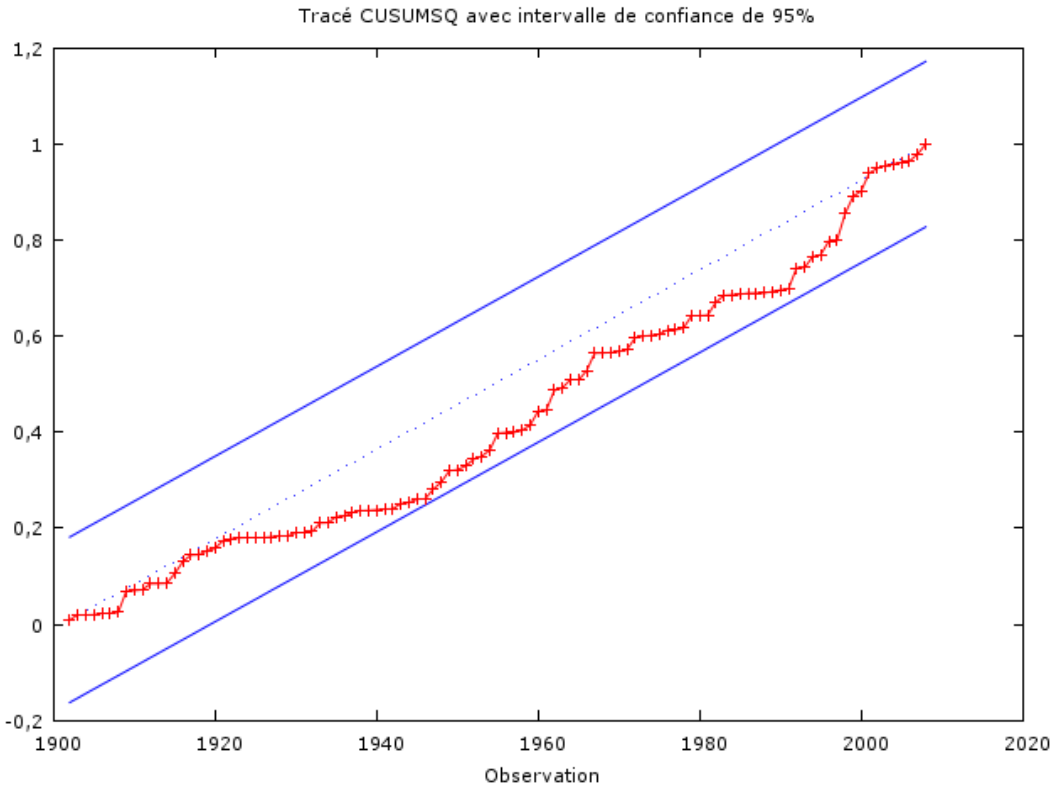
f) Libya



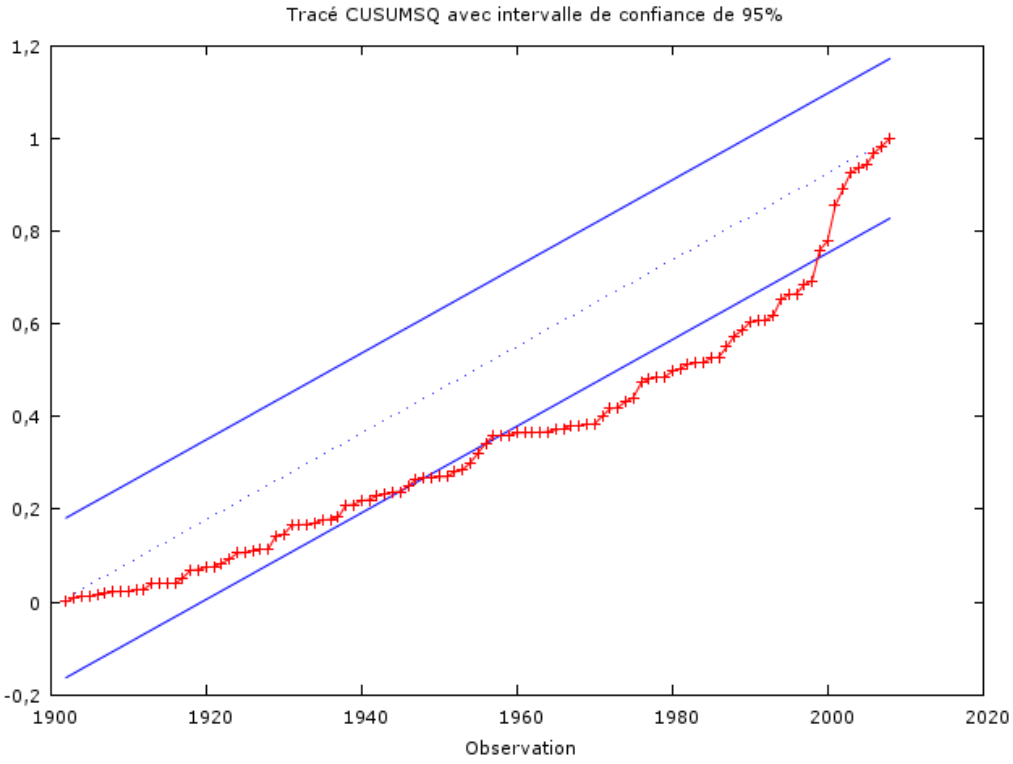
g) Morocco



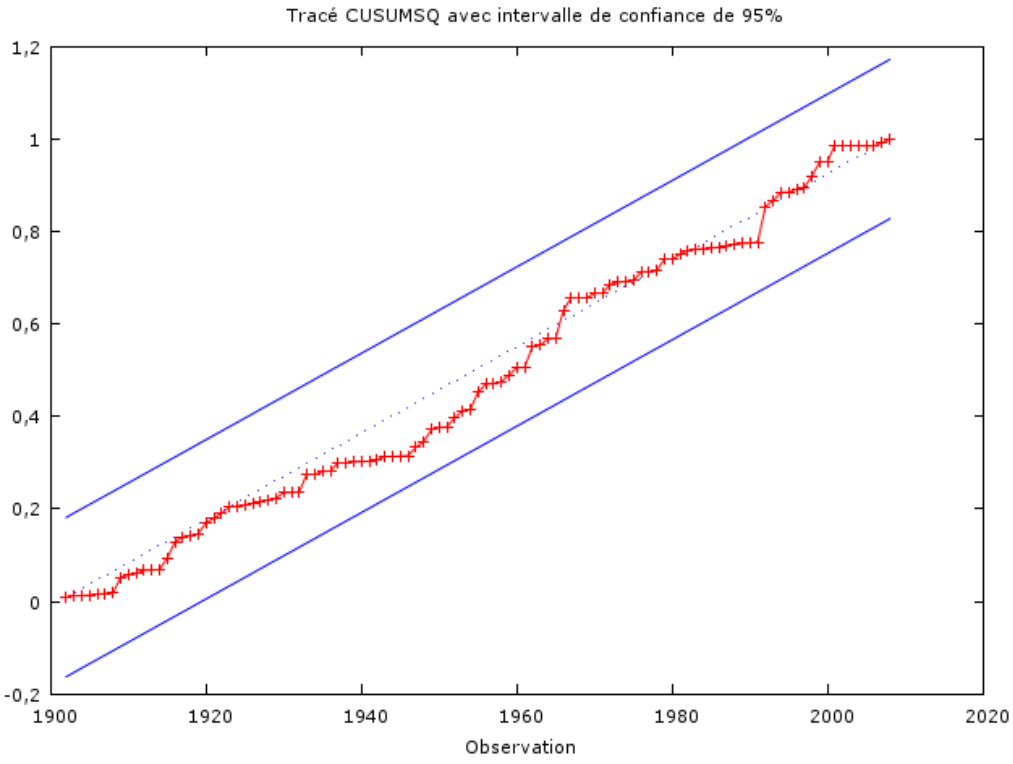
h) Syria



i) Tunisia



j) Turkey



Annex 3a: Parameter estimates at detailed geographical level (temperature)

Temperature increase
No temperature variation
Temperature decrease

T bef SC	Average temperature before structural change
T after SC	Average temperature after structural change
T 30y bef SC	Average temperature 30 years before structural change
T 20y bef SC	Average temperature 20 years before structural change
T 10y bef SC	Average temperature 10 years before structural change
T 2000-08	Average temperature in 2000-2008

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
1	Algeria			.0407343	7.77	23,1	23,4	0,3	23,1	0,3	23,0	0,3	23,0	0,3	23,1	24,0	0,9
2	Algeria	-9,00	29,00	.0321853	4.57	18,7	18,8	0,1	18,6	0,1	18,5	0,3	18,4	0,4	18,6	19,2	0,6
3	Algeria	-9,00	28,00	.0341586	4.25	21,6	21,6	0,0	21,5	0,1	21,4	0,3	21,3	0,3	21,5	22,2	0,7
4	Algeria	-9,00	27,00	.0298638	3.68	22,6	22,6	0,0	22,5	0,1	22,5	0,2	22,4	0,2	22,5	23,1	0,5
5	Algeria	-9,00	26,00	.0251678	3.11	23,3	23,3	0,0	23,3	0,1	23,2	0,1	23,3	0,1	23,3	23,7	0,4
6	Algeria	-8,00	29,00	.0364081	4.70	21,6	21,6	0,0	21,5	0,1	21,3	0,3	21,2	0,4	21,5	22,2	0,7
7	Algeria	-8,00	28,00	.0390305	4.05	23,5	23,5	0,0	23,4	0,1	23,2	0,3	23,2	0,4	23,4	24,2	0,9
8	Algeria	-8,00	27,00	.0291808	3.30	23,2	23,1	-0,1	23,1	0,0	23,0	0,1	22,9	0,2	23,1	23,6	0,5
9	Algeria	-8,00	26,00	.0258407	3.01	23,2	23,1	-0,1	23,1	0,0	23,1	0,1	23,1	0,1	23,1	23,5	0,4
10	Algeria	-7,00	29,00	.0363971	4.61	21,7	21,7	0,0	21,6	0,1	21,4	0,3	21,3	0,4	21,6	22,2	0,7
11	Algeria	-7,00	28,00	.0305942	3.47	23,2	23,1	-0,1	23,1	0,0	22,9	0,2	22,8	0,3	23,1	23,6	0,5
12	Algeria	-7,00	27,00	.0274364	3.05	22,5	22,4	-0,1	22,4	0,0	22,3	0,1	22,2	0,2	22,4	22,9	0,4
13	Algeria	-7,00	26,00	.0250976	2.78	22,7	22,6	-0,1	22,7	0,0	22,6	0,1	22,5	0,1	22,7	23,0	0,4
14	Algeria	-7,00	25,00	.0229164	2.53	23,2	23,2	0,0	23,2	0,0	23,2	0,0	23,1	0,0	23,2	23,5	0,4
15	Algeria	-6,00	30,00	.0443174	6.15	19,9	20,1	0,2	19,9	0,2	19,7	0,4	19,6	0,5	19,9	20,7	0,9
16	Algeria	-6,00	29,00	.0373682	4.73	20,5	20,6	0,1	20,4	0,2	20,2	0,3	20,1	0,4	20,4	21,1	0,7
17	Algeria	-6,00	28,00	.0302869	3.48	22,7	22,7	0,0	22,6	0,1	22,5	0,2	22,4	0,3	22,6	23,2	0,5
18	Algeria	-6,00	27,00	.0274629	3.06	22,4	22,4	0,0	22,3	0,0	22,2	0,1	22,1	0,2	22,3	22,8	0,5
19	Algeria	-6,00	26,00	.0262474	2.90	23,0	23,0	0,0	23,0	0,0	22,9	0,1	22,8	0,2	23,0	23,4	0,4
20	Algeria	-6,00	25,00	.0242888	2.64	23,2	23,2	0,0	23,2	0,0	23,1	0,0	23,1	0,1	23,2	23,6	0,4
21	Algeria	-5,00	30,00	.0458885	6.37	18,6	18,8	0,2	18,5	0,3	18,4	0,4	18,3	0,6	18,5	19,5	1,0
22	Algeria	-5,00	29,00	.0427755	5.55	20,4	20,6	0,2	20,3	0,3	20,2	0,4	20,1	0,5	20,3	21,2	0,9
23	Algeria	-5,00	28,00	.0342352	4.05	22,1	22,2	0,1	22,0	0,2	21,9	0,3	21,8	0,4	22,0	22,7	0,7
24	Algeria	-5,00	27,00	.0304975	3.47	22,3	22,3	0,0	22,2	0,1	22,1	0,2	22,0	0,3	22,2	22,8	0,6
25	Algeria	-5,00	26,00	.0296869	3.37	22,4	22,4	0,0	22,3	0,1	22,2	0,1	22,1	0,2	22,3	22,8	0,5
26	Algeria	-5,00	25,00	.0283091	3.19	23,4	23,4	0,0	23,3	0,1	23,3	0,1	23,2	0,2	23,3	23,8	0,5
27	Algeria	-5,00	24,00	.0265209	3.05	24,6	24,6	0,0	24,5	0,0	24,5	0,0	24,5	0,1	24,5	25,0	0,4
28	Algeria	-4,00	31,00	.0430983	5.86	22,1	22,3	0,2	22,1	0,3	22,0	0,4	21,8	0,5	22,1	23,0	1,0
29	Algeria	-4,00	30,00	.0488009	6.68	21,2	21,6	0,4	21,2	0,4	21,1	0,5	21,0	0,6	21,2	22,3	1,2
30	Algeria	-4,00	29,00	.0521866	7.15	20,9	21,3	0,4	20,8	0,5	20,8	0,5	20,7	0,6	20,8	22,1	1,2
31	Algeria	-4,00	28,00	.047652	6.36	21,4	21,7	0,3	21,3	0,4	21,2	0,4	21,2	0,5	21,3	22,4	1,1
32	Algeria	-4,00	27,00	.0427089	5.51	21,7	21,9	0,2	21,6	0,3	21,5	0,3	21,4	0,4	21,6	22,5	0,9
33	Algeria	-4,00	26,00	.0398448	5.03	22,9	23,1	0,2	22,9	0,2	22,8	0,3	22,7	0,4	22,9	23,7	0,8
34	Algeria	-4,00	25,00	.037857	4.85	24,6	24,7	0,1	24,5	0,2	24,5	0,2	24,4	0,3	24,5	25,2	0,7
35	Algeria	-4,00	24,00	.035375	4.88	26,7	26,8	0,1	26,6	0,2	26,6	0,2	26,5	0,3	26,6	27,3	0,7
36	Algeria	-4,00	23,00	.0345908	5.70	28,6	28,7	0,1	28,5	0,2	28,5	0,2	28,5	0,3	28,5	29,3	0,7
37	Algeria	-3,00	35,00	.03134	5.04	16,9	16,9	0,0	16,9	-0,1	16,9	0,0	16,7	0,2	16,9	17,2	0,2
38	Algeria	-3,00	34,00	.0422192	7.40	13,7	13,6	-0,1	13,8	-0,1	13,7	-0,1	13,5	0,1	13,8	14,2	0,5
39	Algeria	-3,00	32,00	.0344148	4.49	20,0	20,2	0,2	20,0	0,1	20,0	0,2	19,9	0,3	20,0	20,8	0,8
40	Algeria	-3,00	31,00	.0423323	5.62	21,4	21,7	0,3	21,4	0,3	21,3	0,4	21,2	0,5	21,4	22,4	1,0
41	Algeria	-3,00	30,00	.0531741	7.33	21,7	22,2	0,5	21,7	0,6	21,7	0,6	21,6	0,7	21,7	23,1	1,4
42	Algeria	-3,00	29,00	.0536382	7.49	22,9	23,3	0,4	22,8	0,5	22,8	0,6	22,7	0,6	22,8	24,1	1,4
43	Algeria	-3,00	28,00	.0537559	7.56	23,2	23,6	0,4	23,2	0,5	23,1	0,5	23,0	0,6	23,2	24,4	1,3
44	Algeria	-3,00	27,00	.050538	7.12	23,6	24,0	0,4	23,6	0,4	23,5	0,4	23,4	0,5	23,6	24,7	1,1
45	Algeria	-3,00	26,00	.0478991	6.69	24,6	24,9	0,3	24,6	0,3	24,5	0,4	24,4	0,5	24,6	25,6	1,0
46	Algeria	-3,00	25,00	.045076	6.46	26,4	26,6	0,2	26,3	0,3	26,3	0,3	26,2	0,4	26,3	27,3	1,0
47	Algeria	-3,00	24,00	.0409098	6.33	28,2	28,4	0,2	28,1	0,3	28,1	0,3	28,0	0,4	28,1	29,0	0,9
48	Algeria	-3,00	23,00	.0380813	6.36	29,0	29,2	0,2	28,9	0,3	28,9	0,3	28,9	0,3	28,9	29,8	0,9
49	Algeria	-2,00	35,00	.0544626	9.50	13,9	14,0	0,1	14,0	0,0	13,9	0,1	13,8	0,2	14,0	14,8	0,8
50	Algeria	-2,00	34,00	.0481517	8.32	14,1	14,2	0,1	14,2	0,0	14,1	0,1	14,0	0,2	14,2	14,9	0,7
51	Algeria	-2,00	33,00	.0415572	5.85	16,9	17,2	0,3	17,0	0,2	16,9	0,3	16,8	0,4	17,0	17,9	0,9
52	Algeria	-2,00	32,00	.028734	3.51	20,8	21,1	0,3	20,9	0,2	20,9	0,3	20,8	0,4	20,9	21,7	0,8
53	Algeria	-2,00	31,00	.0453378	5.99	22,6	23,0	0,4	22,6	0,4	22,6	0,4	22,5	0,5	22,6	23,7	1,1
54	Algeria	-2,00	30,00	.0610962	8.66	23,2	23,9	0,7	23,1	0,8	23,1	0,8	23,1	0,8	23,1	24,8	1,7
55	Algeria	-2,00	29,00	.0525942	7.50	23,5	24,0	0,5	23,5	0,5	23,5	0,6	23,4	0,6	23,5	24,8	1,3
56	Algeria	-2,00	28,00	.0519459	7.47	23,8	24,2	0,4	23,8	0,4	23,8	0,5	23,7	0,5	23,8	25,0	1,2
57	Algeria	-2,00	27,00	.0499626	7.18	24,6	24,9	0,3	24,5	0,4	24,5	0,4	24,4	0,5	24,5	25,7	1,1
58	Algeria	-2,00	26,00	.0473939	6.85	25,6	25,9	0,3	25,6	0,3	25,5	0,3	25,4	0,4	25,6	26,6	1,0
59	Algeria	-2,00	25,00	.044146	6.64	26,9	27,2	0,3	26,9	0,3	26,8	0,3	26,7	0,4	26,9	27,8	1,0
60	Algeria	-2,00	24,00	.0406591	6.52	28,1	28,3	0,2	28,1	0,3	28,0	0,3	27,9	0,4	28,1	29,0	0,9
61	Algeria	-2,00	23,00	.0379956	6.30	28,6	28,9	0,3	28,6	0,3	28,5	0,3	28,5	0,4	28,6	29,5	0,9
62	Algeria	-2,00	22,00	.0353257	5.80	28,5	28,8	0,3	28,5	0,3	28,5	0,4	28,5	0,3	28,5	29,4	0,9
63	Algeria	-1,00	35,00	.0460034	7.26	15,4	15,5	0,1	15,5	0,0	15,4	0,1	15,3	0,2	15,5	16,2	0,7
64	Algeria	-1,00	34,00	.0552896	8.69	16,9	17,1	0,2	17,0	0,1	16,9	0,2	16,8	0,3	17,0	18,0	0,9
65	Algeria	-1,00	33,00	.050062	6.39	15,9	16,4	0,5	16,1	0,4	15,9	0,5	15,8	0,6	16,1	17,2	1,1
66	Algeria	-1,00	32,00	.0379299	4.84	20,5	20,9	0,4	20,6	0,3	20,5	0,4	20,5	0,5	20,6	21,6	0,9
67	Algeria	-1,00	31,00	.0442527	5.97	21,3	21,8	0,5	21,4	0,4	21,3	0,5	21,2	0,5	21,4	22,5	1,1
68	Algeria	-1,00	30,00	.0515027	7.36	22,9	23,5	0,6	22,9	0,6	22,9	0,6	22,8	0,7	22,9	24,3	1,3
69	Algeria	-1,00	29,00	.0490708	7.04	23,7	24,1	0,4	23,7	0,4	23,7	0,5	23,6	0,6	23,7	24,9	1,2
70	Algeria	-1,00	28,00	.0505608	7.31	24,4	24,7	0,3	24,4	0,4	24,3	0,4	24,2	0,5	24,4	25,5	1,1
71	Algeria	-1,00	27,00	.0473848	6.85	25,1	25,4	0,3	25,1	0,3	25,0	0,3	24,9	0,4	25,1	26,1	1,0
72	Algeria	-1,00	26,00	.0451007	6.55	26,2	26,4	0,2	26,2	0,2	26,1	0,3	26,0	0,4	26,2	27,1	0,9
73	Algeria	-1,00	25,00	.0420861	6.46	27,3	27,5	0,2	27,3	0,2	27,2	0,3	27,1	0,4	27,3	28,2	0,9
74	Algeria	-1,00	24,00	.0385199	6.36	27,7	27,9	0,2	27,7	0,2	27,6	0,3	27,6	0,3	27,7	28,5	0,9
75	Algeria	-1,00	23,00	.0358792	6.07	28,5	28,7	0,2	28,5	0,3	28,4	0,3	28,4	0,3	28,5	29,3	0,9
76	Algeria	-1,00	22,00	.0336415	5.37	28,9	29,2	0,3	28,8	0,3	28,8	0,4	28,8	0,3	28,8	29,7	0,9
77	Algeria	-1,00	21,00	.0331756	5.27	29,2	29,5	0,3	29,1	0,4	29,1	0,4	29,2	0,4	29,1	30,1	0,9
78	Algeria	0,00	36,00	.0406071	6.85	17,8	17,9	0,1	17,9	0,0	17,9	0,1	17,8	0,1	17,9	18,4	0,5
79	Algeria	0,00	35,00	.0513322	8.55	14,6	14,6	0,0	14,7	-0,2	14,6	-0,1	14,6	0,0	14,7	15,4	0,7
80	Algeria	0,00	34,00	.0578756	7.59	18,4	18,5	0,1	18,5	0,0	18,3	0,2	18,3	0,3	18,5	19,5	0,9

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
81	Algeria	0,00	33,00	.0565315	6.52	16,2	16,9	0,7	16,4	0,5	16,2	0,7	16,1	0,8	16,4	17,7	1,3
82	Algeria	0,00	32,00	.0482101	6.06	19,6	20,2	0,6	19,8	0,4	19,6	0,6	19,5	0,7	19,8	20,9	1,2
83	Algeria	0,00	31,00	.0470803	6.44	21,9	22,4	0,5	22,0	0,4	21,8	0,5	21,7	0,6	22,0	23,1	1,1
84	Algeria	0,00	30,00	.0471414	6.45	23,2	23,7	0,5	23,2	0,5	23,2	0,5	23,1	0,6	23,2	24,3	1,1
85	Algeria	0,00	29,00	.0436663	6.18	24,5	24,9	0,4	24,6	0,3	24,5	0,4	24,4	0,5	24,6	25,6	1,0
86	Algeria	0,00	28,00	.0416949	5.46	25,1	25,3	0,2	25,1	0,2	25,0	0,3	24,9	0,4	25,1	26,0	0,9
87	Algeria	0,00	27,00	.0420114	5.86	25,5	25,7	0,2	25,5	0,2	25,5	0,2	25,4	0,4	25,5	26,4	0,9
88	Algeria	0,00	26,00	.042377	6.27	27,1	27,3	0,2	27,1	0,2	27,1	0,2	26,9	0,4	27,1	28,0	0,8
89	Algeria	0,00	25,00	.0402196	6.43	27,8	28,0	0,2	27,8	0,2	27,8	0,2	27,7	0,3	27,8	28,6	0,8
90	Algeria	0,00	24,00	.0369424	6.37	28,2	28,4	0,2	28,2	0,2	28,1	0,2	28,1	0,3	28,2	29,0	0,8
91	Algeria	0,00	23,00	.0332859	5.75	28,5	28,7	0,2	28,5	0,2	28,4	0,3	28,4	0,3	28,5	29,3	0,8
92	Algeria	0,00	22,00	.0318178	4.99	28,9	29,2	0,3	28,9	0,3	28,8	0,4	28,9	0,3	28,9	29,7	0,8
93	Algeria	0,00	21,00	.0328437	4.94	29,2	29,6	0,4	29,2	0,4	29,1	0,5	29,2	0,4	29,2	30,1	0,9
94	Algeria	1,00	36,00	.047518	6.15	17,6	17,7	0,1	17,7	0,0	17,6	0,1	17,7	0,0	17,7	18,5	0,9
95	Algeria	1,00	35,00	.0449192	6.88	14,6	14,6	0,0	14,7	-0,2	14,6	0,0	14,6	-0,1	14,7	15,3	0,6
96	Algeria	1,00	34,00	.0590664	7.10	14,2	14,7	0,5	14,4	0,3	14,1	0,5	14,2	0,5	14,4	15,5	1,1
97	Algeria	1,00	33,00	.0586297	7.23	17,5	17,9	0,4	17,6	0,3	17,4	0,5	17,3	0,6	17,6	18,8	1,2
98	Algeria	1,00	32,00	.0560692	7.29	19,3	19,8	0,5	19,5	0,3	19,3	0,5	19,1	0,7	19,5	20,7	1,2
99	Algeria	1,00	31,00	.0528714	7.40	22,1	22,5	0,4	22,2	0,3	22,1	0,5	21,9	0,6	22,2	23,3	1,1
100	Algeria	1,00	30,00	.049555	6.72	23,2	23,7	0,5	23,3	0,4	23,2	0,5	23,0	0,6	23,3	24,3	1,0
101	Algeria	1,00	29,00	.0441058	6.24	23,6	24,0	0,4	23,7	0,3	23,6	0,4	23,4	0,5	23,7	24,6	0,9
102	Algeria	1,00	28,00	.0360378	4.82	25,2	25,4	0,2	25,3	0,1	25,2	0,2	25,1	0,3	25,3	26,0	0,7
103	Algeria	1,00	27,00	.0404676	5.79	25,9	26,0	0,1	26,0	0,1	25,9	0,2	25,8	0,3	26,0	26,7	0,7
104	Algeria	1,00	26,00	.0412372	6.32	27,4	27,6	0,2	27,5	0,1	27,4	0,2	27,3	0,3	27,5	28,2	0,8
105	Algeria	1,00	25,00	.0388017	6.43	28,9	29,0	0,1	28,9	0,1	28,9	0,2	28,8	0,3	28,9	29,7	0,7
106	Algeria	1,00	24,00	.0347284	6.22	28,1	28,3	0,2	28,2	0,1	28,1	0,2	28,0	0,2	28,2	28,9	0,7
107	Algeria	1,00	23,00	.031423	5.46	28,4	28,6	0,2	28,4	0,2	28,3	0,3	28,3	0,2	28,4	29,1	0,7
108	Algeria	1,00	22,00	.0300607	4.70	28,7	28,9	0,2	28,7	0,3	28,6	0,3	28,7	0,3	28,7	29,4	0,8
109	Algeria	1,00	21,00	.0329349	4.75	29,0	29,3	0,3	29,0	0,4	28,9	0,5	29,0	0,4	29,0	29,9	0,9
110	Algeria	1,00	20,00	.0331546	5.04	28,9	29,3	0,4	28,8	0,5	28,8	0,5	28,9	0,4	28,8	29,9	1,0
111	Algeria	2,00	36,00	.0488046	6.62	14,5	14,4	-0,1	14,5	-0,1	14,3	0,1	14,6	-0,2	14,5	15,2	0,8
112	Algeria	2,00	35,00	.0571115	7.71	14,8	14,9	0,1	14,9	0,1	14,7	0,2	14,8	0,1	14,9	15,9	1,1
113	Algeria	2,00	34,00	.0609831	7.56	14,5	14,9	0,4	14,6	0,3	14,4	0,5	14,5	0,5	14,6	15,8	1,2
114	Algeria	2,00	33,00	.0623217	8.02	18,1	18,6	0,5	18,2	0,3	18,1	0,5	18,0	0,6	18,2	19,5	1,3
115	Algeria	2,00	32,00	.059309	8.13	22,1	22,4	0,3	22,2	0,2	22,0	0,4	21,8	0,6	22,2	23,3	1,1
116	Algeria	2,00	31,00	.0593482	8.44	21,2	21,5	0,3	21,3	0,2	21,1	0,4	20,9	0,6	21,3	22,3	1,0
117	Algeria	2,00	30,00	.053848	7.82	22,2	22,5	0,3	22,3	0,2	22,2	0,4	22,0	0,6	22,3	23,3	1,0
118	Algeria	2,00	29,00	.0470319	7.03	23,4	23,6	0,2	23,5	0,2	23,3	0,3	23,2	0,4	23,5	24,3	0,9
119	Algeria	2,00	28,00	.0452074	6.90	23,9	24,1	0,2	24,0	0,1	23,9	0,2	23,8	0,3	24,0	24,8	0,8
120	Algeria	2,00	27,00	.0438834	7.05	26,6	26,7	0,1	26,6	0,0	26,6	0,1	26,4	0,3	26,6	27,4	0,7
121	Algeria	2,00	26,00	.0419329	6.84	27,8	27,9	0,1	27,8	0,1	27,8	0,1	27,7	0,2	27,8	28,6	0,7
122	Algeria	2,00	25,00	.0374631	6.59	26,6	26,7	0,1	26,6	0,1	26,6	0,1	26,5	0,2	26,6	27,3	0,7
123	Algeria	2,00	24,00	.033099	6.08	26,7	26,8	0,1	26,7	0,1	26,7	0,1	26,7	0,2	26,7	27,4	0,6
124	Algeria	2,00	23,00	.0301619	5.42	27,6	27,7	0,1	27,6	0,2	27,5	0,2	27,6	0,2	27,6	28,2	0,6
125	Algeria	2,00	22,00	.0283383	4.62	28,6	28,8	0,2	28,5	0,3	28,5	0,3	28,5	0,2	28,5	29,2	0,7
126	Algeria	2,00	21,00	.0306461	4.74	28,4	28,7	0,3	28,3	0,4	28,2	0,4	28,3	0,3	28,3	29,2	0,8
127	Algeria	2,00	20,00	.0306625	4.88	27,9	28,3	0,4	27,8	0,4	27,8	0,5	27,9	0,4	27,8	28,8	1,0
128	Algeria	2,00	19,00	.0264699	4.36	28,5	28,9	0,4	28,4	0,5	28,4	0,6	28,5	0,4	28,4	29,4	1,0
129	Algeria	3,00	36,00	.0640369	8.78	16,2	16,3	0,1	16,2	0,0	16,0	0,3	16,3	0,0	16,2	17,4	1,1
130	Algeria	3,00	35,00	.0628096	7.84	16,2	16,5	0,3	16,3	0,3	16,1	0,4	16,2	0,3	16,3	17,6	1,3
131	Algeria	3,00	34,00	.061326	6.45	17,2	17,7	0,5	17,3	0,4	17,2	0,4	17,3	0,4	17,3	18,4	1,1
132	Algeria	3,00	33,00	.0682788	8.94	19,8	20,2	0,4	19,8	0,4	19,7	0,5	19,6	0,6	19,8	21,3	1,5
133	Algeria	3,00	32,00	.055668	7.49	22,9	23,1	0,2	23,0	0,1	22,8	0,3	22,6	0,5	23,0	24,0	0,9
134	Algeria	3,00	31,00	.064362	8.72	21,6	21,9	0,3	21,7	0,1	21,5	0,4	21,3	0,6	21,7	22,7	1,0
135	Algeria	3,00	30,00	.0595716	8.52	21,7	21,9	0,2	21,8	0,1	21,6	0,4	21,4	0,6	21,8	22,8	1,0
136	Algeria	3,00	29,00	.0513349	7.80	23,0	23,2	0,2	23,1	0,1	22,9	0,3	22,8	0,4	23,1	24,0	0,9
137	Algeria	3,00	28,00	.048076	7.16	25,0	25,2	0,2	25,1	0,1	25,0	0,2	24,9	0,3	25,1	26,0	0,9
138	Algeria	3,00	27,00	.0453843	7.34	26,0	26,2	0,2	26,1	0,0	26,0	0,1	25,9	0,2	26,1	26,9	0,8
139	Algeria	3,00	26,00	.0417788	7.16	26,8	26,9	0,1	26,9	0,0	26,8	0,1	26,7	0,2	26,9	27,6	0,7
140	Algeria	3,00	25,00	.0361546	6.64	26,9	27,0	0,1	26,9	0,1	26,9	0,1	26,8	0,2	26,9	27,6	0,6
141	Algeria	3,00	24,00	.0314604	5.90	26,9	27,0	0,1	26,9	0,1	26,9	0,1	26,9	0,1	26,9	27,5	0,6
142	Algeria	3,00	23,00	.0278696	5.09	27,7	27,8	0,1	27,7	0,1	27,6	0,2	27,7	0,1	27,7	28,2	0,6
143	Algeria	3,00	22,00	.0269732	4.78	27,7	27,9	0,2	27,7	0,2	27,6	0,3	27,7	0,2	27,7	28,3	0,7
144	Algeria	3,00	21,00	.0279599	4.82	27,4	27,7	0,3	27,4	0,3	27,3	0,4	27,4	0,3	27,4	28,1	0,8
145	Algeria	3,00	20,00	.0281066	4.94	27,7	28,1	0,4	27,6	0,4	27,6	0,5	27,7	0,3	27,6	28,5	0,9
146	Algeria	3,00	19,00	.0267872	4.80	28,6	29,0	0,4	28,5	0,5	28,5	0,5	28,6	0,4	28,5	29,5	1,0
147	Algeria	3,00	18,00	.0244784	4.64	28,7	29,2	0,5	28,6	0,6	28,6	0,6	28,8	0,4	28,6	29,6	1,0
148	Algeria	4,00	37,00	.0441113	6.04	18,1	18,3	0,2	18,4	-0,1	18,2	0,1	18,0	0,3	18,4	18,8	0,4
149	Algeria	4,00	36,00	.0780911	9.80	16,9	17,4	0,5	17,0	0,3	16,9	0,5	16,8	0,5	17,0	18,7	1,6
150	Algeria	4,00	35,00	.0723757	8.45	14,1	14,6	0,5	14,2	0,4	14,1	0,5	14,1	0,5	14,2	15,8	1,6
151	Algeria	4,00	34,00	.067056	7.97	17,8	18,1	0,3	17,8	0,3	17,7	0,4	17,6	0,4	17,8	19,1	1,3
152	Algeria	4,00	33,00	.063446	8.32	20,9	21,3	0,4	20,9	0,4	20,7	0,5	20,6	0,7	20,9	22,3	1,4
153	Algeria	4,00	32,00	.0573176	8.07	21,7	21,9	0,2	21,8	0,1	21,6	0,3	21,4	0,5	21,8	22,8	1,0
154	Algeria	4,00	31,00	.0606521	8.75	22,3	22,6	0,3	22,5	0,1	22,2	0,3	22,0	0,6	22,5	23,4	1,0
155	Algeria	4,00	30,00	.059609	8.78	22,5	22,7	0,2	22,6	0,1	22,4	0,3	22,2	0,6	22,6	23,6	1,0
156	Algeria	4,00	29,00	.0536027	8.25	23,4	23,7	0,3	23,5	0,1	23,4	0,3	23,2	0,5	23,5	24,5	1,0
157	Algeria	4,00	28,00	.0486952	7.36	24,1	24,3	0,2	24,2	0,1	24,0	0,2	23,9	0,3	24,2	25,0	0,9
158	Algeria	4,00	27,00	.0451335	7.18	25,6	25,8	0,2	25,7	0,1	25,6	0,2	25,5	0,3	25,7	26,5	0,8
159	Algeria	4,00	26,00	.0401758	7.08	23,3	23,4	0,1	23,3	0,1	23,3	0,2	23,2	0,2	23,3	24,1	0,7
160	Algeria	4,00	25,00	.0339725	6.47	25,6	25,7	0,1	25,6	0,1	25,5	0,1	25,6	0,1	25,6	26,2	0,6
161	Algeria	4,00	24,00	.0293148	5.53	26,8	26,9	0,1	26,8	0,1	26,7	0,2	26,8	0,1	26,8	27,3	0,5
162	Algeria	4,00	23,00	.0262656	4.81	27,1	27,2	0,1	27,1	0,1	27,0	0,2	27,1	0,0	27,1	27,6	0,5
163	Algeria	4,00	22,00	.0265775	4.92	27,0	27,2	0,2	27,0	0,2	26,9	0,3	27,1	0,1	27,0	27,6	0,6
164	Algeria	4,00	21,00	.0272367	5.11	26,3	26,5	0,2	26,2	0,3	26,2	0,4	26,3	0,2	26,2	26,9	0,7
165	Algeria	4,00	20,00	.0283711	5.44	28,4	28,7	0,3	28,3	0,4	28,3	0,5	28,4	0,3	28,3	29,2	0,9
166	Algeria	4,00	19,00	.0294188	5.70	29,0	29,4	0,4	28,9	0,5	28,9	0,5	29,1	0,4	28,9	30,0	1,1
167	Algeria	5,00	36,00	.0732684	8.21	16,3	16,7	0,4	16,5	0,3	16,3	0,4	16,2	0,6	16,5	17,9	1,4
168	Algeria	5,00	35,00	.0780665	9.77	17,9	18,5	0,6	18,0	0,5	17,8	0,7	17,7	0,8	18,0	19,8	1,7
169	Algeria	5,00	34,00	.0612841	8.67	19,7	20,0	0,3	19,7	0,3	19,6	0,5	19,5	0,6	19,7	20,9	1,2
170	Algeria	5,00	33,00	.0575182	8.46	21,6	21,9	0,3	21,7	0,2	21,5	0,4	21,3	0,6	21,7	22,8	1,1
171	Algeria	5,00	32,00	.0568334	8.43	22,0	22,3	0,3	22,1	0,2	21,9	0,4	21,7	0,6	22,1	23,2	1,1
172	Algeria	5,00	31,00	.0570878	8.63	22,2	22,5	0,3	22,3	0,2	22,1	0,3	21,9	0,6	22,3	23,4	1,0
173	Algeria	5,00	30,00	.0595643	8.82	22,0	22,2	0,2	22,0	0,2	21,9	0,4	21,6	0,6	22,0	23,1	1,1
174	Algeria	5,00	29,00	.0569227	8.61	23,0	23,3	0,3	23,1	0,2	22,9	0,3	22,8	0,5	23,1	24,2	1,1
175	Algeria	5,00	28,00	.0503082	7.66	24,9	25,1	0,2	24,9	0,2	24,8	0,3	24,7	0,4	24,9	25,9	1,0
176	Algeria	5,00	27,00	.0432952	7.05	24,3	24,5	0,2	24,4	0,1	24,3	0,2	24,2	0,3	24,4	25,2	0,9
177	Algeria	5,00	26,00	.0359585	6.64	20,0	20,1	0,1	20,0	0,1	20,0	0,2	20,0	0,2	20,0	20,7	0,7
178	Algeria	5,00	25,00	.0305358	5.92	24,4	24,5	0,1	24,4	0,1	24,4	0,2	24,4	0,1	24,4	25,0	0,6
179	Algeria	5,00	24,00	.027441	5.14	24,6	24,8	0,2	24,7	0,1	24,6	0,2	24,7	0,0	24,7	25,2	0,5
180	Algeria	5,00	23,00	.025786	4.60	25,1	25,2	0,1	25,1	0,1	25,0	0,2	25,2	0,0	25,1	25,6	0,5
181	Algeria	5,00	22,00	.0268127	5.03	25,9	26,1	0,2	25,8	0,3	25,8	0,3	26,0	0,1	25,8	26,5	0,7
182	Algeria	5,00	21,00	.0281614	5.50	27,2	27,4	0,2	27,1	0,4	27,0	0,4	27,2	0,2	27,1	27,8	0,8
183	Algeria	5,00	20,00	.0320604	6.40	27,8	28,2	0,4	27,7	0,5	27,7	0,5	27,9	0,3	27,7	28,7	1,0
184	Algeria	5,00	19,00	.0370765	6.8	28,7	29,1	0,4	28,5	0,6	28,5	0,6	28,7	0,4	28,5	29,8	1,3
185	Algeria	6,00	37,00	.0460079	5.67	15,9	15,8	-0,1	16,2	-0,3	16,1	-0,2	15,7	0,2	16,2	16,5	0,3
186	Algeria	6,00	36,00	.0572318	7.01	11,6	12,1	0,5	11,8	0,3	11,7	0,3	11,6	0,5	11,8	12,9	1,1
187	Algeria	6,00	35,00	.0478471	6.43	22,2	22,7	0,5	22,4	0,4	22,1	0,6	22,0	0,8	22,4	23,3	0,9
188	Algeria	6,00	34,00	.0543632	7.78	21,6	21,9	0,3	21,7	0,2	21,5	0,4	21,3	0,6	21,7	22,6	0,9
189	Algeria	6,00	33,00	.052006	8.08	21,5	21,8	0,3	21,6	0,2	21,4	0,4	21,2	0,6	21,6	22,6	1,0
190	Algeria	6,00	32,00	.0473657	6.89	22,0	22,3	0,3	22,0	0,3	21,9	0,4	21,7	0,6	22,0	23,1	1,0
191	Algeria	6,00	31,00	.0527064	7.69	21,8	22,1	0,3	21,9	0,2	21,7	0,4	21,5	0,6	21,9	23,0	1,1
192	Algeria	6,00	30,00	.0622059	7.62	21,5	21,9	0,4	21,6	0,3	21,5	0,4	21,3	0,6	21,6	22,9	1,3
193	Algeria	6,00	29,00	.0592324	7.91	21,9	22,2	0,3	21,9	0,3	21,8	0,4	21,7	0,5	21,9	23,2	1,3
194	Algeria	6,00	28,00	.0495641	7.39	24,4	24,7	0,3	24,4	0,2	24,4	0,3	24,3	0,4	24,4	25,5	1,1
195	Algeria	6,00	27,00	.0382628	6.47	23,5	23,7	0,2	23,5	0,2	23,5	0,3	23,5	0,2	23,5	24,4	0,9
196	Algeria	6,00	26,00	.0300936	5.71	23,6	23,8	0,2	23,6	0,2	23,6	0,2	23,7	0,1	23,6	24,3	0,7
197	Algeria	6,00	25,00	.02621	5.18	24,6	24,8	0,2	24,6	0,2	24,6	0,2	24,7	0,1	24,6	25,2	0,6
198	Algeria	6,00	24,00	.0264197	5.10	21,3	21,5	0,2	21,3	0,2	21,2	0,3	21,5	0,1	21,3	21,9	0,6
199	Algeria	6,00	23,00	.032292	6.20	20,6	21,0	0,4	20,6	0,4	20,5	0,4	20,8	0,2	20,6	21,4	0,9
200	Algeria	6,00	22,00	.0282799	5.54	25,8	26,0	0,2	25,6	0,4	25,6	0,4	25,9	0,1	25,6	26,4	0,8

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
201	Algeria	6,00	21,00	.0305586	6.20	26,5	26,8	0,3	26,3	0,4	26,3	0,4	26,6	0,2	26,3	27,2	0,9
202	Algeria	6,00	20,00	.0381096	7.51	27,8	28,2	0,4	27,6	0,6	27,6	0,6	27,9	0,3	27,6	28,9	1,2
203	Algeria	6,00	19,00	.0475663	7.58	28,7	29,2	0,5	28,4	0,8	28,4	0,8	28,7	0,4	28,4	30,1	1,7
204	Algeria	7,00	37,00	.0453833	6.94	16,4	16,5	0,1	16,7	-0,2	16,5	0,0	16,2	0,3	16,7	17,2	0,5
205	Algeria	7,00	36,00	.0709815	9.17	15,0	15,4	0,4	15,2	0,2	15,0	0,4	14,9	0,5	15,2	16,6	1,5
206	Algeria	7,00	35,00	.0602756	8.38	21,0	21,5	0,5	21,2	0,3	21,0	0,5	20,9	0,6	21,2	22,4	1,3
207	Algeria	7,00	34,00	.051758	7.35	21,6	21,8	0,2	21,7	0,1	21,5	0,3	21,3	0,5	21,7	22,5	0,8
208	Algeria	7,00	33,00	.0500091	7.80	21,6	21,9	0,3	21,6	0,2	21,5	0,3	21,3	0,5	21,6	22,6	1,0
209	Algeria	7,00	32,00	.0433928	6.55	22,3	22,6	0,3	22,3	0,3	22,3	0,3	22,1	0,5	22,3	23,3	1,0
210	Algeria	7,00	31,00	.0524373	7.31	22,5	22,8	0,3	22,5	0,3	22,4	0,4	22,2	0,6	22,5	23,7	1,2
211	Algeria	7,00	30,00	.0652579	6.56	22,0	22,4	0,4	22,0	0,5	21,9	0,5	21,7	0,7	22,0	23,5	1,5
212	Algeria	7,00	29,00	.0571051	7.48	23,6	24,0	0,4	23,6	0,4	23,6	0,5	23,4	0,6	23,6	24,9	1,3
213	Algeria	7,00	28,00	.044653	7.01	24,7	25,0	0,3	24,7	0,3	24,6	0,4	24,6	0,4	24,7	25,8	1,1
214	Algeria	7,00	27,00	.0314714	5.46	23,7	24,0	0,3	23,7	0,3	23,7	0,3	23,8	0,2	23,7	24,6	0,8
215	Algeria	7,00	26,00	.0232702	4.33	21,9	22,2	0,3	21,9	0,2	21,9	0,3	22,1	0,1	21,9	22,6	0,7
216	Algeria	7,00	25,00	.0197213	3.86	23,0	23,3	0,3	23,0	0,3	23,0	0,3	23,2	0,1	23,0	23,6	0,6
217	Algeria	7,00	24,00	.0216836	4.33	19,6	19,9	0,3	19,6	0,3	19,6	0,3	19,9	0,1	19,6	20,3	0,7
218	Algeria	7,00	23,00	.0249827	4.99	23,6	23,9	0,3	23,6	0,4	23,6	0,4	23,8	0,1	23,6	24,3	0,8
219	Algeria	7,00	22,00	.0263313	5.47	25,8	26,1	0,3	25,7	0,4	25,7	0,4	26,0	0,1	25,7	26,5	0,8
220	Algeria	7,00	21,00	.03193	6.73	26,7	27,1	0,4	26,6	0,5	26,6	0,5	26,9	0,2	26,6	27,6	1,0
221	Algeria	7,00	20,00	.043235	8.00	28,0	28,4	0,4	27,8	0,7	27,8	0,7	28,1	0,4	27,8	29,2	1,5
222	Algeria	8,00	36,00	.0632637	9.05	15,8	16,1	0,3	15,9	0,2	15,7	0,3	15,6	0,5	15,9	17,1	1,2
223	Algeria	8,00	35,00	.0552668	8.17	15,9	16,1	0,2	15,9	0,2	15,8	0,4	15,6	0,5	15,9	17,1	1,1
224	Algeria	8,00	34,00	.0467128	7.18	21,5	21,8	0,3	21,5	0,3	21,4	0,5	21,2	0,6	21,5	22,6	1,0
225	Algeria	8,00	33,00	.0521985	8.19	21,3	21,6	0,3	21,2	0,3	21,2	0,4	21,0	0,6	21,2	22,4	1,1
226	Algeria	8,00	32,00	.0510012	8.26	23,6	23,9	0,3	23,6	0,3	23,6	0,4	23,4	0,5	23,6	24,7	1,1
227	Algeria	8,00	31,00	.0553005	8.84	22,7	23,1	0,4	22,6	0,5	22,6	0,4	22,5	0,6	22,6	23,9	1,3
228	Algeria	8,00	30,00	.0587592	8.69	22,3	22,8	0,5	22,3	0,6	22,3	0,5	22,2	0,6	22,3	23,7	1,4
229	Algeria	8,00	29,00	.052741	8.65	22,9	23,4	0,5	22,9	0,5	22,9	0,5	22,8	0,6	22,9	24,1	1,3
230	Algeria	8,00	28,00	.0402159	7.03	23,7	24,1	0,4	23,7	0,4	23,7	0,4	23,7	0,4	23,7	24,7	1,1
231	Algeria	8,00	27,00	.0261699	4.22	24,1	24,4	0,3	24,0	0,3	24,1	0,3	24,2	0,2	24,0	24,9	0,9
232	Algeria	8,00	26,00	.0184666	3.15	21,1	21,5	0,4	21,1	0,3	21,2	0,3	21,4	0,1	21,1	21,9	0,7
233	Algeria	8,00	25,00	.0118175	2.16	22,1	22,5	0,4	22,2	0,3	22,2	0,3	22,5	0,0	22,2	22,7	0,6
234	Algeria	8,00	24,00	.0108464	2.05	22,3	22,7	0,4	22,3	0,3	22,4	0,3	22,7	0,0	22,3	22,9	0,5
235	Algeria	8,00	23,00	.015525	3.15	23,2	23,6	0,4	23,2	0,4	23,2	0,3	23,5	0,0	23,2	23,8	0,7
236	Algeria	8,00	22,00	.0203569	4.36	26,1	26,4	0,3	25,9	0,4	26,0	0,4	26,3	0,1	25,9	26,7	0,8
237	Algeria	8,00	21,00	.0303471	6.40	26,8	27,2	0,4	26,6	0,5	26,6	0,5	26,9	0,2	26,6	27,7	1,1
238	Algeria	9,00	32,00	.0535142	7.55	24,1	24,3	0,2	24,0	0,3	24,0	0,3	23,9	0,4	24,0	25,1	1,1
239	Algeria	9,00	31,00	.0588522	9.12	22,8	23,2	0,4	22,7	0,6	22,8	0,5	22,6	0,6	22,7	24,0	1,3
240	Algeria	9,00	30,00	.0562744	9.27	22,5	23,1	0,6	22,5	0,7	22,6	0,6	22,5	0,7	22,5	23,8	1,3
241	Algeria	9,00	29,00	.0499827	9.67	21,7	22,2	0,5	21,6	0,5	21,7	0,4	21,7	0,5	21,6	22,8	1,2
242	Algeria	9,00	28,00	.039812	7.58	22,3	22,7	0,4	22,2	0,4	22,3	0,4	22,3	0,4	22,2	23,3	1,0
243	Algeria	9,00	27,00	.0259273	4.21	24,9	25,2	0,3	24,8	0,4	24,9	0,3	25,0	0,2	24,8	25,7	0,9
244	Algeria	9,00	26,00	.0153618	2.60	23,3	23,7	0,4	23,3	0,4	23,4	0,3	23,6	0,1	23,3	24,1	0,7
245	Algeria	9,00	25,00	.0049723	0.84	23,0	23,3	0,3	23,0	0,3	23,0	0,3	23,4	-0,1	23,0	23,5	0,5
246	Algeria	9,00	24,00	-.0051319	-0.78	24,4	24,7	0,3	24,4	0,2	24,5	0,2	24,9	-0,2	24,4	24,7	0,3
247	Algeria	9,00	23,00	.0045364	0.81	24,1	24,4	0,3	24,1	0,3	24,1	0,3	24,5	-0,1	24,1	24,5	0,5
248	Algeria	9,00	22,00	.0137725	2.77	24,2	24,5	0,3	24,1	0,4	24,2	0,3	24,5	0,0	24,1	24,8	0,7
249	Algeria	9,00	21,00	.0257249	5.13	26,3	26,6	0,3	26,1	0,5	26,2	0,5	26,5	0,2	26,1	27,2	1,0
250	Algeria	10,00	25,00	.0070476	1.25	21,3	21,7	0,4	21,3	0,4	21,4	0,3	21,7	0,0	21,3	21,9	0,6
251	Algeria	10,00	24,00	-.0135865	-1.82	24,6	24,8	0,2	24,6	0,2	24,7	0,1	25,1	-0,3	24,6	24,7	0,1
252	Algeria	10,00	23,00	-.0022249	-0.36	25,0	25,3	0,3	25,0	0,3	25,1	0,2	25,4	-0,2	25,0	25,4	0,4
253	Algeria	10,00	22,00	.0080616	1.49	25,9	26,2	0,3	25,8	0,3	25,9	0,3	26,2	0,0	25,8	26,4	0,6
254	Algeria	11,00	24,00	-.0023735	-0.38	23,6	23,9	0,3	23,6	0,3	23,7	0,2	24,0	-0,1	23,6	24,0	0,4
255	Algeria	11,00	23,00	.0001049	0.02	25,2	25,5	0,3	25,2	0,3	25,3	0,2	25,6	-0,1	25,2	25,6	0,4
256	Algeria	11,00	22,00	.0062972	1.14	26,4	26,7	0,3	26,4	0,3	26,5	0,2	26,7	-0,1	26,4	26,9	0,5
257	Egypt			.0357167	8.41	22,0	22,3	0,3	22,0	0,3	21,9	0,4	21,9	0,4	22,0	22,8	0,9
258	Egypt	24,00	30,00	.024295	6.11	21,3	21,7	0,4	21,2	0,4	21,2	0,5	21,1	0,6	21,2	21,8	0,6
259	Egypt	24,00	29,00	.0256118	6.24	21,3	21,6	0,3	21,2	0,4	21,1	0,5	21,0	0,6	21,2	21,8	0,6
260	Egypt	25,00	31,00	.0146787	3.90	19,6	19,9	0,3	19,5	0,4	19,5	0,4	19,6	0,3	19,5	19,9	0,4
261	Egypt	25,00	30,00	.0228081	5.04	21,6	21,9	0,3	21,5	0,4	21,5	0,5	21,3	0,6	21,5	22,1	0,5
262	Egypt	25,00	29,00	.0197674	4.25	21,0	21,3	0,3	20,9	0,4	20,9	0,4	20,7	0,6	20,9	21,4	0,5
263	Egypt	25,00	28,00	.0295019	5.87	20,9	21,3	0,4	20,9	0,4	20,8	0,5	20,7	0,6	20,9	21,6	0,7
264	Egypt	25,00	27,00	.0423473	7.37	21,7	22,1	0,4	21,6	0,5	21,6	0,5	21,5	0,6	21,6	22,7	1,0
265	Egypt	25,00	26,00	.0514916	8.22	22,7	23,2	0,5	22,6	0,5	22,6	0,6	22,6	0,6	22,6	23,9	1,2
266	Egypt	25,00	25,00	.0564109	8.84	23,3	23,8	0,5	23,2	0,6	23,2	0,6	23,2	0,6	23,2	24,6	1,4
267	Egypt	25,00	24,00	.0580936	9.49	21,4	21,9	0,5	21,4	0,6	21,3	0,6	21,4	0,6	21,4	22,8	1,4
268	Egypt	25,00	23,00	.0581483	10.07	19,5	20,1	0,6	19,5	0,6	19,5	0,6	19,5	0,6	19,5	21,0	1,4
269	Egypt	25,00	22,00	.0573177	10.29	20,2	20,7	0,5	20,2	0,5	20,1	0,6	20,2	0,5	20,2	21,6	1,4
270	Egypt	26,00	31,00	.0147105	4.19	18,8	19,1	0,3	18,7	0,4	18,7	0,4	18,8	0,3	18,7	19,2	0,5
271	Egypt	26,00	30,00	.0158861	4.03	20,5	20,8	0,3	20,5	0,3	20,5	0,3	20,5	0,3	20,5	20,9	0,4
272	Egypt	26,00	29,00	.0172156	3.62	21,1	21,3	0,2	21,1	0,3	21,1	0,3	21,0	0,3	21,1	21,4	0,4
273	Egypt	26,00	28,00	.0316857	5.65	20,9	21,2	0,3	20,8	0,4	20,8	0,5	20,8	0,5	20,8	21,6	0,8
274	Egypt	26,00	27,00	.0457223	7.05	21,3	21,7	0,4	21,2	0,5	21,1	0,5	21,2	0,5	21,2	22,3	1,1
275	Egypt	26,00	26,00	.0548835	8.37	21,9	22,3	0,4	21,8	0,5	21,8	0,5	21,8	0,5	21,8	23,1	1,3
276	Egypt	26,00	25,00	.0573198	9.44	22,2	22,6	0,4	22,1	0,5	22,1	0,6	22,1	0,5	22,1	23,5	1,4
277	Egypt	26,00	24,00	.0576817	10.36	19,1	19,6	0,5	19,0	0,5	19,0	0,6	19,0	0,6	19,0	20,4	1,4
278	Egypt	26,00	23,00	.0573468	10.79	20,2	20,8	0,6	20,2	0,6	20,2	0,6	20,2	0,6	20,2	21,7	1,4
279	Egypt	26,00	22,00	.0567438	10.73	21,1	21,7	0,6	21,1	0,5	21,1	0,6	21,2	0,5	21,1	22,5	1,4
280	Egypt	27,00	31,00	.0205406	6.11	18,5	18,7	0,2	18,4	0,3	18,4	0,3	18,5	0,2	18,4	19,0	0,6
281	Egypt	27,00	30,00	.0200011	5.74	21,4	21,6	0,2	21,3	0,3	21,3	0,3	21,4	0,2	21,3	21,9	0,5
282	Egypt	27,00	29,00	.025553	5.69	21,2	21,4	0,2	21,1	0,3	21,1	0,4	21,2	0,3	21,1	21,8	0,7
283	Egypt	27,00	28,00	.040537	6.11	20,9	21,3	0,4	20,9	0,4	20,8	0,5	20,9	0,4	20,9	22,0	1,1
284	Egypt	27,00	27,00	.0556816	6.90	20,2	20,6	0,4	20,1	0,5	20,0	0,5	20,1	0,5	20,1	21,5	1,4
285	Egypt	27,00	26,00	.0597493	8.74	20,9	21,3	0,4	20,8	0,4	20,8	0,5	20,8	0,5	20,8	22,2	1,4
286	Egypt	27,00	25,00	.0575689	10.13	20,0	20,3	0,3	19,9	0,4	19,8	0,5	19,8	0,6	19,9	21,2	1,3
287	Egypt	27,00	24,00	.0562299	10.98	20,8	21,3	0,5	20,8	0,5	20,7	0,5	20,7	0,6	20,8	22,1	1,3
288	Egypt	27,00	23,00	.0553534	11.19	21,8	22,3	0,5	21,8	0,5	21,7	0,6	21,7	0,6	21,8	23,1	1,4
289	Egypt	27,00	22,00	.0550766	10.82	22,4	23,0	0,6	22,5	0,5	22,4	0,5	22,5	0,5	22,5	23,8	1,4
290	Egypt	28,00	31,00	.0217291	6.10	18,8	18,9	0,1	18,7	0,2	18,6	0,3	18,8	0,1	18,7	19,3	0,6
291	Egypt	28,00	30,00	.0232248	6.61	20,9	21,1	0,2	20,9	0,2	20,8	0,4	20,9	0,2	20,9	21,5	0,6
292	Egypt	28,00	29,00	.0298375	6.65	21,6	21,9	0,3	21,5	0,3	21,4	0,5	21,6	0,3	21,5	22,4	0,9
293	Egypt	28,00	28,00	.0485685	6.13	21,0	21,3	0,3	20,9	0,5	20,8	0,6	21,0	0,3	20,9	22,3	1,4
294	Egypt	28,00	27,00	.0665181	6.43	21,3	21,7	0,4	21,2	0,5	21,1	0,6	21,3	0,4	21,2	22,9	1,7
295	Egypt	28,00	26,00	.060457	9.59	21,2	21,4	0,2	21,1	0,4	21,0	0,5	20,9	0,5	21,1	22,4	1,3
296	Egypt	28,00	25,00	.0567951	10.97	21,0	21,3	0,3	20,9	0,4	20,8	0,4	20,7	0,5	20,9	22,1	1,2
297	Egypt	28,00	24,00	.0531096	10.96	21,2	21,6	0,4	21,1	0,4	21,1	0,5	21,0	0,6	21,1	22,4	1,2
298	Egypt	28,00	23,00	.0520832	10.79	22,9	23,4	0,5	22,9	0,5	22,8	0,5	22,8	0,6	22,9	24,2	1,3
299	Egypt	28,00	22,00	.0524951	10.29	24,3	24,8	0,5	24,3	0,5	24,3	0,5	24,4	0,5	24,3	25,7	1,4
300	Egypt	29,00	31,00	.0210707	5.58	20,4	20,3	-0,1	20,3	0,0	20,1	0,2	20,3	0,0	20,3	20,7	0,4
301	Egypt	29,00	30,00	.0245023	6.36	20,7	20,9	0,2	20,7	0,2	20,5	0,4	20,6	0,2	20,7	21,3	0,7
302	Egypt	29,00	29,00	.0266213	6.36	21,5	21,7	0,2	21,4	0,3	21,2	0,5	21,5	0,2	21,4	22,2	0,8
303	Egypt	29,00	28,00	.0374375	6.51	21,1	21,3	0,2	21,0	0,4	20,8	0,5	21,1	0,2	21,0	22,0	1,1
304	Egypt	29,00	27,00	.0547909	7.36	21,7	21,9	0,2	21,5	0,4	21,5	0,5	21,6	0,4	21,5	22,9	1,4
305	Egypt	29,00	26,00	.0584441	11.54	22,0	22,1	0,1	21,8	0,3	21,7	0,4	21,6	0,5	21,8	22,9	1,1
306	Egypt	29,00	25,00	.0538274	11.41	21,6	21,8	0,2	21,5	0,3	21,4	0,4	21,2	0,5	21,5	22,6	1,1
307	Egypt	29,00	24,00	.0490648	10.32	22,6	22,9	0,3	22,5	0,4	22,4	0,5	22,4	0,6	22,5	23,7	1,2
308	Egypt	29,00	23,00	.0491775	9.96	24,5	24,9	0,4	24,5	0,5	24,4	0,6	24,4	0,5	24,5	25,8	1,3
309	Egypt	29,00	22,00	.0503768	9.51	25,1	25,6	0,5	25,1	0,5	25,1	0,5	25,2	0,5	25,1	26,5	1,4
310	Egypt	30,00	31,00	.0143296	2.57	21,4	21,3	-0,1	21,3	0,0	21,1	0,2	21,2	0,1	21,3	21,5	0,2
311	Egypt	30,00	30,00	.0296356	6.28	20,7	20,8	0,1	20,6	0,2	20,4	0,4	20,5	0,3	20,6	21,4	0,8
312	Egypt	30,00	29,00	.0272952	6.35	21,1	21,2	0,1	21,0	0,2	20,8	0,4	21,0	0,3	21,0	21,8	0,8
313	Egypt	30,00	28,00	.0302616	6.36	21,5	21,6	0,1	21,4	0,2	21,2	0,4	21,4	0,2	21,4	22,1	0,8
314	Egypt	30,00	27,00	.0366644	7.17	21,6	21,7	0,1	21,5	0,2	21,4	0,3	21,5	0,2	21,5	22,4	0,8
315	Egypt	30,00	26,00	.0431718	8.80	21,4	21,6	0,2	21,2	0,4	21,2	0,4	21,1	0,5	21,2	22,2	1,0
316	Egypt	30,00	25,00	.0433238	9.02	22,4	22,7	0,3	22,3	0,4	22,2	0,5	22,2	0,5	22,3	23,4	1,0
317	Egypt	30,00	24,00	.0427444	8.75	23,6	23,9	0,3	23,5	0,4	23,5	0,5	23,4	0,5	23,5	24,6	1,1
318	Egypt	30,00	23,00	.0464556	8.85	25,3	25,8	0,5	25,3	0,5	25,3	0,6	25,3	0,6	25,3	26,6	1,3
319	Egypt	30,00	22,00	.0492039	8.77	25,0	25,6	0,6	25,1	0,6	25,0	0,6	25,1	0,5	25,1	26,5	1,4
320	Egypt	31,00	31,00	.0251965	5.59	20,6	20,8	0,2	20,6	0,2	20,4	0,4	20,4	0,4	20,6	21,3	0,7

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
321	Egypt	31,00	30,00	.0255632	5.98	20,4	20,6	0,2	20,4	0,2	20,2	0,4	20,2	0,4	20,4	21,1	0,8
322	Egypt	31,00	29,00	.0261297	5.98	21,6	21,6	0,0	21,4	0,2	21,2	0,4	21,3	0,3	21,4	22,1	0,7
323	Egypt	31,00	28,00	.0261581	5.57	22,0	22,0	0,0	21,9	0,1	21,8	0,2	21,8	0,2	21,9	22,5	0,6
324	Egypt	31,00	27,00	.022093	4.37	21,9	21,8	-0,1	21,9	-0,1	21,8	0,0	22,0	-0,1	21,9	22,1	0,2
325	Egypt	31,00	26,00	.0282284	4.81	23,4	23,8	0,4	23,3	0,5	23,3	0,6	23,4	0,4	23,3	24,3	0,9
326	Egypt	31,00	25,00	.0318113	5.97	22,0	22,4	0,4	22,0	0,4	21,9	0,5	22,0	0,4	22,0	22,9	0,9
327	Egypt	31,00	24,00	.0371006	7.35	24,6	24,9	0,3	24,6	0,4	24,5	0,4	24,5	0,5	24,6	25,5	1,0
328	Egypt	31,00	23,00	.0434331	7.56	26,0	26,6	0,6	26,0	0,6	26,0	0,6	26,0	0,6	26,0	27,3	1,3
329	Egypt	31,00	22,00	.0498953	7.99	24,7	25,6	0,9	24,9	0,7	24,9	0,8	25,0	0,6	24,9	26,5	1,6
330	Egypt	32,00	31,00	.0160886	4.19	21,0	20,9	-0,1	20,8	0,1	20,6	0,3	20,5	0,4	20,8	21,2	0,4
331	Egypt	32,00	30,00	.0210977	5.01	18,8	18,9	0,1	18,7	0,2	18,5	0,3	18,5	0,4	18,7	19,4	0,7
332	Egypt	32,00	29,00	.0234496	5.51	20,6	20,6	0,0	20,5	0,1	20,4	0,2	20,4	0,2	20,5	21,1	0,6
333	Egypt	32,00	28,00	.0218904	4.92	21,0	20,9	-0,1	21,0	0,0	20,9	0,1	20,9	0,0	21,0	21,3	0,4
334	Egypt	32,00	27,00	.021255	4.66	20,9	20,9	0,0	20,9	0,0	20,9	0,0	21,0	-0,1	20,9	21,2	0,3
335	Egypt	32,00	26,00	.0258265	5.92	21,8	22,0	0,2	21,8	0,2	21,7	0,3	21,8	0,2	21,8	22,5	0,7
336	Egypt	32,00	25,00	.0294304	6.09	22,4	22,5	0,1	22,4	0,1	22,3	0,2	22,2	0,3	22,4	23,0	0,6
337	Egypt	32,00	24,00	.0337284	6.20	24,7	24,8	0,1	24,7	0,1	24,6	0,2	24,5	0,3	24,7	25,4	0,7
338	Egypt	32,00	23,00	.0383289	6.33	25,7	26,2	0,5	25,8	0,4	25,7	0,5	25,7	0,5	25,8	26,9	1,1
339	Egypt	32,00	22,00	.047796	7.53	24,8	25,7	0,9	24,9	0,7	24,9	0,7	25,0	0,6	24,9	26,5	1,6
340	Egypt	33,00	31,00	.0154998	3.95	21,2	21,0	-0,2	21,1	-0,1	20,9	0,1	20,9	0,1	21,1	21,3	0,2
341	Egypt	33,00	30,00	.0216467	5.08	22,1	22,1	0,0	22,0	0,1	21,9	0,2	21,8	0,2	22,0	22,6	0,6
342	Egypt	33,00	29,00	.0219222	4.94	23,1	23,2	0,1	23,1	0,1	23,0	0,2	23,0	0,2	23,1	23,7	0,6
343	Egypt	33,00	28,00	.0143215	3.51	21,5	21,5	0,0	21,6	0,0	21,5	0,1	21,5	0,0	21,6	21,8	0,3
344	Egypt	33,00	27,00	.0172798	4.43	23,2	23,2	0,0	23,1	0,1	23,1	0,2	23,2	0,0	23,1	23,6	0,4
345	Egypt	33,00	26,00	.0261175	5.40	24,7	24,8	0,1	24,6	0,2	24,6	0,2	24,6	0,2	24,6	25,4	0,7
346	Egypt	33,00	25,00	.0301029	5.88	24,6	24,5	-0,1	24,6	-0,1	24,4	0,1	24,3	0,2	24,6	25,0	0,5
347	Egypt	33,00	24,00	.0340768	5.60	26,3	26,1	-0,2	26,3	-0,2	26,1	0,0	25,9	0,2	26,3	26,6	0,3
348	Egypt	33,00	23,00	.0375328	6.39	26,0	26,2	0,2	26,0	0,2	25,9	0,3	25,8	0,4	26,0	26,8	0,8
349	Egypt	33,00	22,00	.0408665	6.76	25,2	25,7	0,5	25,2	0,5	25,2	0,5	25,2	0,5	25,2	26,4	1,2
350	Egypt	34,00	31,00	.0180948	3.71	19,6	19,4	-0,2	19,5	-0,2	19,5	-0,1	19,5	-0,2	19,5	19,7	0,2
351	Egypt	34,00	30,00	.0249196	5.04	17,6	17,6	0,0	17,6	0,0	17,5	0,1	17,6	0,1	17,6	18,2	0,6
352	Egypt	34,00	29,00	.0155093	3.35	18,2	18,1	-0,1	18,2	0,0	18,1	0,0	18,1	0,0	18,2	18,5	0,3
353	Egypt	34,00	28,00	.0085103	1.82	22,7	22,7	0,0	22,7	-0,1	22,6	0,0	22,7	0,0	22,7	22,9	0,1
354	Egypt	34,00	27,00	.0099479	2.51	22,6	22,6	0,0	22,6	0,0	22,5	0,1	22,6	0,0	22,6	22,8	0,2
355	Egypt	34,00	26,00	.0198026	5.08	22,7	22,7	0,0	22,7	0,0	22,6	0,1	22,7	0,0	22,7	23,0	0,3
356	Egypt	34,00	25,00	.0297531	6.10	23,9	23,8	-0,1	23,9	-0,1	23,8	0,1	23,6	0,2	23,9	24,4	0,5
357	Egypt	34,00	24,00	.0342409	5.97	24,4	24,2	-0,2	24,4	-0,1	24,2	0,0	24,0	0,2	24,4	24,8	0,5
358	Egypt	34,00	23,00	.0362268	6.23	24,0	24,1	0,1	24,0	0,1	23,9	0,2	23,8	0,3	24,0	24,7	0,7
359	Egypt	34,00	22,00	.0369858	6.23	26,1	26,4	0,3	26,1	0,3	26,0	0,4	26,0	0,4	26,1	27,1	1,0
360	Egypt	35,00	24,00	.0329336	6.29	23,7	23,6	-0,1	23,6	-0,1	23,5	0,1	23,4	0,2	23,6	24,2	0,5
361	Egypt	35,00	23,00	.0343732	6.06	23,5	23,5	0,0	23,5	0,0	23,4	0,1	23,2	0,3	23,5	24,1	0,6
362	Egypt	35,00	22,00	.0329228	5.95	24,9	25,1	0,2	24,9	0,2	24,8	0,3	24,7	0,4	24,9	25,7	0,9
363	Egypt	36,00	22,00	.0287105	5.50	24,7	24,8	0,1	24,7	0,2	24,6	0,3	24,5	0,3	24,7	25,4	0,7
364	Israel			.0221745	4.25	20,0	19,8	-0,2	19,9	-0,1	19,9	-0,1	19,9	-0,1	19,9	20,2	0,3
365	Israel	34,00	31,00	.0213389	4.06	19,6	19,4	-0,2	19,5	-0,1	19,5	-0,1	19,5	-0,2	19,5	19,7	0,3
366	Israel	34,00	30,00	.0299522	5.62	17,6	17,6	0,0	17,6	0,0	17,6	0,1	17,6	0,0	17,6	18,2	0,6
367	Israel	34,00	29,00	.0189682	3.74	18,2	18,2	0,0	18,2	0,0	18,1	0,0	18,2	0,0	18,2	18,5	0,3
368	Israel	34,25	32,00	.032965	4.80	20,1	19,9	-0,2	20,0	0,0	19,9	0,0	19,9	0,0	20,0	20,4	0,5
369	Israel	35,00	32,00	.0399032	6.27	20,5	20,5	0,0	20,4	0,2	20,4	0,1	20,4	0,1	20,4	21,3	0,9
370	Israel	35,00	31,00	.0186764	3.16	18,4	18,3	-0,1	18,3	0,0	18,3	0,0	18,3	0,0	18,3	18,6	0,3
371	Israel	35,00	30,00	.0100038	1.57	20,3	20,1	-0,2	20,3	-0,2	20,4	-0,2	20,4	-0,3	20,3	20,2	-0,2
372	Israel	35,00	29,00	.0126463	2.44	25,3	25,2	-0,1	25,3	-0,1	25,3	-0,1	25,3	-0,2	25,3	25,4	0,1
373	Israel	35,25	33,00	.0151165	2.11	19,9	19,5	-0,4	19,8	-0,3	19,8	-0,4	19,7	-0,2	19,8	19,9	0,1
374	Jordanie			.0455685	4.82	19,3	19,3	0,0	19,3	0,0	19,1	0,2	19,1	0,2	19,3	19,6	0,4
375	Jordan	34,00	29,00	.0393315	4.90	18,2	18,2	0,0	18,1	0,1	18,1	0,1	18,0	0,2	18,1	18,5	0,4
376	Jordan	35,00	32,00	.0737383	8.36	20,5	20,7	0,2	20,3	0,3	20,3	0,4	20,2	0,4	20,3	21,3	1,0
377	Jordan	35,00	31,00	.031339	3.29	18,3	18,3	0,0	18,2	0,1	18,2	0,2	18,2	0,2	18,2	18,6	0,4
378	Jordan	35,00	30,00	.0195411	1.65	20,3	20,1	-0,2	20,2	-0,1	20,2	0,0	20,1	0,1	20,2	20,2	-0,1
379	Jordan	35,00	29,00	.0293549	3.52	25,3	25,2	-0,1	25,2	0,0	25,2	0,0	25,1	0,1	25,2	25,4	0,2
380	Jordan	36,00	32,00	.0567155	6.01	17,2	17,1	-0,1	17,1	0,1	16,9	0,2	16,8	0,3	17,1	17,6	0,5
381	Jordan	36,00	31,00	.041687	4.19	16,2	16,1	-0,1	16,1	0,0	15,9	0,1	15,9	0,2	16,1	16,4	0,3
382	Jordan	36,00	30,00	.0503561	4.99	18,2	18,2	0,0	18,1	0,1	18,0	0,1	17,9	0,2	18,1	18,5	0,4
383	Jordan	36,00	29,00	.049827	5.12	18,6	18,5	-0,1	18,5	0,0	18,5	0,1	18,3	0,2	18,5	18,9	0,4
384	Jordan	37,00	32,00	.0461488	4.62	19,7	19,6	-0,1	19,6	0,0	19,4	0,2	19,3	0,3	19,6	20,0	0,3
385	Jordan	37,00	31,00	.0457061	4.54	18,1	18,0	-0,1	18,0	0,0	17,8	0,2	17,8	0,2	18,0	18,3	0,3
386	Jordan	37,00	30,00	.0515263	5.15	18,6	18,6	0,0	18,6	0,0	18,5	0,1	18,4	0,2	18,6	19,0	0,4
387	Jordan	37,00	29,00	.0600275	5.39	21,5	21,5	0,0	21,5	0,0	21,4	0,0	21,3	0,2	21,5	22,0	0,5
388	Jordan	38,00	33,00	.0542531	4.79	19,2	19,3	0,1	19,1	0,1	18,9	0,4	18,8	0,4	19,1	19,7	0,6
389	Jordan	38,00	32,00	.0458842	4.13	18,5	18,4	-0,1	18,4	0,0	18,2	0,2	18,2	0,3	18,4	18,7	0,3
390	Jordan	38,00	31,00	.0411986	3.55	21,6	21,5	-0,1	21,5	0,0	21,4	0,1	21,3	0,2	21,5	21,8	0,2
391	Jordan	39,00	32,00	.0380291	2.40	18,8	18,8	0,0	18,8	0,0	18,6	0,2	18,5	0,2	18,8	19,0	0,3
392	Lebanon			.0329787	5.43	17,5	17,3	-0,2	17,3	0,0	17,3	0,0	17,2	0,2	17,3	17,9	0,6
393	Lebanon	35,25	34,00	.0305259	4.83	20,4	20,2	-0,2	20,1	0,0	20,2	0,0	19,9	0,2	20,1	20,7	0,6
394	Lebanon	35,25	33,00	.0156986	2.08	19,9	19,5	-0,4	19,7	-0,3	19,7	-0,3	19,6	-0,1	19,7	19,9	0,2
395	Lebanon	36,00	34,00	.0544018	7.93	9,5	9,6	0,1	9,1	0,5	9,2	0,4	9,1	0,5	9,1	10,2	1,1
396	Lebanon	36,00	33,00	.0312885	4.64	20,3	20,1	-0,2	20,2	-0,1	20,3	-0,1	20,1	0,1	20,2	20,6	0,4
397	Morocco			.0241192	4.98	19,1	19,2	0,1	19,2	0,0	19,1	0,0	19,0	0,1	19,2	19,6	0,5
398	Morocco	-17,00	22,00	.0163167	2.41	20,5	20,2	-0,3	20,6	-0,4	20,6	-0,4	20,5	-0,3	20,6	20,6	0,0
399	Morocco	-17,00	21,00	.0161352	2.20	20,5	20,1	-0,4	20,6	-0,5	20,6	-0,5	20,6	-0,5	20,6	20,6	0,0
400	Morocco	-16,00	23,00	.0146711	2.38	20,1	20,1	0,0	20,1	-0,1	20,1	0,0	20,0	0,1	20,1	20,4	0,2
401	Morocco	-16,00	22,00	.015417	2.46	19,8	19,7	-0,1	19,9	-0,3	19,9	-0,3	19,9	-0,2	19,9	20,0	0,1
402	Morocco	-16,00	21,00	.0155884	2.35	21,4	21,2	-0,2	21,6	-0,4	21,6	-0,4	21,6	-0,4	21,6	21,6	0,0
403	Morocco	-15,00	25,00	.0103259	1.76	20,1	20,2	0,1	20,1	0,2	20,0	0,2	20,0	0,3	20,1	20,4	0,3
404	Morocco	-15,00	24,00	.0080426	1.32	19,4	19,5	0,1	19,4	0,1	19,4	0,1	19,3	0,2	19,4	19,6	0,2
405	Morocco	-15,00	23,00	.0104651	1.74	18,9	19,0	0,1	18,9	0,0	18,9	0,1	18,8	0,1	18,9	19,2	0,2
406	Morocco	-15,00	22,00	.0134719	2.36	19,6	19,6	0,0	19,6	0,0	19,6	0,0	19,6	0,0	19,6	19,9	0,2
407	Morocco	-15,00	21,00	.0151762	2.65	24,7	24,7	0,0	24,7	0,0	24,7	0,0	24,7	0,0	24,7	25,0	0,3
408	Morocco	-14,00	27,00	.0217483	4.30	19,9	20,1	0,2	19,8	0,3	19,7	0,4	19,7	0,4	19,8	20,3	0,6
409	Morocco	-14,00	26,00	.0194803	3.79	19,3	19,5	0,2	19,2	0,3	19,2	0,3	19,2	0,4	19,2	19,7	0,5
410	Morocco	-14,00	25,00	.0130191	2.30	19,3	19,5	0,2	19,3	0,2	19,3	0,2	19,2	0,2	19,3	19,6	0,3
411	Morocco	-14,00	24,00	.0090762	1.44	21,8	21,9	0,1	21,8	0,1	21,8	0,1	21,8	0,2	21,8	22,0	0,2
412	Morocco	-14,00	23,00	.0110817	1.75	23,4	23,6	0,2	23,5	0,1	23,4	0,1	23,4	0,1	23,5	23,7	0,3
413	Morocco	-14,00	22,00	.0149477	2.54	26,7	27,0	0,3	26,8	0,2	26,7	0,2	26,8	0,2	26,8	27,2	0,4
414	Morocco	-14,00	21,00	.0183668	3.07	27,7	28,1	0,4	27,8	0,3	27,7	0,4	27,7	0,3	27,8	28,3	0,5
415	Morocco	-13,00	28,00	.011228	2.08	20,5	20,7	0,2	20,4	0,3	20,3	0,4	20,3	0,5	20,4	20,7	0,3
416	Morocco	-13,00	27,00	.0122128	2.24	20,4	20,6	0,2	20,3	0,3	20,2	0,3	20,2	0,4	20,3	20,6	0,3
417	Morocco	-13,00	26,00	.0153207	2.84	22,3	22,5	0,2	22,3	0,2	22,3	0,2	22,3	0,2	22,3	22,6	0,3
418	Morocco	-13,00	25,00	.0118699	2.02	23,1	23,2	0,1	23,1	0,1	23,1	0,1	23,1	0,1	23,1	23,3	0,2
419	Morocco	-13,00	24,00	.0108515	1.68	24,8	24,9	0,1	24,8	0,1	24,8	0,1	24,9	0,1	24,8	25,0	0,2
420	Morocco	-13,00	23,00	.013597	1.98	26,0	26,2	0,2	26,0	0,1	26,0	0,1	26,1	0,1	26,0	26,3	0,3
421	Morocco	-12,00	28,00	.0172463	3.65	19,1	19,2	0,1	19,0	0,2	18,9	0,3	18,8	0,4	19,0	19,4	0,5
422	Morocco	-12,00	27,00	.0129639	2.51	20,9	21,0	0,1	20,8	0,2	20,8	0,2	20,8	0,2	20,8	21,1	0,3
423	Morocco	-12,00	26,00	.0122434	2.15	22,8	22,9	0,1	22,8	0,1	22,8	0,1	22,9	0,0	22,8	23,0	0,2
424	Morocco	-11,00	29,00	.0155191	3.12	19,3	19,2	-0,1	19,2	0,1	19,1	0,2	19,0	0,3	19,2	19,5	0,3
425	Morocco	-11,00	28,00	.016127	3.18	20,0	20,0	0,0	19,9	0,1	19,8	0,2	19,7	0,2	19,9	20,2	0,3
426	Morocco	-11,00	27,00	.0145924	2.73	21,6	21,6	0,0	21,6	0,1	21,5	0,1	21,5	0,1	21,6	21,9	0,3
427	Morocco	-11,00	26,00	.0123825	2.15	23,0	23,0	0,0	23,0	0,1	23,0	0,0	23,1	0,0	23,0	23,2	0,2
428	Morocco	-10,00	30,00	.0211904	3.86	17,9	17,9	0,0	17,8	0,1	17,7	0,2	17,5	0,3	17,8	18,2	0,4
429	Morocco	-10,00	29,00	.0205309	3.85	17,6	17,6	0,0	17,5	0,1	17,4	0,2	17,2	0,3	17,5	17,9	0,4
430	Morocco	-10,00	28,00	.0206577	3.73	17,9	17,9	0,0	17,9	0,0	17,8	0,1	17,7	0,2	17,9	18,3	0,4
431	Morocco	-10,00	27,00	.0184725	3.24	21,5	21,5	0,0	21,5	0,0	21,5	0,1	21,4	0,1	21,5	21,9	0,4
432	Morocco	-10,00	26,00	.0149436	2.50	22,8	22,8	0,0	22,8	0,0	22,8	0,0	22,8	0,0	22,8	23,1	0,3
433	Morocco	-9,00	33,00	.0388155	6.64	18,8	18,3	-0,5	18,9	-0,6	18,8	-0,5	18,6	-0,3	18,9	19,2	0,4
434	Morocco	-9,00	32,00	.0342371	6.55	15,8	15,6	-0,2	15,8	-0,2	15,8	-0,2	15,6	0,0	15,8	16,2	0,3
435	Morocco	-9,00	31,00	.0236035	4.60	10,5	10,5	0,0	10,5	-0,1	10,5	0,0	10,3	0,2	10,5	10,8	0,2
436	Morocco	-9,00	30,00	.0213478	4.20	17,6	17,5	-0,1	17,6	0,0	17,5	0,1	17,3	0,2	17,6	17,9	0,3
437	Morocco	-9,00	29,00	.0252161	4.52	18,7	18,7	0,0	18,7	0,0	18,6	0,1	18,5	0,3	18,7	19,2	0,5
438	Morocco	-9,00	28,00	.0263237	4.19	21,6	21,6	0,0	21,6	0,0	21,5	0,1	21,4	0,2	21,6	22,2	0,6
439	Morocco	-9,00	27,00	.0219439	3.47	22,6	22,6	0,0	22,6	0,0	22,6	0,0	22,5	0,1	22,6	23,1	0,5
440	Morocco	-9,00	26,00	.0173902	2.76	23,3	23,3	0,0	23,3	0,0	23,3	0,0	23,3	0,0	23,3	23,7	0,4

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
441	Morocco	-8,00	33,00	.0364094	7.54	18,3	18,1	-0,2	18,4	-0,3	18,3	-0,2	18,1	0,0	18,4	18,8	0,5
442	Morocco	-8,00	32,00	.0421623	6.91	19,7	19,5	-0,2	19,7	-0,2	19,5	0,0	19,2	0,4	19,7	20,3	0,6
443	Morocco	-8,00	31,00	.0335477	6.54	16,0	15,9	-0,1	16,0	-0,1	15,9	0,0	15,6	0,3	16,0	16,5	0,5
444	Morocco	-8,00	30,00	.0285947	5.53	14,0	13,9	-0,1	14,0	-0,1	13,9	0,0	13,7	0,3	14,0	14,4	0,4
445	Morocco	-8,00	29,00	.0290574	4.81	21,6	21,6	0,0	21,6	0,0	21,5	0,0	21,3	0,2	21,6	22,2	0,6
446	Morocco	-7,00	34,00	.029926	6.42	16,6	16,6	0,0	16,7	-0,1	16,7	-0,1	16,6	0,0	16,7	17,2	0,4
447	Morocco	-7,00	33,00	.0364047	7.60	18,0	17,9	-0,1	18,1	-0,2	18,0	-0,1	17,8	0,1	18,1	18,6	0,5
448	Morocco	-7,00	32,00	.0390498	7.25	19,1	19,0	-0,1	19,2	-0,2	19,1	0,0	18,8	0,3	19,2	19,8	0,6
449	Morocco	-7,00	31,00	.0408181	6.85	15,8	15,9	0,1	15,9	0,0	15,8	0,1	15,5	0,3	15,9	16,7	0,8
450	Morocco	-7,00	30,00	.0340275	6.21	21,3	21,3	0,0	21,3	0,0	21,2	0,1	21,0	0,3	21,3	21,9	0,6
451	Morocco	-7,00	29,00	.029364	4.81	21,7	21,6	-0,1	21,7	-0,1	21,6	0,0	21,4	0,2	21,7	22,2	0,5
452	Morocco	-6,00	35,00	.02569	5.67	18,2	18,2	0,0	18,2	0,1	18,2	0,0	18,1	0,1	18,2	18,7	0,5
453	Morocco	-6,00	34,00	.0259308	5.61	17,7	17,7	0,0	17,7	0,0	17,7	0,0	17,6	0,1	17,7	18,2	0,5
454	Morocco	-6,00	33,00	.0454023	8.44	18,2	18,3	0,1	18,3	0,0	18,2	0,1	17,9	0,4	18,3	19,0	0,8
455	Morocco	-6,00	32,00	.036403	6.96	3,5	3,4	-0,1	3,5	-0,1	3,4	0,0	3,2	0,2	3,5	4,1	0,6
456	Morocco	-6,00	31,00	.0395924	6.77	17,9	17,9	0,0	17,9	0,0	17,8	0,1	17,6	0,3	17,9	18,7	0,8
457	Morocco	-6,00	30,00	.0364864	6.43	20,0	20,0	0,0	20,0	0,0	19,9	0,1	19,7	0,3	20,0	20,7	0,7
458	Morocco	-6,00	29,00	.0305139	5.00	20,5	20,5	0,0	20,5	0,0	20,5	0,0	20,3	0,2	20,5	21,1	0,6
459	Morocco	-5,00	35,00	.0290069	6.04	18,4	18,4	0,0	18,4	0,0	18,5	-0,1	18,3	0,1	18,4	18,9	0,5
460	Morocco	-5,00	34,00	.0267577	4.51	15,2	15,2	0,0	15,2	-0,1	15,3	-0,1	15,1	0,0	15,2	15,8	0,6
461	Morocco	-5,00	33,00	.0281583	4.93	12,9	12,8	-0,1	13,0	-0,2	13,0	-0,1	12,7	0,1	13,0	13,5	0,5
462	Morocco	-5,00	32,00	.0345601	6.29	16,4	16,4	0,0	16,4	0,0	16,4	0,0	16,2	0,2	16,4	17,1	0,7
463	Morocco	-5,00	31,00	.0366144	6.57	18,7	18,8	0,1	18,8	0,0	18,7	0,1	18,5	0,3	18,8	19,5	0,8
464	Morocco	-5,00	30,00	.0382129	6.76	18,6	18,8	0,2	18,7	0,1	18,6	0,2	18,4	0,3	18,7	19,5	0,9
465	Morocco	-4,00	35,00	.0245977	5.03	10,0	9,9	-0,1	10,0	-0,1	10,1	-0,2	9,9	0,0	10,0	10,3	0,3
466	Morocco	-4,00	34,00	.0284426	5.01	10,6	10,4	-0,2	10,6	-0,2	10,7	-0,3	10,5	-0,1	10,6	11,1	0,4
467	Morocco	-4,00	33,00	.023476	3.81	16,2	16,1	-0,1	16,3	-0,2	16,3	-0,2	16,1	0,0	16,3	16,8	0,5
468	Morocco	-4,00	32,00	.0336605	5.62	20,2	20,3	0,1	20,2	0,1	20,2	0,1	20,0	0,2	20,2	21,0	0,8
469	Morocco	-4,00	31,00	.0352226	6.14	22,1	22,3	0,2	22,2	0,1	22,1	0,1	22,0	0,3	22,2	23,0	0,9
470	Morocco	-4,00	30,00	.0409073	7.17	21,3	21,5	0,2	21,3	0,2	21,2	0,3	21,1	0,4	21,3	22,3	1,1
471	Morocco	-3,00	35,00	.0224518	4.45	17,0	16,9	-0,1	17,0	-0,1	17,0	-0,2	16,9	0,0	17,0	17,2	0,2
472	Morocco	-3,00	34,00	.0285606	5.56	13,8	13,6	-0,2	13,8	-0,2	13,9	-0,3	13,7	-0,1	13,8	14,2	0,4
473	Morocco	-3,00	33,00	.0271435	4.88	14,1	14,1	0,0	14,2	0,0	14,2	-0,1	14,0	0,1	14,2	14,8	0,6
474	Morocco	-3,00	32,00	.0268176	4.51	20,0	20,1	0,1	20,1	0,1	20,1	0,0	20,0	0,1	20,1	20,8	0,7
475	Morocco	-3,00	31,00	.0345825	5.92	21,4	21,6	0,2	21,4	0,2	21,4	0,2	21,3	0,3	21,4	22,4	1,0
476	Morocco	-2,00	34,00	.0343693	6.61	14,1	14,2	0,1	14,2	-0,1	14,3	-0,1	14,1	0,1	14,2	14,9	0,7
477	Morocco	-2,00	33,00	.0324413	5.74	16,9	17,1	0,2	17,0	0,1	17,1	0,0	16,9	0,2	17,0	17,9	0,9
478	Morocco	-2,00	32,00	.0241297	3.86	20,8	21,1	0,3	20,9	0,2	21,0	0,1	20,9	0,2	20,9	21,7	0,8
479	Syria			.0332894	4.73	18,2	18,2	0,0	18,1	0,1	18,2	0,0	18,2	0,0	18,1	18,7	0,6
480	Syria	35,00	32,00	.0399032	6.27	20,5	20,5	0,0	20,4	0,2	20,4	0,1	20,4	0,1	20,4	21,3	0,9
481	Syria	35,25	34,00	.0301738	5.04	20,5	20,1	-0,4	20,1	0,0	20,2	-0,1	20,1	0,1	20,1	20,7	0,6
482	Syria	35,25	33,00	.0151165	2.11	19,9	19,5	-0,4	19,8	-0,3	19,8	-0,4	19,7	-0,2	19,8	19,9	0,1
483	Syria	36,00	34,00	.0535963	8.23	9,5	9,6	0,1	9,2	0,4	9,3	0,3	9,3	0,2	9,2	10,2	1,0
484	Syria	36,00	33,00	.030782	4.82	20,3	20,1	-0,2	20,3	-0,1	20,3	-0,2	20,2	-0,1	20,3	20,6	0,4
485	Syria	36,00	32,00	.0324261	5.38	17,2	17,0	-0,2	17,2	-0,2	17,3	-0,2	17,2	-0,1	17,2	17,6	0,4
486	Syria	36,25	36,00	.0182059	2.77	13,5	13,5	0,0	13,4	0,1	13,6	-0,1	13,7	-0,2	13,4	13,8	0,4
487	Syria	36,25	35,00	.0267425	4.16	17,8	17,7	-0,1	17,6	0,1	17,8	0,0	17,8	-0,1	17,6	18,2	0,6
488	Syria	37,00	36,00	.0252088	3.49	17,6	17,6	0,0	17,5	0,1	17,7	-0,1	17,7	-0,1	17,5	18,1	0,5
489	Syria	37,00	35,00	.0368567	4.95	16,7	16,6	-0,1	16,6	0,1	16,7	-0,1	16,7	-0,1	16,6	17,2	0,7
490	Syria	37,00	34,00	.0442289	6.40	16,0	15,9	-0,1	16,0	-0,1	16,3	-0,4	16,2	-0,3	16,0	16,6	0,6
491	Syria	37,00	33,00	.0327516	5.18	13,1	12,8	-0,3	13,1	-0,3	13,2	-0,4	13,1	-0,2	13,1	13,4	0,3
492	Syria	37,00	32,00	.0280693	4.51	19,8	19,6	-0,2	19,8	-0,2	19,8	-0,3	19,7	-0,2	19,8	20,0	0,2
493	Syria	38,00	36,00	.0301601	3.99	18,3	18,3	0,0	18,2	0,2	18,3	0,0	18,3	0,0	18,2	18,8	0,7
494	Syria	38,00	35,00	.0348388	4.76	16,8	16,8	0,0	16,7	0,1	16,8	0,0	16,8	0,0	16,7	17,4	0,7
495	Syria	38,00	34,00	.0370819	5.31	16,4	16,3	-0,1	16,3	0,0	16,5	-0,1	16,4	-0,1	16,3	16,9	0,6
496	Syria	38,00	33,00	.0355737	5.05	19,2	19,1	-0,1	19,2	-0,1	19,3	-0,2	19,2	0,0	19,2	19,7	0,5
497	Syria	38,00	32,00	.0270197	3.90	18,5	18,4	-0,1	18,5	-0,2	18,6	-0,3	18,5	-0,1	18,5	18,7	0,2
498	Syria	39,00	36,00	.0259702	3.27	18,4	18,6	0,2	18,3	0,2	18,5	0,1	18,5	0,1	18,3	18,9	0,6
499	Syria	39,00	35,00	.0333561	4.56	18,1	18,2	0,1	18,0	0,1	18,1	0,0	18,1	0,1	18,0	18,7	0,6
500	Syria	39,00	34,00	.0309534	4.06	17,8	17,9	0,1	17,8	0,1	17,9	0,0	17,8	0,1	17,8	18,3	0,6
501	Syria	39,00	33,00	.0282607	2.79	18,7	18,8	0,1	18,7	0,1	18,8	0,0	18,7	0,1	18,7	19,2	0,5
502	Syria	40,00	37,00	.0259811	2.88	17,8	17,9	0,1	17,7	0,2	17,8	0,1	17,9	0,0	17,7	18,3	0,6
503	Syria	40,00	36,00	.0341422	4.19	19,4	19,5	0,1	19,3	0,2	19,4	0,1	19,3	0,1	19,3	19,9	0,6
504	Syria	40,00	35,00	.0377102	4.80	19,8	19,8	0,0	19,7	0,1	19,8	0,0	19,7	0,1	19,7	20,3	0,6
505	Syria	40,00	34,00	.0318334	4.02	18,9	19,0	0,1	18,9	0,1	19,0	0,0	19,1	-0,1	18,9	19,5	0,6
506	Syria	40,00	33,00	.0290349	3.33	18,8	18,8	0,0	18,8	0,0	19,0	-0,2	19,1	-0,3	18,8	19,3	0,5
507	Syria	41,00	37,00	.0433362	4.20	19,0	19,2	0,2	18,9	0,3	18,9	0,2	18,9	0,3	18,9	19,8	0,9
508	Syria	41,00	36,00	.0422329	4.93	19,8	19,9	0,1	19,7	0,2	19,8	0,1	19,7	0,2	19,7	20,5	0,8
509	Syria	41,00	35,00	.0419384	4.90	21,1	21,1	0,0	21,0	0,1	21,1	0,1	20,9	0,2	21,0	21,7	0,7
510	Syria	41,00	34,00	.035168	4.01	19,8	19,9	0,1	19,8	0,1	19,9	-0,1	20,0	-0,1	19,8	20,4	0,6
511	Syria	42,00	37,00	.0346409	3.63	20,3	20,5	0,2	20,1	0,3	20,2	0,3	20,2	0,3	20,1	21,1	0,9
512	Syria	42,00	36,00	.0452548	4.40	20,5	20,7	0,2	20,4	0,3	20,5	0,2	20,5	0,2	20,4	21,5	1,1
513	Tunisia			.0563076	9.92	20,0	20,4	0,4	20,0	0,4	20,0	0,4	19,8	0,5	20,0	21,2	1,2
514	Tunisia	7,00	34,00	.051758	7.35	21,6	21,8	0,2	21,7	0,1	21,5	0,3	21,3	0,5	21,7	22,5	0,8
515	Tunisia	7,00	33,00	.0500091	7.80	21,6	21,9	0,3	21,6	0,2	21,5	0,3	21,3	0,5	21,6	22,6	1,0
516	Tunisia	8,00	37,00	.0382673	5.67	17,5	17,8	0,3	17,7	0,1	17,5	0,3	17,4	0,3	17,7	18,1	0,5
517	Tunisia	8,00	36,00	.0632637	9.05	15,8	16,1	0,3	15,9	0,2	15,7	0,3	15,6	0,5	15,9	17,1	1,2
518	Tunisia	8,00	35,00	.0552668	8.17	15,9	16,1	0,2	15,9	0,2	15,8	0,4	15,6	0,5	15,9	17,1	1,1
519	Tunisia	8,00	34,00	.0467128	7.18	21,5	21,8	0,3	21,5	0,3	21,4	0,5	21,2	0,6	21,5	22,6	1,0
520	Tunisia	8,00	33,00	.0521985	8.19	21,3	21,6	0,3	21,2	0,3	21,2	0,4	21,0	0,6	21,2	22,4	1,1
521	Tunisia	8,00	32,00	.0510012	8.26	23,6	23,9	0,3	23,6	0,3	23,6	0,4	23,4	0,5	23,6	24,7	1,1
522	Tunisia	9,00	37,00	.0521273	7.31	17,8	18,3	0,5	18,0	0,3	17,8	0,5	17,7	0,6	18,0	19,0	1,0
523	Tunisia	9,00	36,00	.0395941	6.19	16,0	16,0	0,0	16,1	-0,1	15,9	0,1	15,8	0,2	16,1	16,7	0,6
524	Tunisia	9,00	35,00	.0587017	9.08	18,1	18,4	0,3	18,1	0,2	18,0	0,4	17,7	0,6	18,1	19,3	1,1
525	Tunisia	9,00	34,00	.0664633	9.83	21,1	21,6	0,5	21,1	0,5	20,9	0,7	20,8	0,8	21,1	22,7	1,6
526	Tunisia	9,00	33,00	.0622041	9.93	21,6	22,0	0,4	21,6	0,5	21,5	0,5	21,4	0,6	21,6	23,0	1,4
527	Tunisia	9,00	32,00	.0535142	7.55	24,1	24,3	0,2	24,0	0,3	24,0	0,3	23,9	0,4	24,0	25,1	1,1
528	Tunisia	9,00	31,00	.0588522	9.12	22,8	23,2	0,4	22,7	0,6	22,8	0,5	22,6	0,6	22,7	24,0	1,3
529	Tunisia	9,00	30,00	.0562744	9.27	22,5	23,1	0,6	22,5	0,7	22,6	0,6	22,5	0,7	22,5	23,8	1,3
530	Tunisia	10,00	37,00	.062505	10.27	18,0	18,7	0,7	18,3	0,4	18,1	0,6	18,2	0,5	18,3	19,7	1,4
531	Tunisia	10,00	36,00	.062598	10.07	16,9	17,6	0,7	17,0	0,5	16,8	0,7	16,7	0,8	17,0	18,6	1,5
532	Tunisia	10,00	35,00	.0378242	5.19	20,2	20,5	0,3	20,3	0,2	20,1	0,4	20,0	0,5	20,3	21,0	0,8
533	Tunisia	10,00	34,00	.0541744	10.13	19,7	20,2	0,5	19,6	0,6	19,6	0,7	19,5	0,7	19,6	21,0	1,4
534	Tunisia	10,00	33,00	.0769596	11.91	20,6	21,0	0,4	20,5	0,5	20,5	0,5	20,4	0,6	20,5	22,1	1,6
535	Tunisia	10,00	32,00	.0721396	9.79	22,8	23,1	0,3	22,7	0,4	22,8	0,4	22,7	0,5	22,7	24,1	1,4
536	Tunisia	10,00	31,00	.0636932	9.12	21,9	22,4	0,5	21,8	0,7	21,9	0,5	21,7	0,7	21,8	23,2	1,4
537	Tunisia	10,00	30,00	.0563446	8.57	21,3	21,9	0,6	21,2	0,7	21,3	0,6	21,2	0,7	21,2	22,5	1,3
538	Tunisia	11,00	37,00	.0528696	9.16	17,4	17,6	0,2	17,6	0,0	17,4	0,2	17,5	0,1	17,6	18,5	0,9
539	Tunisia	11,00	36,00	.0328346	6.62	19,6	19,5	-0,1	19,7	-0,2	19,5	0,0	19,4	0,1	19,7	20,0	0,4
540	Tunisia	11,00	35,00	.0563957	9.96	18,9	19,3	0,4	18,9	0,4	18,8	0,5	18,6	0,6	18,9	20,1	1,2
541	Tunisia	11,00	34,00	.0461666	8.34	20,0	20,3	0,3	19,9	0,4	19,9	0,4	19,8	0,5	19,9	21,1	1,2
542	Tunisia	11,00	33,00	.0801054	12.37	20,9	21,4	0,5	20,8	0,6	20,8	0,6	20,7	0,7	20,8	22,6	1,7
543	Tunisia	11,00	32,00	.0784103	10.30	19,6	20,3	0,7	19,6	0,8	19,7	0,7	19,7	0,6	19,6	21,3	1,7
544	Turkey			.0232727	0.87	12,1	12,5	0,4	12,1	0,4	12,0	0,4	11,9	0,5	12,1	12,5	0,4
545	Turkey	25,00	40,00	.0300123	1.07	15,3	15,3	0,0	15,0	0,3	14,8	0,5	14,9	0,4	15,0	15,4	0,4
546	Turkey	26,00	41,00	.0513358	1.76	11,0	11,1	0,1	10,8	0,3	10,7	0,4	10,6	0,4	10,8	11,3	0,5
547	Turkey	27,00	42,00	.056924	1.78	12,9	13,3	0,4	12,9	0,4	12,9	0,5	12,8	0,6	12,9	13,6	0,6
548	Turkey	27,00	41,00	.0587377	1.99	13,7	14,0	0,3	13,6	0,4	13,6	0,4	13,5	0,5	13,6	14,2	0,6
549	Turkey	27,00	40,00	.0732353	2.19	13,7	14,0	0,3	13,6	0,4	13,6	0,4	13,5	0,5	13,6	14,3	0,6
550	Turkey	27,00	39,00	.0510906	2.03	16,3	16,6	0,3	16,3	0,3	16,3	0,3	16,3	0,3	16,3	16,8	0,5
551	Turkey	27,00	38,00	.0709804	2.79	17,0	17,5	0,5	16,9	0,6	16,8	0,7	16,8	0,7	16,9	17,8	0,9
552	Turkey	28,00	41,00	.079951	2.37	12,8	13,5	0,7	12,8	0,7	12,8	0,7	12,7	0,8	12,8	13,8	1,0
553	Turkey	28,00	40,00	.0291912	1.03	13,2	13,3	0,1	13,2	0,1	13,1	0,2	13,0	0,2	13,2	13,3	0,2
554	Turkey	28,00	39,00	.0281128	0.94	16,4	17,0	0,6	16,5	0,5	16,4	0,5	16,5	0,4	16,5	17,0	0,6
555	Turkey	28,00	38,00	.020478	0.85	18,9	19,2	0,3	18,9	0,3	18,9	0,3	19,0	0,2	18,9	19,2	0,3
556	Turkey	28,00	37,00	-.0860294	-3.68	18,1	17,8	-0,3	18,1	-0,3	18,0	-0,3	18,2	-0,4	18,1	17,4	-0,7
557	Turkey	29,00	41,00	.0630147	1.85	13,3	14,3	1,0	13,4	0,8	13,4	0,9	13,4	0,9	13,4	14,5	1,1
558	Turkey	29,00	40,00	.0185539	0.59	12,3	12,6	0,3	12,4	0,3	12,3	0,3	12,2	0,5	12,4	12,6	0,3
559	Turkey	29,00	39,00	.0190196	0.64	13,7	14,2	0,5	13,7	0,5	13,7	0,5	13,7	0,5	13,7	14,2	0,5
560	Turkey	29,00	38,00	.0367157	1.28	14,3	14,7	0,4	14,2	0,6	14,2	0,5	14,2	0,5	14,2	14,8	0,6

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
561	Turkey	29,00	37,00	-.0194363	-0.82	18,5	18,7	0,2	18,6	0,1	18,5	0,2	18,6	0,1	18,6	18,6	0,1
562	Turkey	30,00	41,00	-.0283456	-0.79	13,5	13,4	-0,1	13,5	-0,1	13,5	-0,1	13,4	0,0	13,5	13,2	-0,3
563	Turkey	30,00	40,00	-.0128064	-0.36	9,1	9,2	0,1	9,1	0,1	9,1	0,1	9,0	0,2	9,1	9,1	0,0
564	Turkey	30,00	39,00	.0037623	0.13	12,3	12,8	0,5	12,3	0,5	12,3	0,5	12,4	0,4	12,3	12,8	0,4
565	Turkey	30,00	38,00	.0045221	0.16	13,6	14,0	0,4	13,6	0,5	13,5	0,5	13,6	0,4	13,6	14,0	0,4
566	Turkey	30,00	37,00	.0491422	2.02	13,0	13,3	0,3	12,9	0,4	12,9	0,5	12,9	0,4	12,9	13,5	0,5
567	Turkey	30,00	36,00	.0784191	3.28	16,8	17,2	0,4	16,6	0,6	16,6	0,6	16,6	0,6	16,6	17,5	0,8
568	Turkey	31,00	41,00	.0545343	1.45	13,6	14,1	0,5	13,7	0,4	13,6	0,5	13,4	0,7	13,7	14,2	0,6
569	Turkey	31,00	40,00	.0285784	0.79	10,3	10,6	0,3	10,4	0,2	10,3	0,3	10,2	0,4	10,4	10,6	0,3
570	Turkey	31,00	39,00	-.0422671	-1.13	11,4	11,9	0,5	11,5	0,4	11,4	0,4	11,3	0,5	11,5	11,7	0,3
571	Turkey	31,00	38,00	.0193628	0.69	5,5	6,0	0,5	5,4	0,6	5,2	0,8	5,3	0,7	5,4	6,0	0,7
572	Turkey	31,00	37,00	.0265196	0.95	16,6	17,0	0,4	16,4	0,6	16,3	0,7	16,3	0,7	16,4	17,1	0,6
573	Turkey	32,00	41,00	.0477328	1.52	10,3	10,7	0,4	10,3	0,4	10,3	0,4	10,2	0,5	10,3	10,8	0,5
574	Turkey	32,00	40,00	.0522181	1.55	12,9	13,4	0,5	12,9	0,5	12,8	0,6	12,6	0,8	12,9	13,5	0,6
575	Turkey	32,00	39,00	.0081373	0.24	11,7	12,1	0,4	11,7	0,4	11,6	0,5	11,5	0,6	11,7	12,1	0,4
576	Turkey	32,00	38,00	-.0038971	-0.12	10,6	10,8	0,2	10,5	0,3	10,3	0,5	10,1	0,7	10,5	10,7	0,3
577	Turkey	32,00	37,00	-.2356373	-4.25	20,7	19,6	-1,1	20,6	-1,0	20,6	-1,0	20,5	-1,0	20,6	18,6	-2,0
578	Turkey	33,00	42,00	.0438235	1.56	7,8	8,0	0,2	7,7	0,3	7,6	0,3	7,4	0,6	7,7	8,1	0,4
579	Turkey	33,00	41,00	.0538848	1.69	7,6	8,1	0,5	7,5	0,5	7,4	0,6	7,3	0,7	7,5	8,2	0,7
580	Turkey	33,00	40,00	.0843628	2.47	11,0	11,8	0,8	10,9	0,9	10,8	1,0	10,7	1,1	10,9	12,0	1,2
581	Turkey	33,00	39,00	.0584804	1.68	9,7	10,2	0,5	9,7	0,5	9,7	0,6	9,5	0,7	9,7	10,3	0,6
582	Turkey	33,00	38,00	.0450368	1.22	11,4	11,7	0,3	11,4	0,3	11,4	0,3	11,1	0,6	11,4	11,8	0,4
583	Turkey	33,00	37,00	-.1573162	-4.01	13,1	12,6	-0,5	13,0	-0,5	13,0	-0,4	12,9	-0,4	13,0	11,9	-1,1
584	Turkey	33,00	36,00	-.1950735	-4.34	12,6	11,9	-0,7	12,5	-0,6	12,5	-0,6	12,6	-0,7	12,5	11,1	-1,4
585	Turkey	34,00	42,00	.0401471	1.45	7,7	7,8	0,1	7,6	0,2	7,4	0,4	7,1	0,7	7,6	7,9	0,3
586	Turkey	34,00	41,00	.0410417	1.31	8,5	8,8	0,3	8,3	0,5	8,2	0,5	8,1	0,6	8,3	8,8	0,6
587	Turkey	34,00	40,00	.0310049	0.71	10,5	10,7	0,2	10,4	0,3	10,3	0,4	10,1	0,5	10,4	10,7	0,3
588	Turkey	34,00	39,00	.0370833	1.07	10,1	10,5	0,4	10,0	0,5	9,9	0,6	9,8	0,7	10,0	10,6	0,5
589	Turkey	34,00	38,00	.0972549	3.29	6,2	6,9	0,7	6,2	0,8	6,2	0,7	6,0	0,9	6,2	7,2	1,0
590	Turkey	34,00	37,00	.015674	0.69	10,2	10,8	0,6	10,2	0,6	10,2	0,6	10,1	0,7	10,2	10,8	0,6
591	Turkey	34,00	36,00	.0027941	0.12	17,6	18,1	0,5	17,5	0,6	17,5	0,6	17,4	0,7	17,5	18,0	0,5
592	Turkey	35,00	42,00	.0430882	1.42	9,7	9,9	0,2	9,5	0,3	9,4	0,5	9,2	0,7	9,5	10,0	0,5
593	Turkey	35,00	41,00	.039951	1.12	11,8	12,0	0,2	11,7	0,3	11,5	0,5	11,2	0,7	11,7	12,0	0,4
594	Turkey	35,00	40,00	.0539828	1.59	9,8	10,3	0,5	9,7	0,6	9,6	0,7	9,5	0,8	9,7	10,4	0,7
595	Turkey	35,00	39,00	.0259559	0.70	12,1	12,5	0,4	12,0	0,5	11,9	0,6	11,6	0,9	12,0	12,5	0,5
596	Turkey	35,00	38,00	.0362745	1.18	8,5	9,0	0,5	8,4	0,6	8,3	0,7	8,2	0,8	8,4	9,0	0,7
597	Turkey	35,00	37,00	.0354167	1.51	12,2	12,8	0,6	12,2	0,6	12,2	0,6	12,2	0,6	12,2	12,8	0,7
598	Turkey	36,00	41,00	.0337255	0.90	14,4	14,3	-0,1	14,1	0,2	14,0	0,3	13,8	0,6	14,1	14,4	0,3
599	Turkey	36,00	40,00	.0309314	0.85	9,9	10,2	0,3	9,8	0,4	9,7	0,5	9,5	0,8	9,8	10,3	0,5
600	Turkey	36,00	39,00	.0406005	0.97	6,9	7,3	0,4	6,7	0,6	6,6	0,7	6,5	0,8	6,7	7,4	0,7
601	Turkey	36,00	38,00	.0182843	0.68	12,0	12,3	0,3	11,9	0,3	11,9	0,4	11,8	0,5	11,9	12,3	0,3
602	Turkey	36,00	37,00	-.0001961	-0.01	19,1	19,2	0,1	19,1	0,1	19,0	0,2	18,9	0,3	19,1	19,1	0,1
603	Turkey	37,00	41,00	-.002598	-0.08	11,7	11,8	0,1	11,6	0,2	11,5	0,3	11,3	0,5	11,6	11,7	0,1
604	Turkey	37,00	40,00	.0154779	0.37	9,1	9,8	0,7	9,2	0,6	9,1	0,7	8,9	0,9	9,2	9,8	0,6
605	Turkey	37,00	39,00	.0324632	0.97	3,1	3,6	0,5	3,1	0,5	3,0	0,5	2,7	0,9	3,1	3,7	0,6
606	Turkey	37,00	38,00	.0420834	1.48	14,3	14,7	0,4	14,3	0,4	14,3	0,5	14,2	0,5	14,3	14,8	0,5
607	Turkey	37,00	37,00	.0214951	0.91	16,2	16,6	0,4	16,3	0,3	16,3	0,3	16,3	0,3	16,3	16,7	0,3
608	Turkey	37,00	36,00	.0215931	0.91	17,5	18,0	0,5	17,4	0,6	17,4	0,6	17,3	0,7	17,4	18,1	0,7
609	Turkey	38,00	41,00	.0190564	0.62	11,6	11,7	0,1	11,5	0,2	11,5	0,2	11,3	0,4	11,5	11,7	0,3
610	Turkey	38,00	40,00	.0074387	0.21	9,0	9,5	0,5	9,0	0,5	9,0	0,5	8,7	0,8	9,0	9,5	0,5
611	Turkey	38,00	39,00	.0273039	0.86	8,5	8,8	0,3	8,4	0,4	8,4	0,4	8,3	0,5	8,4	8,8	0,4
612	Turkey	38,00	38,00	.0355269	1.30	14,9	15,5	0,6	14,9	0,6	14,9	0,6	15,0	0,6	14,9	15,6	0,7
613	Turkey	38,00	37,00	.0202941	0.81	17,2	18,0	0,8	17,2	0,8	17,3	0,7	17,3	0,7	17,2	18,0	0,8
614	Turkey	38,00	36,00	.0239951	0.99	18,2	18,8	0,6	18,1	0,7	18,1	0,7	18,1	0,7	18,1	18,8	0,8
615	Turkey	39,00	41,00	.0022181	0.07	12,2	12,2	0,0	12,0	0,1	12,0	0,2	11,7	0,5	12,0	12,1	0,1
616	Turkey	39,00	40,00	-.0218382	-0.61	6,8	7,1	0,3	6,6	0,5	6,6	0,5	6,4	0,7	6,6	7,0	0,4
617	Turkey	39,00	39,00	.0195833	0.60	13,9	14,2	0,3	13,8	0,4	13,8	0,4	13,5	0,6	13,8	14,1	0,4
618	Turkey	39,00	38,00	.030674	1.12	17,0	17,4	0,4	16,9	0,5	16,9	0,5	16,9	0,5	16,9	17,4	0,5
619	Turkey	39,00	37,00	-.001777	-0.06	17,7	18,3	0,6	17,7	0,6	17,7	0,6	17,7	0,6	17,7	18,3	0,6
620	Turkey	39,00	36,00	.0065931	0.26	18,4	18,9	0,5	18,3	0,6	18,4	0,6	18,4	0,6	18,3	18,9	0,6
621	Turkey	40,00	41,00	-.0214951	-0.69	7,8	7,6	-0,2	7,5	0,1	7,4	0,2	7,1	0,4	7,5	7,4	0,0
622	Turkey	40,00	40,00	-.0422794	-1.08	2,7	2,9	0,2	2,4	0,6	2,4	0,6	2,3	0,7	2,4	2,7	0,4
623	Turkey	40,00	39,00	-.0187745	-0.55	12,0	12,1	0,1	11,9	0,2	11,9	0,2	11,8	0,3	11,9	12,0	0,1
624	Turkey	40,00	38,00	.0296937	1.08	12,5	12,7	0,2	12,5	0,2	12,5	0,3	12,3	0,5	12,5	12,8	0,3
625	Turkey	40,00	37,00	.0088235	0.29	17,7	18,3	0,6	17,6	0,7	17,6	0,7	17,5	0,8	17,6	18,3	0,7
626	Turkey	40,00	36,00	.0046201	0.17	19,3	19,9	0,6	19,1	0,8	19,2	0,7	19,2	0,7	19,1	19,9	0,8
627	Turkey	41,00	41,00	.0016054	0.05	2,8	2,5	-0,3	2,6	-0,1	2,5	0,0	2,2	0,3	2,6	2,4	-0,2
628	Turkey	41,00	40,00	-.0092034	-0.24	4,9	4,9	0,0	4,7	0,2	4,6	0,2	4,3	0,5	4,7	4,7	0,1
629	Turkey	41,00	39,00	-.0819118	-1.87	9,3	9,2	-0,1	9,2	0,0	9,3	-0,1	9,2	0,0	9,2	8,9	-0,3
630	Turkey	41,00	38,00	.0412745	1.36	16,2	16,5	0,3	16,1	0,5	16,2	0,4	16,0	0,5	16,1	16,7	0,6
631	Turkey	41,00	37,00	.0275245	0.67	18,9	19,8	0,9	18,7	1,1	18,8	1,0	18,8	1,0	18,7	19,8	1,0
632	Turkey	42,00	41,00	.0327696	0.97	10,4	10,4	0,0	10,1	0,3	10,1	0,3	9,8	0,6	10,1	10,4	0,3
633	Turkey	42,00	40,00	-.0270098	-0.62	3,5	3,2	-0,3	3,3	-0,2	3,3	-0,2	3,0	0,2	3,3	3,0	-0,3
634	Turkey	42,00	39,00	.0212377	0.67	9,9	10,2	0,3	9,8	0,4	9,9	0,3	9,8	0,4	9,8	10,2	0,4
635	Turkey	42,00	38,00	.0984804	3.34	17,6	18,3	0,7	17,6	0,7	17,7	0,6	17,6	0,7	17,6	18,6	1,0
636	Turkey	42,00	37,00	.0846079	2.49	20,2	20,9	0,7	20,1	0,7	20,2	0,7	20,2	0,6	20,1	21,1	0,9
637	Turkey	43,00	41,00	.0312745	0.73	2,0	2,3	0,3	1,8	0,5	1,9	0,4	1,7	0,6	1,8	2,3	0,5
638	Turkey	43,00	40,00	.0251348	0.64	5,9	6,2	0,3	5,8	0,4	6,0	0,2	5,9	0,3	5,8	6,1	0,4
639	Turkey	43,00	39,00	.0303799	1.07	10,1	10,8	0,7	10,1	0,7	10,1	0,7	9,9	0,9	10,1	10,8	0,8
640	Turkey	43,00	38,00	.0533946	1.64	11,0	11,6	0,6	11,0	0,6	11,1	0,5	11,1	0,5	11,0	11,7	0,7
641	Turkey	43,00	37,00	.1190932	3.41	19,4	20,0	0,6	19,4	0,6	19,4	0,6	19,4	0,6	19,4	20,3	0,9
642	Turkey	44,00	40,00	.0384069	1.01	3,6	4,3	0,7	3,7	0,6	3,8	0,5	3,8	0,4	3,7	4,3	0,6
643	Turkey	44,00	39,00	.0286274	0.92	4,3	5,1	0,8	4,3	0,9	4,4	0,7	4,3	0,8	4,3	5,2	1,0
644	Turkey	44,00	38,00	.0835662	1.72	3,5	4,0	0,5	3,4	0,6	3,6	0,4	3,6	0,4	3,4	4,3	0,8
645	Turkey	44,00	37,00	.1356005	3.84	15,8	16,5	0,7	15,9	0,6	15,9	0,6	15,9	0,6	15,9	16,9	1,0
646	Turkey	44,00	36,00	.1907108	3.69	15,9	16,8	0,9	16,0	0,7	16,0	0,8	16,0	0,8	16,0	17,3	1,2
647	Libye			.0387903	7.58	22,3	23,0	0,7	22,2	0,8	22,2	0,8	22,2	0,7	22,2	23,3	1,2
648	Libye	9,00	30,00	.0492574	5.78	22,5	23,3	0,8	22,4	0,9	22,4	0,9	22,3	1,0	22,4	23,8	1,4
649	Libye	9,00	29,00	.0441297	6.24	21,7	22,4	0,7	21,6	0,8	21,6	0,7	21,5	0,9	21,6	22,8	1,3
650	Libye	9,00	28,00	.0331586	4.78	22,3	22,8	0,6	22,2	0,6	22,3	0,6	22,2	0,6	22,2	23,3	1,1
651	Libye	9,00	27,00	.0187097	2.16	24,8	25,3	0,5	24,8	0,5	25,0	0,4	24,9	0,4	24,8	25,7	0,9
652	Libye	9,00	26,00	.0083837	1.00	23,4	23,8	0,4	23,4	0,4	23,6	0,2	23,6	0,2	23,4	24,1	0,7
653	Libye	9,00	25,00	-.0024664	-0.29	23,0	23,3	0,4	23,0	0,3	23,2	0,1	23,3	0,0	23,0	23,5	0,5
654	Libye	10,00	32,00	.0633938	6.62	22,7	23,4	0,7	22,6	0,9	22,5	1,0	22,1	1,3	22,6	24,1	1,6
655	Libye	10,00	31,00	.0537702	5.90	21,8	22,7	0,9	21,7	1,0	21,7	1,0	21,4	1,2	21,7	23,2	1,5
656	Libye	10,00	30,00	.0465188	5.19	21,2	22,1	0,9	21,2	1,0	21,2	1,0	21,0	1,1	21,2	22,5	1,3
657	Libye	10,00	29,00	.0423354	6.37	20,7	21,3	0,7	20,6	0,8	20,6	0,7	20,5	0,9	20,6	21,8	1,2
658	Libye	10,00	28,00	.0348454	5.38	21,9	22,4	0,6	21,8	0,6	21,9	0,6	21,8	0,7	21,8	22,9	1,1
659	Libye	10,00	27,00	.0206989	2.87	24,0	24,5	0,5	23,9	0,5	24,0	0,4	24,0	0,4	23,9	24,8	0,9
660	Libye	10,00	26,00	.0090625	1.18	24,2	24,7	0,5	24,2	0,4	24,4	0,3	24,4	0,2	24,2	24,9	0,7
661	Libye	10,00	25,00	.0003024	0.04	21,3	21,7	0,4	21,4	0,4	21,6	0,2	21,7	0,1	21,4	21,9	0,5
662	Libye	10,00	24,00	-.0234913	-2.21	24,6	24,8	0,2	24,7	0,1	24,9	-0,1	25,0	-0,2	24,7	24,7	0,0
663	Libye	11,00	33,00	.0729234	8.62	20,9	21,8	0,9	20,6	1,1	20,6	1,2	20,3	1,5	20,6	22,6	1,9
664	Libye	11,00	32,00	.0672648	7.34	19,6	20,6	1,1	19,5	1,2	19,5	1,2	19,2	1,5	19,5	21,3	1,8
665	Libye	11,00	31,00	.0568112	6.71	19,8	20,7	0,9	19,6	1,1	19,6	1,1	19,4	1,3	19,6	21,2	1,6
666	Libye	11,00	30,00	.0488508	6.28	20,0	20,8	0,8	19,9	0,9	19,8	1,0	19,7	1,1	19,9	21,2	1,4
667	Libye	11,00	29,00	.0425873	6.62	20,8	21,5	0,7	20,8	0,8	20,8	0,8	20,7	0,9	20,8	22,0	1,2
668	Libye	11,00	28,00	.0355309	5.89	22,7	23,3	0,6	22,6	0,7	22,6	0,6	22,6	0,7	22,6	23,7	1,1
669	Libye	11,00	27,00	.0241532	3.77	23,5	24,0	0,5	23,5	0,6	23,5	0,5	23,5	0,5	23,5	24,4	0,9
670	Libye	11,00	26,00	.0128562	1.84	24,4	24,9	0,5	24,4	0,5	24,5	0,3	24,6	0,3	24,4	25,1	0,7
671	Libye	11,00	25,00	.0001042	0.01	24,4	24,8	0,4	24,4	0,3	24,6	0,2	24,7	0,1	24,4	24,9	0,5
672	Libye	11,00	24,00	-.0099899	-1.12	23,6	23,9	0,3	23,7	0,2	23,9	0,0	23,9	-0,1	23,7	24,0	0,3
673	Libye	11,00	23,00	-.0062231	-0.74	25,2	25,5	0,3	25,3	0,2	25,4	0,1	25,5	0,0	25,3	25,6	0,3
674	Libye	12,00	32,00	.0533199	6.97	18,5	19,4	0,9	18,4	1,1	18,4	1,1	18,3	1,1	18,4	19,9	1,6
675	Libye	12,00	31,00	.0509577	6.72	18,9	19,9	0,9	18,8	1,0	18,8	1,0	18,7	1,1	18,8	20,3	1,5
676	Libye	12,00	30,00	.0458972	6.74	19,4	20,4	0,9	19,4	1,0	19,3	1,0	19,3	1,1	19,4	20,8	1,4
677	Libye	12,00	29,00	.0434173	7.71	20,0	20,8	0,8	19,9	0,9	19,9	0,9	19,9	0,9	19,9	21,2	1,3
678	Libye	12,00	28,00	.0393145	7.16	22,4	23,1	0,7	22,3	0,8	22,3	0,8	22,3	0,8	22,3	23,5	1,2
679	Libye	12,00	27,00	.0323656	5.46	22,8	23,4	0,7	22,7	0,7	22,8	0,7	22,8	0,6	22,7	23,8	1,1
680	Libye	12,00	26,00	.0216801	3.38	21,7	22,3	0,6	21,7	0,6	21,8	0,5	21,9	0,4	21,7	22,6	0,9

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
681	Libye	12,00	25,00	.0103159	1.48	22,2	22,7	0,5	22,3	0,4	22,4	0,3	22,4	0,2	22,3	22,9	0,7
682	Libye	12,00	24,00	.0021203	0.27	22,4	22,8	0,4	22,4	0,3	22,5	0,2	22,6	0,1	22,4	22,9	0,5
683	Libye	12,00	23,00	.0017675	0.23	22,6	22,9	0,3	22,6	0,3	22,7	0,2	22,8	0,1	22,6	23,1	0,4
684	Libye	13,00	32,00	.0449597	6.13	18,9	19,6	0,7	18,8	0,8	18,8	0,8	18,7	0,8	18,8	20,0	1,2
685	Libye	13,00	31,00	.0426815	5.90	18,3	19,2	0,9	18,3	1,0	18,3	0,9	18,3	0,9	18,3	19,6	1,3
686	Libye	13,00	30,00	.0415087	6.51	19,3	20,3	1,0	19,3	1,1	19,3	1,1	19,3	1,0	19,3	20,7	1,4
687	Libye	13,00	29,00	.0444288	8.34	20,0	20,9	0,9	19,9	1,0	19,9	1,0	20,0	1,0	19,9	21,3	1,5
688	Libye	13,00	28,00	.0449731	8.00	22,3	23,1	0,9	22,2	1,0	22,2	1,0	22,3	0,9	22,2	23,6	1,4
689	Libye	13,00	27,00	.0413172	6.78	22,6	23,4	0,8	22,6	0,9	22,6	0,8	22,7	0,7	22,6	23,9	1,3
690	Libye	13,00	26,00	.0325067	5.30	21,8	22,5	0,7	21,8	0,7	21,8	0,7	21,9	0,6	21,8	22,9	1,1
691	Libye	13,00	25,00	.0215289	3.40	22,4	23,0	0,6	22,4	0,6	22,4	0,5	22,5	0,4	22,4	23,3	0,9
692	Libye	13,00	24,00	.0131687	1.92	23,0	23,4	0,4	23,0	0,4	23,1	0,4	23,2	0,3	23,0	23,7	0,7
693	Libye	13,00	23,00	.0091095	1.24	23,5	23,9	0,4	23,5	0,3	23,6	0,3	23,7	0,2	23,5	24,1	0,6
694	Libye	13,00	22,00	.0098622	1.28	25,0	25,2	0,3	24,9	0,3	25,0	0,2	25,1	0,1	24,9	25,5	0,5
695	Libye	14,00	32,00	.0410047	5.61	20,2	20,8	0,6	20,2	0,6	20,1	0,7	20,1	0,6	20,2	21,2	1,0
696	Libye	14,00	31,00	.0381586	4.96	21,2	22,1	0,9	21,2	0,9	21,2	0,9	21,3	0,8	21,2	22,4	1,2
697	Libye	14,00	30,00	.0384678	6.04	19,7	20,7	1,0	19,6	1,1	19,6	1,1	19,8	1,0	19,6	21,0	1,4
698	Libye	14,00	29,00	.0450134	8.56	19,9	20,9	1,0	19,8	1,1	19,8	1,1	19,9	1,0	19,8	21,3	1,5
699	Libye	14,00	28,00	.0500874	8.04	21,8	22,8	0,9	21,7	1,0	21,7	1,0	21,9	0,9	21,7	23,3	1,6
700	Libye	14,00	27,00	.0506821	7.30	21,9	22,8	0,8	21,8	1,0	21,8	1,0	22,0	0,8	21,8	23,4	1,5
701	Libye	14,00	26,00	.0428159	6.62	21,8	22,6	0,8	21,7	0,9	21,7	0,8	21,8	0,7	21,7	23,1	1,4
702	Libye	14,00	25,00	.0318515	5.13	22,8	23,4	0,7	22,7	0,7	22,7	0,7	22,8	0,6	22,7	23,8	1,1
703	Libye	14,00	24,00	.0229671	3.51	23,5	24,1	0,5	23,5	0,6	23,6	0,5	23,7	0,4	23,5	24,4	0,9
704	Libye	14,00	23,00	.0176748	2.50	23,8	24,2	0,4	23,8	0,4	23,9	0,4	24,0	0,3	23,8	24,6	0,7
705	Libye	14,00	22,00	.0157997	2.08	25,9	26,2	0,3	25,8	0,4	25,9	0,3	26,0	0,2	25,8	26,5	0,6
706	Libye	15,00	32,00	.0501915	6.99	20,3	20,8	0,5	20,3	0,5	20,2	0,5	20,2	0,5	20,3	21,3	1,0
707	Libye	15,00	31,00	.0441364	7.48	19,8	20,6	0,8	19,8	0,8	19,7	0,8	19,8	0,8	19,8	21,0	1,2
708	Libye	15,00	30,00	.0415995	7.81	20,1	21,0	1,0	19,9	1,1	19,9	1,1	20,1	0,9	19,9	21,4	1,5
709	Libye	15,00	29,00	.0448622	8.23	20,3	21,3	1,0	20,1	1,2	20,2	1,2	20,3	1,0	20,1	21,8	1,6
710	Libye	15,00	28,00	.051744	8.20	22,0	22,9	0,9	21,8	1,1	21,8	1,1	22,0	0,9	21,8	23,4	1,6
711	Libye	15,00	27,00	.0546069	7.35	22,5	23,4	0,9	22,4	1,0	22,4	1,0	22,5	0,9	22,4	24,0	1,6
712	Libye	15,00	26,00	.0489751	7.09	22,9	23,8	0,8	22,8	1,0	22,8	1,0	22,9	0,8	22,8	24,3	1,5
713	Libye	15,00	25,00	.0400504	6.31	23,3	24,1	0,7	23,2	0,8	23,2	0,8	23,4	0,7	23,2	24,5	1,3
714	Libye	15,00	24,00	.0318716	4.91	23,9	24,5	0,6	23,8	0,7	23,9	0,7	24,0	0,6	23,8	24,9	1,1
715	Libye	15,00	23,00	.0262836	3.78	24,4	24,9	0,5	24,3	0,6	24,3	0,5	24,4	0,4	24,3	25,2	0,9
716	Libye	16,00	31,00	.0550571	8.09	19,7	20,4	0,7	19,6	0,7	19,6	0,7	19,7	0,7	19,6	21,0	1,3
717	Libye	16,00	30,00	.0436526	7.13	20,3	21,2	1,0	20,1	1,1	20,1	1,1	20,2	1,0	20,1	21,7	1,6
718	Libye	16,00	29,00	.0428864	6.71	19,5	20,6	1,1	19,3	1,3	19,3	1,3	19,5	1,1	19,3	21,0	1,7
719	Libye	16,00	28,00	.0492305	8.30	20,7	21,7	1,0	20,5	1,2	20,6	1,1	20,7	1,0	20,5	22,2	1,7
720	Libye	16,00	27,00	.0520363	7.98	22,1	23,0	0,9	21,9	1,1	21,9	1,1	22,1	0,9	21,9	23,5	1,6
721	Libye	16,00	26,00	.0499429	7.49	22,6	23,4	0,9	22,4	1,0	22,4	1,0	22,6	0,9	22,4	24,0	1,6
722	Libye	16,00	25,00	.0450773	6.96	23,2	24,0	0,8	23,0	0,9	23,0	0,9	23,2	0,8	23,0	24,5	1,5
723	Libye	16,00	24,00	.0382426	5.88	23,6	24,3	0,7	23,5	0,8	23,5	0,8	23,7	0,7	23,5	24,8	1,3
724	Libye	16,00	23,00	.0327352	4.69	23,9	24,5	0,5	23,8	0,6	23,8	0,6	23,9	0,5	23,8	24,9	1,1
725	Libye	17,00	31,00	.046334	7.79	19,8	20,4	0,5	19,8	0,6	19,8	0,6	19,8	0,6	19,8	20,9	1,1
726	Libye	17,00	30,00	.0430612	6.97	19,8	20,6	0,8	19,6	1,0	19,6	1,0	19,7	0,9	19,6	21,1	1,5
727	Libye	17,00	29,00	.0430107	6.60	20,3	21,3	1,0	20,1	1,2	20,1	1,2	20,2	1,0	20,1	21,7	1,7
728	Libye	17,00	28,00	.0465793	7.79	19,0	20,0	0,9	18,8	1,2	18,8	1,1	19,0	1,0	18,8	20,4	1,6
729	Libye	17,00	27,00	.049375	7.97	20,4	21,4	0,9	20,3	1,1	20,3	1,1	20,4	0,9	20,3	21,9	1,6
730	Libye	17,00	26,00	.04833	7.45	22,1	23,0	0,9	21,9	1,1	21,9	1,0	22,1	0,9	21,9	23,5	1,6
731	Libye	17,00	25,00	.0456956	6.95	24,6	25,4	0,8	24,4	1,0	24,4	1,0	24,5	0,9	24,4	25,9	1,5
732	Libye	17,00	24,00	.0419422	6.33	24,5	25,3	0,7	24,4	0,9	24,4	0,9	24,5	0,8	24,4	25,7	1,3
733	Libye	17,00	23,00	.0382594	5.53	25,2	25,8	0,6	25,1	0,7	25,0	0,7	25,1	0,7	25,1	26,2	1,2
734	Libye	17,00	22,00	.0343817	4.55	24,2	24,7	0,5	24,1	0,6	24,1	0,6	24,1	0,6	24,1	25,1	1,0
735	Libye	18,00	30,00	.0389785	6.34	19,8	20,5	0,7	19,6	0,8	19,7	0,8	19,8	0,7	19,6	20,9	1,2
736	Libye	18,00	29,00	.0413676	6.71	21,8	22,7	0,8	21,6	1,0	21,7	1,0	21,8	0,8	21,6	23,1	1,4
737	Libye	18,00	28,00	.0439617	7.39	20,1	21,0	0,8	19,9	1,1	19,9	1,0	20,1	0,9	19,9	21,4	1,5
738	Libye	18,00	27,00	.0453831	7.31	19,8	20,6	0,8	19,6	1,0	19,6	1,0	19,7	0,9	19,6	21,1	1,5
739	Libye	18,00	26,00	.0461324	6.96	21,1	21,9	0,8	20,9	1,0	20,9	1,0	21,0	0,9	20,9	22,4	1,5
740	Libye	18,00	25,00	.0458535	6.60	25,0	25,8	0,8	24,8	1,0	24,8	1,0	24,9	0,9	24,8	26,3	1,4
741	Libye	18,00	24,00	.0448589	6.38	25,5	26,2	0,7	25,3	0,9	25,3	0,9	25,4	0,9	25,3	26,7	1,4
742	Libye	18,00	23,00	.0433938	5.97	25,7	26,4	0,7	25,6	0,8	25,6	0,8	25,6	0,8	25,6	26,8	1,2
743	Libye	18,00	22,00	.0410988	5.35	24,2	24,8	0,5	24,1	0,7	24,0	0,7	24,1	0,7	24,1	25,2	1,1
744	Libye	19,00	30,00	.0332728	5.18	20,0	20,6	0,6	19,9	0,7	19,9	0,7	20,0	0,5	19,9	20,9	1,0
745	Libye	19,00	29,00	.037295	6.05	21,3	22,0	0,7	21,1	0,8	21,2	0,8	21,3	0,7	21,1	22,4	1,2
746	Libye	19,00	28,00	.0397312	6.57	21,1	21,8	0,7	20,9	0,9	20,9	0,9	21,0	0,8	20,9	22,2	1,3
747	Libye	19,00	27,00	.0414315	6.42	21,1	21,9	0,8	20,9	0,9	20,9	0,9	21,0	0,8	20,9	22,3	1,4
748	Libye	19,00	26,00	.043629	6.06	21,6	22,4	0,8	21,4	1,0	21,4	1,0	21,5	0,9	21,4	22,8	1,4
749	Libye	19,00	25,00	.0454066	6.03	25,8	26,5	0,8	25,6	0,9	25,6	1,0	25,6	0,9	25,6	26,9	1,4
750	Libye	19,00	24,00	.0466868	6.17	25,6	26,4	0,8	25,5	0,9	25,5	0,9	25,5	0,9	25,5	26,8	1,3
751	Libye	19,00	23,00	.0473018	6.20	24,7	25,4	0,7	24,5	0,8	24,5	0,9	24,5	0,9	24,5	25,8	1,3
752	Libye	19,00	22,00	.0470195	5.92	18,7	19,3	0,6	18,6	0,8	18,5	0,8	18,5	0,8	18,6	19,8	1,2
753	Libye	19,00	21,00	.0437063	5.46	20,7	21,2	0,5	20,5	0,7	20,5	0,7	20,5	0,7	20,5	21,6	1,1
754	Libye	20,00	30,00	.0275974	4.12	21,2	21,7	0,5	21,1	0,6	21,1	0,6	21,3	0,5	21,1	22,0	0,9
755	Libye	20,00	29,00	.0340827	5.49	21,3	21,8	0,6	21,1	0,7	21,1	0,7	21,2	0,6	21,1	22,2	1,0
756	Libye	20,00	28,00	.036875	6.11	21,1	21,7	0,6	20,9	0,8	20,9	0,8	21,0	0,7	20,9	22,0	1,1
757	Libye	20,00	27,00	.0379503	5.57	21,2	21,9	0,7	21,1	0,8	21,1	0,8	21,1	0,8	21,1	22,2	1,2
758	Libye	20,00	26,00	.0400303	5.04	22,2	22,9	0,7	22,1	0,8	22,1	0,9	22,1	0,9	22,1	23,3	1,2
759	Libye	20,00	25,00	.043797	5.39	23,6	24,3	0,7	23,5	0,9	23,4	0,9	23,4	0,9	23,5	24,7	1,3
760	Libye	20,00	24,00	.0482762	5.99	22,8	23,5	0,7	22,6	0,9	22,6	0,9	22,5	1,0	22,6	23,9	1,3
761	Libye	20,00	23,00	.0509946	6.34	23,7	24,5	0,7	23,6	0,9	23,6	0,9	23,5	0,9	23,6	24,9	1,3
762	Libye	20,00	22,00	.0510719	6.25	24,7	25,4	0,7	24,6	0,8	24,5	0,9	24,5	0,9	24,6	25,9	1,3
763	Libye	20,00	21,00	.0491465	6.07	26,1	26,8	0,6	26,0	0,8	25,9	0,8	25,9	0,8	26,0	27,2	1,2
764	Libye	21,00	32,00	.0119825	1.74	18,9	19,2	0,3	18,8	0,4	18,9	0,3	19,0	0,1	18,8	19,3	0,5
765	Libye	21,00	31,00	.0188945	2.72	20,2	20,6	0,4	20,0	0,5	20,1	0,5	20,3	0,3	20,0	20,7	0,7
766	Libye	21,00	30,00	.0274664	4.21	21,6	22,1	0,5	21,5	0,6	21,6	0,6	21,6	0,5	21,5	22,3	0,8
767	Libye	21,00	29,00	.0353394	5.68	21,6	22,2	0,5	21,5	0,6	21,5	0,7	21,5	0,6	21,5	22,5	1,0
768	Libye	21,00	28,00	.0359812	5.94	21,5	22,0	0,6	21,3	0,7	21,3	0,7	21,3	0,7	21,3	22,3	1,0
769	Libye	21,00	27,00	.035914	4.98	21,9	22,5	0,6	21,7	0,7	21,7	0,8	21,7	0,8	21,7	22,8	1,0
770	Libye	21,00	26,00	.0377083	4.24	23,2	23,9	0,6	23,1	0,8	23,0	0,8	23,0	0,9	23,1	24,2	1,1
771	Libye	21,00	25,00	.0446539	5.13	24,2	24,9	0,7	24,1	0,8	24,0	0,9	23,9	0,9	24,1	25,3	1,2
772	Libye	21,00	24,00	.0503797	5.89	24,1	24,8	0,8	23,9	0,9	23,9	0,9	23,8	1,0	23,9	25,2	1,3
773	Libye	21,00	23,00	.0535551	6.24	23,8	24,6	0,8	23,7	0,9	23,6	1,0	23,6	1,0	23,7	25,0	1,3
774	Libye	21,00	22,00	.054748	6.45	24,4	25,1	0,8	24,3	0,9	24,2	0,9	24,2	1,0	24,3	25,6	1,4
775	Libye	21,00	21,00	.0524563	6.59	26,2	26,9	0,7	26,1	0,8	26,0	0,9	26,0	0,9	26,1	27,4	1,3
776	Libye	21,00	20,00	.0483736	6.16	27,2	27,8	0,7	27,0	0,8	27,0	0,8	27,0	0,8	27,0	28,3	1,3
777	Libye	22,00	32,00	.0126579	1.99	19,3	19,6	0,4	19,2	0,4	19,3	0,3	19,4	0,3	19,2	19,7	0,5
778	Libye	22,00	31,00	.0186223	3.05	20,3	20,7	0,4	20,2	0,5	20,2	0,4	20,3	0,4	20,2	20,8	0,6
779	Libye	22,00	30,00	.0283333	4.48	22,3	22,7	0,5	22,2	0,6	22,2	0,6	22,2	0,6	22,2	23,0	0,8
780	Libye	22,00	29,00	.0372648	5.67	22,4	22,9	0,5	22,3	0,6	22,2	0,7	22,2	0,7	22,3	23,2	0,9
781	Libye	22,00	28,00	.0356351	5.75	22,0	22,5	0,5	21,8	0,7	21,8	0,7	21,8	0,7	21,8	22,8	0,9
782	Libye	22,00	27,00	.0371808	4.86	22,9	23,5	0,6	22,8	0,7	22,7	0,8	22,7	0,8	22,8	23,8	1,0
783	Libye	22,00	26,00	.0406485	4.54	24,1	24,8	0,7	24,0	0,8	23,9	0,8	23,9	0,9	24,0	25,1	1,1
784	Libye	22,00	25,00	.049086	5.36	24,7	25,4	0,7	24,6	0,9	24,5	0,9	24,4	1,0	24,6	25,8	1,2
785	Libye	22,00	24,00	.0544624	5.74	23,0	23,8	0,8	22,9	0,9	22,8	1,0	22,7	1,1	22,9	24,2	1,3
786	Libye	22,00	23,00	.0570497	5.99	23,1	24,0	0,8	23,0	0,9	23,0	1,0	22,9	1,1	23,0	24,4	1,4
787	Libye	22,00	22,00	.0579671	6.61	24,1	25,0	0,8	24,0	0,9	24,0	1,0	23,9	1,0	24,0	25,5	1,4
788	Libye	22,00	21,00	.0563542	7.07	25,9	26,7	0,8	25,8	0,9	25,7	0,9	25,7	1,0	25,8	27,2	1,4
789	Libye	22,00	20,00	.0539684	6.91	26,5	27,2	0,8	26,4	0,9	26,3	0,9	26,4	0,9	26,4	27,8	1,4
790	Libye	23,00	32,00	.0154435	2.47	19,0	19,4	0,4	19,1	0,4	19,1	0,4	19,1	0,4	19,1	19,5	0,5
791	Libye	23,00	31,00	.0168145	2.82	19,6	20,0	0,4	19,6	0,5	19,6	0,5	19,6	0,4	19,6	20,1	0,5
792	Libye	23,00	30,00	.022416	3.67	21,9	22,4	0,5	21,8	0,6	21,8	0,6	21,9	0,5	21,8	22,5	0,7
793	Libye	23,00	29,00	.0285719	4.47	21,5	21,9	0,5	21,3	0,6	21,3	0,6	21,4	0,6	21,3	22,1	0,8
794	Libye	23,00	28,00	.0334241	4.89	21,8	22,3	0,5	21,6	0,7	21,6	0,7	21,6	0,7	21,6	22,5	0,9
795	Libye	23,00	27,00	.039711	5.00	22,9	23,6	0,6	22,8	0,7	22,8	0,8	22,8	0,8	22,8	23,8	1,0
796	Libye	23,00	26,00	.0470665	5.20	23,9	24,6	0,7	23,8	0,8	23,8	0,9	23,7	1,0	23,8	25,0	1,2
797	Libye	23,00	25,00	.0555813	5.72	24,7	25,6	0,8	24,7	0,9	24,6	1,0	24,5	1,1	24,7	26,0	1,3
798	Libye	23,00	24,00	.0598118	5.84	23,7	24,6	0,9	23,6	1,0	23,6	1,0	23,5	1,1	23,6	25,1	1,4
799	Libye	23,00	23,00	.0606384	6.23	22,9	23,8	0,9	22,8	1,0	22,8	1,0	22,7	1,1	22,8	24,3	1,5

ID	Country	LONGITUDE	LATITUDE	param. Estim.	t-stat	T bef SC	T after SC	Variation T	T 30y bef SC	Variation T	T 20y bef SC	Variation T	T 10y bef SC	Variation T	T 30y bef SC	T 2000-08	Variation T
801	Libye	23,00	21,00	.0597782	7.46	24,4	25,3	0,9	24,3	0,9	24,3	1,0	24,3	1,0	24,3	25,8	1,5
802	Libye	23,00	20,00	.0573824	7.49	25,7	26,5	0,8	25,6	0,9	25,6	0,9	25,6	0,9	25,6	27,1	1,5
803	Libye	23,00	19,00	.0546068	6.80	27,3	28,1	0,8	27,2	0,9	27,2	0,9	27,4	0,8	27,2	28,7	1,5
804	Libye	24,00	32,00	.0169657	2.52	18,8	19,1	0,4	18,8	0,3	18,8	0,3	18,6	0,5	18,8	19,2	0,4
805	Libye	24,00	31,00	.0130612	2.11	20,0	20,4	0,4	19,9	0,5	19,9	0,5	19,9	0,4	19,9	20,4	0,5
806	Libye	24,00	30,00	.0159946	2.50	21,3	21,8	0,5	21,2	0,6	21,2	0,6	21,3	0,5	21,2	21,8	0,6
807	Libye	24,00	29,00	.0212063	3.04	21,3	21,8	0,5	21,2	0,6	21,1	0,6	21,2	0,5	21,2	21,8	0,6
808	Libye	24,00	28,00	.0302285	3.91	21,3	21,8	0,5	21,1	0,7	21,1	0,7	21,2	0,6	21,1	21,9	0,8
809	Libye	24,00	27,00	.0413508	4.71	22,1	22,7	0,7	21,9	0,8	21,9	0,8	21,9	0,8	21,9	23,0	1,0
810	Libye	24,00	26,00	.0512735	5.30	22,3	23,0	0,8	22,2	0,9	22,1	0,9	22,0	1,0	22,2	23,4	1,3
811	Libye	24,00	25,00	.0589919	5.75	23,1	23,9	0,9	23,0	0,9	22,9	1,0	22,8	1,1	23,0	24,4	1,4
812	Libye	24,00	24,00	.0626983	6.26	22,8	23,7	0,9	22,8	1,0	22,7	1,0	22,6	1,1	22,8	24,2	1,5
813	Libye	24,00	23,00	.062379	6.75	22,1	23,0	0,9	22,1	1,0	22,0	1,0	21,9	1,1	22,1	23,6	1,5
814	Libye	24,00	22,00	.0631451	7.53	22,3	23,2	0,9	22,2	1,0	22,2	1,0	22,1	1,1	22,2	23,8	1,5
815	Libye	24,00	21,00	.0627924	7.97	23,3	24,2	0,9	23,3	0,9	23,2	1,0	23,2	1,0	23,3	24,8	1,5
816	Libye	24,00	20,00	.060662	7.97	24,9	25,8	0,8	24,8	0,9	24,8	0,9	24,9	0,9	24,8	26,3	1,5
817	Libye	25,00	31,00	.0084476	1.32	19,6	20,0	0,4	19,6	0,4	19,6	0,4	19,6	0,4	19,6	19,9	0,4
818	Libye	25,00	30,00	.0121505	1.73	21,6	22,1	0,5	21,5	0,6	21,4	0,7	21,6	0,5	21,5	22,1	0,5

Annex 3b: Parameter estimates at detailed geographical level (precipitations)

reduction in presipitations
No change in precipitations
increase in precipitations

P° BS Average precipitations before threshold
P° AS Average precipitations after threshold

ID	Country	LONGITUDE	LATITUDE	param. Estimate	t-stat	P° BS	P° AS	Variation P°	P° 1900-1929	P° 1990-2008	Variation P°
1	Algerie			-.2699583	-4.47	100,1	91,1	-9,0%	108,5	89,1	-17,8%
2	Algerie	-9,00	29,00	-.4101891	-2.37	117,4	109,3	-6,9%	138,8	90,1	-35,0%
3	Algerie	-9,00	28,00	-.6480298	-4.50	93,4	70,3	-24,7%	116,8	56,1	-52,0%
4	Algerie	-9,00	27,00	-.7466917	-5.80	81,9	49,0	-40,1%	105,9	42,5	-59,9%
5	Algerie	-9,00	26,00	-.7383431	-6.06	77,3	42,3	-45,3%	100,0	39,4	-60,6%
6	Algerie	-8,00	29,00	-.6171022	-3.95	110,7	87,8	-20,7%	134,3	76,0	-43,4%
7	Algerie	-8,00	28,00	-.7951821	-5.29	87,6	55,4	-36,7%	114,1	44,5	-61,0%
8	Algerie	-8,00	27,00	-.8166185	-5.61	78,9	43,7	-44,6%	105,9	36,2	-65,9%
9	Algerie	-8,00	26,00	-.8073793	-5.87	77,8	40,3	-48,1%	103,5	36,4	-64,8%
10	Algerie	-7,00	29,00	-.7009851	-4.17	116,9	88,0	-24,7%	145,2	81,3	-44,0%
11	Algerie	-7,00	28,00	-.816157	-5.11	90,4	55,2	-38,9%	119,7	48,2	-59,8%
12	Algerie	-7,00	27,00	-.8052683	-5.23	78,5	43,7	-44,3%	105,9	37,1	-65,0%
13	Algerie	-7,00	26,00	-.7059281	-5.40	70,2	39,0	-44,4%	92,5	34,4	-62,9%
14	Algerie	-7,00	25,00	-.5810722	-5.17	64,5	38,8	-39,8%	81,1	35,6	-56,1%
15	Algerie	-6,00	30,00	-.5466175	-2.88	148,4	128,4	-13,5%	178,7	119,7	-33,0%
16	Algerie	-6,00	29,00	-.7166732	-3.90	128,6	98,2	-23,7%	160,9	91,7	-43,0%
17	Algerie	-6,00	28,00	-.7280901	-4.46	91,8	60,4	-34,2%	120,6	56,0	-53,6%
18	Algerie	-6,00	27,00	-.5695756	-4.44	69,8	47,1	-32,4%	89,7	42,9	-52,2%
19	Algerie	-6,00	26,00	-.458319	-4.27	57,9	40,9	-29,3%	71,5	35,7	-50,0%
20	Algerie	-6,00	25,00	-.3709128	-3.89	51,3	37,8	-26,4%	60,7	33,5	-44,8%
21	Algerie	-5,00	30,00	-.3625512	-2.59	99,6	86,9	-12,7%	119,4	79,9	-33,1%
22	Algerie	-5,00	29,00	-.3795811	-2.71	94,3	82,2	-12,9%	114,9	76,9	-33,1%
23	Algerie	-5,00	28,00	-.3521601	-3.32	70,1	58,9	-15,9%	85,6	55,3	-35,4%
24	Algerie	-5,00	27,00	-.3187601	-3.33	56,1	47,0	-16,2%	68,1	42,8	-37,1%
25	Algerie	-5,00	26,00	-.2913873	-3.20	49,6	41,9	-15,4%	59,3	36,8	-37,9%
26	Algerie	-5,00	25,00	-.2976823	-3.31	51,2	42,4	-17,2%	60,6	37,6	-38,0%
27	Algerie	-5,00	24,00	-.2477027	-3.17	52,9	44,6	-15,8%	58,5	40,9	-30,1%
28	Algerie	-4,00	31,00	-.2195265	-2.19	77,3	70,1	-9,4%	86,5	65,9	-23,8%
29	Algerie	-4,00	30,00	-.20062	-2.23	64,4	59,8	-7,2%	74,8	56,5	-24,5%
30	Algerie	-4,00	29,00	-.1953526	-2.43	58,4	55,0	-5,8%	68,0	51,5	-24,3%
31	Algerie	-4,00	28,00	-.250897	-3.74	55,9	49,1	-12,3%	65,5	45,2	-31,1%
32	Algerie	-4,00	27,00	-.2583616	-3.81	46,3	38,8	-16,2%	56,6	36,2	-36,1%
33	Algerie	-4,00	26,00	-.2687601	-3.84	45,5	37,2	-18,2%	55,8	34,6	-38,0%
34	Algerie	-4,00	25,00	-.2507441	-3.75	43,1	34,6	-19,8%	52,0	32,7	-37,1%
35	Algerie	-4,00	24,00	-.1790409	-3.06	47,4	41,5	-12,4%	54,8	40,8	-25,5%
36	Algerie	-4,00	23,00	-.2819488	-3.63	57,2	45,5	-20,5%	65,5	45,0	-31,3%
37	Algerie	-3,00	35,00	-.492782	-1.57	335,0	317,9	-5,1%	330,0	310,9	-5,8%
38	Algerie	-3,00	34,00	-.706713	-2.57	272,4	254,7	-6,5%	282,3	218,6	-22,6%
39	Algerie	-3,00	32,00	-.2013678	-1.53	154,9	149,9	-3,2%	161,0	148,6	-7,7%
40	Algerie	-3,00	31,00	-.2086118	-1.98	72,0	67,5	-6,3%	81,1	66,3	-18,3%
41	Algerie	-3,00	30,00	-.2331804	-2.58	52,4	48,0	-8,3%	62,6	43,3	-30,9%
42	Algerie	-3,00	29,00	-.2505718	-3.43	49,2	42,8	-13,1%	58,0	38,4	-33,8%
43	Algerie	-3,00	28,00	-.2574229	-4.09	41,6	33,7	-19,0%	51,6	31,5	-39,0%
44	Algerie	-3,00	27,00	-.2517274	-4.10	34,5	25,8	-25,1%	45,2	25,9	-42,7%
45	Algerie	-3,00	26,00	-.2341609	-3.93	31,1	22,7	-27,2%	41,1	23,4	-43,0%
46	Algerie	-3,00	25,00	-.20153	-3.60	28,2	20,5	-27,1%	37,1	22,1	-40,5%
47	Algerie	-3,00	24,00	-.1875776	-3.52	33,2	25,3	-23,7%	40,7	27,3	-32,9%
48	Algerie	-3,00	23,00	-.2634621	-3.49	52,6	41,4	-21,3%	61,2	42,1	-31,3%
49	Algerie	-2,00	35,00	-.2170809	-0.68	345,7	355,0	2,7%	339,2	317,9	-6,3%
50	Algerie	-2,00	34,00	-.6368102	-2.43	302,3	287,2	-5,0%	301,6	252,5	-16,3%
51	Algerie	-2,00	33,00	-.3214716	-1.95	205,5	196,0	-4,7%	215,4	197,0	-8,5%
52	Algerie	-2,00	32,00	-.133375	-0.88	100,0	97,3	-2,7%	106,3	102,5	-3,6%
53	Algerie	-2,00	31,00	-.2566898	-2.29	69,2	63,6	-8,1%	79,8	62,0	-22,3%
54	Algerie	-2,00	30,00	-.3490335	-3.80	55,3	45,2	-18,3%	65,2	37,7	-42,1%
55	Algerie	-2,00	29,00	-.3125781	-4.38	46,9	36,9	-21,2%	57,8	33,8	-41,4%
56	Algerie	-2,00	28,00	-.2878955	-4.35	37,0	27,1	-26,9%	48,5	26,8	-44,9%
57	Algerie	-2,00	27,00	-.267257	-4.22	32,3	22,5	-30,2%	43,2	23,1	-46,5%
58	Algerie	-2,00	26,00	-.2368761	-4.06	29,3	20,3	-30,6%	38,9	21,6	-44,5%
59	Algerie	-2,00	25,00	-.1859475	-3.45	26,8	19,5	-27,3%	35,2	21,8	-38,0%
60	Algerie	-2,00	24,00	-.147054	-2.75	28,0	22,4	-19,8%	34,8	24,2	-30,4%
61	Algerie	-2,00	23,00	-.1850023	-2.59	44,2	37,2	-15,8%	51,4	37,4	-27,3%
62	Algerie	-2,00	22,00	-.301681	-2.96	64,6	53,0	-18,0%	74,4	54,4	-26,9%
63	Algerie	-1,00	35,00	-1.00859	-2.25	588,9	571,8	-2,9%	590,9	515,4	-12,8%
64	Algerie	-1,00	34,00	-.6095895	-2.34	312,8	295,2	-5,6%	313,2	274,0	-12,5%
65	Algerie	-1,00	33,00	-.397497	-1.86	171,4	151,4	-11,7%	182,8	172,6	-5,6%
66	Algerie	-1,00	32,00	-.3128663	-1.80	126,4	114,5	-9,5%	137,5	124,5	-9,5%
67	Algerie	-1,00	31,00	-.3291298	-2.83	77,3	67,0	-13,3%	88,9	67,4	-24,2%
68	Algerie	-1,00	30,00	-.3799564	-4.45	51,7	39,1	-24,5%	64,7	35,5	-45,1%
69	Algerie	-1,00	29,00	-.351176	-4.56	40,5	27,8	-31,3%	53,8	27,7	-48,6%
70	Algerie	-1,00	28,00	-.3130284	-4.11	34,8	23,1	-33,8%	47,4	24,8	-47,7%
71	Algerie	-1,00	27,00	-.2822528	-4.16	31,5	20,8	-34,1%	42,6	22,0	-48,3%
72	Algerie	-1,00	26,00	-.2348439	-3.86	28,2	19,3	-31,6%	37,8	21,0	-44,3%
73	Algerie	-1,00	25,00	-.1698628	-3.18	26,0	19,4	-25,2%	33,6	21,9	-34,8%
74	Algerie	-1,00	24,00	-.1189788	-2.21	26,4	22,4	-15,1%	32,4	24,2	-25,4%
75	Algerie	-1,00	23,00	-.1352627	-1.91	40,4	36,0	-10,9%	46,0	35,4	-23,2%

76	Algerie	-1,00	22,00	-.2802354	-2.83	69,4	57,3	-17,4%	76,6	58,4	-23,7%
77	Algerie	-1,00	21,00	-.3382828	-2.83	82,1	68,9	-16,1%	90,7	71,1	-21,6%
78	Algerie	0,00	36,00	-.4438967	-1.36	378,4	364,0	-3,8%	368,8	334,6	-9,3%
79	Algerie	0,00	35,00	-.7485293	-2.39	405,9	387,9	-4,4%	408,5	340,3	-16,7%
80	Algerie	0,00	34,00	-.5101983	-2.04	271,6	247,4	-8,9%	269,3	247,5	-8,1%
81	Algerie	0,00	33,00	-.4911435	-1.91	180,3	151,9	-15,8%	192,0	181,0	-5,7%
82	Algerie	0,00	32,00	-.3731202	-2.03	147,1	127,7	-13,2%	157,4	146,3	-7,0%
83	Algerie	0,00	31,00	-.3860578	-3.48	80,2	64,5	-19,6%	92,5	68,7	-25,8%
84	Algerie	0,00	30,00	-.4341998	-5.29	46,2	28,1	-39,1%	62,5	28,6	-54,2%
85	Algerie	0,00	29,00	-.3899379	-5.01	39,6	23,4	-40,9%	54,8	24,9	-54,5%
86	Algerie	0,00	28,00	-.3158577	-3.94	35,4	22,8	-35,6%	47,5	25,0	-47,3%
87	Algerie	0,00	27,00	-.2522797	-3.83	28,4	18,8	-33,9%	38,5	20,6	-46,5%
88	Algerie	0,00	26,00	-.2017867	-3.48	26,1	18,6	-28,6%	34,7	20,5	-40,8%
89	Algerie	0,00	25,00	-.1544009	-2.95	25,2	19,4	-23,1%	32,0	21,7	-32,2%
90	Algerie	0,00	24,00	-.1060819	-2.01	26,0	22,8	-12,6%	31,3	24,6	-21,5%
91	Algerie	0,00	23,00	-.1114206	-1.57	39,8	36,2	-9,1%	44,1	36,4	-17,3%
92	Algerie	0,00	22,00	-.2517996	-2.41	71,6	59,8	-16,6%	76,6	61,3	-20,0%
93	Algerie	0,00	21,00	-.3222806	-2.51	93,0	78,1	-16,0%	98,2	79,9	-18,7%
94	Algerie	1,00	36,00	-.463666	-1.46	386,5	377,3	-2,4%	384,0	326,6	-15,0%
95	Algerie	1,00	35,00	-.5429905	-1.98	405,3	392,5	-3,2%	408,3	356,8	-12,6%
96	Algerie	1,00	34,00	-.7585377	-2.93	274,4	243,1	-11,4%	282,1	235,1	-16,7%
97	Algerie	1,00	33,00	-.4183282	-2.07	150,2	126,7	-15,7%	157,9	145,4	-7,9%
98	Algerie	1,00	32,00	-.3962246	-2.49	142,4	121,8	-14,4%	152,0	136,7	-10,0%
99	Algerie	1,00	31,00	-.421302	-4.51	57,0	38,0	-33,3%	69,7	42,3	-39,3%
100	Algerie	1,00	30,00	-.3984728	-4.93	45,5	28,1	-38,3%	60,4	30,5	-49,5%
101	Algerie	1,00	29,00	-.3464795	-4.85	38,1	23,3	-38,8%	51,5	25,0	-51,5%
102	Algerie	1,00	28,00	-.2334835	-3.62	27,7	18,8	-31,9%	37,6	21,4	-43,2%
103	Algerie	1,00	27,00	-.1828023	-3.13	22,7	16,1	-29,2%	30,6	18,0	-41,3%
104	Algerie	1,00	26,00	-.1588463	-2.90	23,7	18,3	-22,5%	30,5	19,8	-35,1%
105	Algerie	1,00	25,00	-.1278779	-2.43	24,5	19,9	-18,6%	29,9	22,0	-26,5%
106	Algerie	1,00	24,00	-.0778362	-1.53	24,7	22,7	-8,1%	28,9	24,8	-14,1%
107	Algerie	1,00	23,00	-.0895292	-1.31	38,4	35,6	-7,2%	41,8	37,2	-11,0%
108	Algerie	1,00	22,00	-.2089111	-1.94	72,2	61,8	-14,3%	75,7	65,2	-13,9%
109	Algerie	1,00	21,00	-.2790168	-2.03	90,2	76,1	-15,7%	93,1	78,5	-15,7%
110	Algerie	1,00	20,00	-.2898323	-2.07	107,2	92,6	-13,6%	109,8	96,3	-12,3%
111	Algerie	2,00	36,00	-.4059846	-1.31	473,2	468,2	-1,1%	471,9	424,7	-10,0%
112	Algerie	2,00	35,00	-.2146511	-0.96	332,0	332,4	0,1%	335,2	309,2	-7,8%
113	Algerie	2,00	34,00	-.412301	-2.02	288,1	273,7	-5,0%	294,3	263,4	-10,5%
114	Algerie	2,00	33,00	-.3824289	-2.44	179,5	162,8	-9,3%	187,1	163,0	-12,9%
115	Algerie	2,00	32,00	-.3663006	-3.42	78,7	61,6	-21,7%	89,0	68,1	-23,5%
116	Algerie	2,00	31,00	-.3941998	-3.96	57,5	39,2	-31,8%	72,0	45,9	-36,3%
117	Algerie	2,00	30,00	-.3418145	-4.01	48,6	33,2	-31,6%	61,3	37,4	-39,1%
118	Algerie	2,00	29,00	-.2363571	-3.75	32,7	23,3	-28,7%	42,0	25,0	-40,4%
119	Algerie	2,00	28,00	-.1362404	-2.38	19,6	16,0	-18,5%	25,5	16,5	-35,2%
120	Algerie	2,00	27,00	-.1087267	-1.96	18,1	15,8	-12,9%	22,9	15,8	-31,2%
121	Algerie	2,00	26,00	-.1131406	-2.20	20,9	18,0	-13,9%	26,0	18,8	-27,8%
122	Algerie	2,00	25,00	-.0950357	-1.88	24,1	21,4	-11,4%	28,6	23,3	-18,5%
123	Algerie	2,00	24,00	-.0434788	-0.87	23,6	23,5	-0,8%	27,2	25,8	-5,0%
124	Algerie	2,00	23,00	-.0478677	-0.77	35,8	35,7	-0,3%	38,8	38,2	-1,4%
125	Algerie	2,00	22,00	-.1306042	-1.41	66,3	61,2	-7,7%	69,2	65,2	-5,8%
126	Algerie	2,00	21,00	-.1873941	-1.45	92,7	84,2	-9,2%	95,2	89,1	-6,4%
127	Algerie	2,00	20,00	-.1976768	-1.39	110,8	101,6	-8,3%	112,3	107,6	-4,2%
128	Algerie	2,00	19,00	-.1266064	-0.79	133,9	128,9	-3,7%	134,8	139,3	3,4%
129	Algerie	3,00	36,00	-.3457502	-1.03	430,9	436,1	1,2%	431,6	374,1	-13,3%
130	Algerie	3,00	35,00	-.153566	-0.64	335,0	338,7	1,1%	339,8	319,2	-6,1%
131	Algerie	3,00	34,00	-.0772097	-0.40	181,3	181,8	0,3%	183,3	163,8	-10,6%
132	Algerie	3,00	33,00	-.2060606	-1.61	115,4	108,5	-6,0%	123,9	107,5	-13,3%
133	Algerie	3,00	32,00	-.3567918	-3.97	54,2	38,5	-29,0%	66,3	39,9	-39,7%
134	Algerie	3,00	31,00	-.337611	-2.91	56,5	40,8	-27,9%	71,0	49,3	-30,6%
135	Algerie	3,00	30,00	-.3324465	-3.32	55,2	39,7	-28,1%	67,2	45,3	-32,6%
136	Algerie	3,00	29,00	-.1964702	-2.95	32,1	24,6	-23,2%	39,8	27,4	-31,3%
137	Algerie	3,00	28,00	-.1028746	-1.76	18,4	16,4	-10,5%	22,3	16,8	-24,7%
138	Algerie	3,00	27,00	-.0897498	-1.58	17,1	15,9	-7,1%	20,4	15,2	-25,3%
139	Algerie	3,00	26,00	-.0845204	-1.70	18,6	17,3	-7,4%	22,6	17,7	-21,5%
140	Algerie	3,00	25,00	-.0671838	-1.37	23,3	22,5	-3,2%	27,3	24,0	-12,1%
141	Algerie	3,00	24,00	-.0271078	-0.50	28,9	30,3	4,9%	32,1	32,6	1,5%
142	Algerie	3,00	23,00	-.0179455	-0.27	35,6	38,0	6,7%	38,4	39,9	4,1%
143	Algerie	3,00	22,00	-.0531054	-0.65	56,2	56,7	0,9%	58,6	60,0	2,4%
144	Algerie	3,00	21,00	-.0903605	-0.80	86,0	83,8	-2,6%	88,2	89,8	1,8%
145	Algerie	3,00	20,00	-.1237717	-0.87	115,3	111,2	-3,6%	117,0	119,3	1,9%
146	Algerie	3,00	19,00	-.0934427	-0.57	139,7	137,3	-1,7%	141,5	149,6	5,7%
147	Algerie	3,00	18,00	-.1015865	-0.52	179,3	178,6	-0,4%	180,0	189,7	5,4%
148	Algerie	4,00	37,00	.0782866	0.17	703,2	741,2	5,4%	697,5	675,3	-3,2%
149	Algerie	4,00	36,00	-.5215486	-1.68	332,2	321,3	-3,3%	334,3	269,9	-19,3%
150	Algerie	4,00	35,00	-.1725262	-0.71	297,5	299,4	0,7%	302,9	282,9	-6,6%
151	Algerie	4,00	34,00	-.0577963	-0.36	215,9	218,0	1,0%	221,0	212,0	-4,1%
152	Algerie	4,00	33,00	-.1639894	-1.39	90,7	85,0	-6,2%	102,3	93,3	-8,9%
153	Algerie	4,00	32,00	-.2248309	-2.22	64,7	57,0	-11,9%	77,6	62,0	-20,1%
154	Algerie	4,00	31,00	-.3096423	-3.01	57,3	43,7	-23,7%	70,7	50,8	-28,1%
155	Algerie	4,00	30,00	-.3383709	-3.26	55,4	40,2	-27,5%	68,1	46,0	-32,4%
156	Algerie	4,00	29,00	-.2165416	-2.95	35,5	27,2	-23,5%	43,6	30,2	-30,8%
157	Algerie	4,00	28,00	-.1364554	-2.29	20,5	16,7	-18,7%	25,6	17,6	-31,2%
158	Algerie	4,00	27,00	-.1042971	-1.86	17,5	15,5	-11,7%	21,4	15,4	-28,1%
159	Algerie	4,00	26,00	-.0730303	-1.42	18,9	18,3	-2,9%	22,5	18,5	-18,1%
160	Algerie	4,00	25,00	-.0783968	-1.34	32,5	32,2	-1,1%	36,8	33,1	-10,0%
161	Algerie	4,00	24,00	-.0322788	-0.46	38,9	41,2	6,1%	42,4	43,0	1,3%
162	Algerie	4,00	23,00	.0058512	0.07	41,4	45,9	10,9%	44,1	47,8	8,3%
163	Algerie	4,00	22,00	-.0001168	-0.00	47,7	51,9	8,9%	49,9	54,5	9,3%
164	Algerie	4,00	21,00	-.0588676	-0.60	63,9	64,5	1,0%	66,7	68,6	2,9%
165	Algerie	4,00	20,00	-.0872885	-0.67	104,0	102,5	-1,5%	105,9	110,1	4,0%

166	Algerie	4,00	19,00	-.0830627	-0.50	148,5	147,2	-0,9%	149,3	158,8	6,3%
167	Algerie	5,00	36,00	-.5485868	-2.07	290,1	269,5	-7,1%	301,4	253,0	-16,1%
168	Algerie	5,00	35,00	-.3269196	-1.82	178,2	170,4	-4,4%	186,5	161,0	-13,7%
169	Algerie	5,00	34,00	-.200973	-1.68	120,4	116,5	-3,3%	128,2	115,0	-10,3%
170	Algerie	5,00	33,00	-.1760513	-1.79	71,1	66,5	-6,4%	81,0	70,1	-13,4%
171	Algerie	5,00	32,00	-.2267575	-2.13	62,7	55,4	-11,6%	73,4	56,2	-23,4%
172	Algerie	5,00	31,00	-.2917765	-2.96	60,1	48,5	-19,3%	71,6	52,1	-27,3%
173	Algerie	5,00	30,00	-.3396432	-3.30	54,4	39,7	-26,9%	66,8	44,4	-33,6%
174	Algerie	5,00	29,00	-.2527106	-3.11	35,4	25,2	-28,8%	45,0	29,0	-35,5%
175	Algerie	5,00	28,00	-.1765518	-2.66	25,1	19,2	-23,8%	32,0	21,4	-33,0%
176	Algerie	5,00	27,00	-.1179131	-2.03	21,5	18,6	-13,4%	26,5	19,8	-25,3%
177	Algerie	5,00	26,00	-.0766203	-1.38	22,0	21,8	-0,8%	26,2	22,0	-15,7%
178	Algerie	5,00	25,00	-.0968103	-1.36	47,3	46,8	-1,0%	52,4	47,8	-8,7%
179	Algerie	5,00	24,00	-.0503216	-0.58	46,9	49,4	5,2%	51,1	50,3	-1,6%
180	Algerie	5,00	23,00	.0284237	0.30	44,3	50,7	14,4%	46,6	52,1	11,8%
181	Algerie	5,00	22,00	.0122945	0.13	44,1	49,5	12,2%	46,2	50,9	10,2%
182	Algerie	5,00	21,00	-.1044917	-1.10	51,8	50,8	-1,8%	56,4	52,5	-7,0%
183	Algerie	5,00	20,00	-.203249	-1.86	78,3	70,9	-9,4%	82,7	75,1	-9,2%
184	Algerie	5,00	19,00	-.176524	-1.07	179,8	172,0	-4,3%	175,0	180,7	3,2%
185	Algerie	6,00	37,00	-.7008888	-1.87	1063,2	1032,3	-2,9%	1087,1	1029,6	-5,3%
186	Algerie	6,00	36,00	-.654994	-2.65	377,3	356,4	-5,5%	398,8	342,4	-14,1%
187	Algerie	6,00	35,00	-.4335039	-2.16	149,1	135,8	-8,9%	154,9	126,5	-18,4%
188	Algerie	6,00	34,00	-.224387	-1.96	85,6	80,9	-5,5%	94,1	83,1	-11,7%
189	Algerie	6,00	33,00	-.1672727	-1.72	65,7	60,8	-7,5%	73,0	66,4	-8,9%
190	Algerie	6,00	32,00	-.2982448	-2.80	61,7	50,4	-18,3%	70,1	48,2	-31,3%
191	Algerie	6,00	31,00	-.2853637	-2.98	60,5	49,6	-18,0%	69,8	49,8	-28,6%
192	Algerie	6,00	30,00	-.3230766	-3.39	47,0	33,3	-29,2%	58,6	36,4	-38,0%
193	Algerie	6,00	29,00	-.2650653	-2.91	34,5	23,6	-31,6%	45,0	28,1	-37,5%
194	Algerie	6,00	28,00	-.1794727	-2.28	28,4	22,2	-21,9%	36,2	26,0	-28,1%
195	Algerie	6,00	27,00	-.1195181	-1.84	26,5	23,5	-11,4%	32,5	26,1	-19,6%
196	Algerie	6,00	26,00	-.1003883	-1.66	30,7	29,5	-4,0%	36,4	31,0	-14,6%
197	Algerie	6,00	25,00	-.1077824	-1.50	48,4	47,5	-2,0%	54,0	48,6	-10,0%
198	Algerie	6,00	24,00	-.091744	-1.00	49,6	50,5	1,8%	54,7	50,3	-8,1%
199	Algerie	6,00	23,00	-.0429386	-0.43	47,7	51,4	7,6%	51,2	50,4	-1,6%
200	Algerie	6,00	22,00	-.0259642	-0.27	45,6	49,5	8,6%	48,2	48,7	1,0%
201	Algerie	6,00	21,00	-.1503364	-1.56	54,5	50,7	-7,0%	59,0	51,5	-12,8%
202	Algerie	6,00	20,00	-.2424243	-2.11	89,5	78,0	-12,8%	90,9	82,4	-9,3%
203	Algerie	6,00	19,00	-.2893587	-1.74	157,6	140,0	-11,1%	148,7	148,4	-0,2%
204	Algerie	7,00	37,00	-.0915652	-0.25	774,1	779,6	0,7%	797,3	796,5	-0,1%
205	Algerie	7,00	36,00	-.7070326	-2.47	458,9	440,7	-4,0%	486,4	428,3	-11,9%
206	Algerie	7,00	35,00	-.2804568	-1.75	366,3	362,2	-1,1%	375,6	359,9	-4,2%
207	Algerie	7,00	34,00	-.0995867	-0.94	73,3	72,6	-0,9%	78,3	77,8	-0,6%
208	Algerie	7,00	33,00	-.1316597	-1.27	69,9	67,1	-4,1%	75,2	70,7	-5,9%
209	Algerie	7,00	32,00	-.1952729	-2.16	60,4	53,9	-10,8%	66,9	55,7	-16,8%
210	Algerie	7,00	31,00	-.2464869	-2.91	59,1	49,8	-15,8%	65,7	47,8	-27,3%
211	Algerie	7,00	30,00	-.2834167	-3.13	43,4	30,8	-28,9%	53,5	32,1	-39,9%
212	Algerie	7,00	29,00	-.2314494	-2.52	35,6	26,1	-26,7%	45,2	29,4	-35,0%
213	Algerie	7,00	28,00	-.1649226	-1.86	29,3	23,9	-18,5%	37,4	28,2	-24,5%
214	Algerie	7,00	27,00	-.1294125	-1.71	26,4	23,2	-12,3%	33,1	26,0	-21,4%
215	Algerie	7,00	26,00	-.0964359	-1.48	25,8	25,0	-3,1%	31,6	25,4	-19,5%
216	Algerie	7,00	25,00	-.1180919	-1.77	37,7	36,1	-4,3%	43,5	36,6	-16,0%
217	Algerie	7,00	24,00	-.1041618	-1.33	44,3	44,0	-0,7%	49,7	43,9	-11,6%
218	Algerie	7,00	23,00	-.0777722	-0.88	46,1	47,6	3,2%	50,6	47,0	-7,1%
219	Algerie	7,00	22,00	-.0765026	-0.85	48,5	49,2	1,6%	51,8	49,0	-5,4%
220	Algerie	7,00	21,00	-.1917561	-1.98	61,8	54,5	-11,8%	65,3	55,7	-14,7%
221	Algerie	7,00	20,00	-.3066129	-2.53	95,2	78,5	-17,6%	95,1	83,5	-12,2%
222	Algerie	8,00	36,00	-.3500519	-1.28	411,4	406,6	-1,2%	426,2	406,7	-4,6%
223	Algerie	8,00	35,00	-.0160263	-0.09	252,9	261,2	3,3%	256,9	266,3	3,7%
224	Algerie	8,00	34,00	-.0629868	-0.49	98,3	102,8	4,6%	102,3	104,0	1,7%
225	Algerie	8,00	33,00	-.0693059	-0.61	78,9	80,9	2,5%	82,2	81,2	-1,3%
226	Algerie	8,00	32,00	-.1722899	-2.00	62,6	57,5	-8,2%	66,8	54,0	-19,1%
227	Algerie	8,00	31,00	-.2584719	-3.21	48,7	36,0	-26,0%	54,6	34,5	-36,9%
228	Algerie	8,00	30,00	-.2798869	-3.20	42,9	28,5	-33,5%	51,7	30,0	-41,9%
229	Algerie	8,00	29,00	-.2455722	-2.84	38,1	26,6	-30,3%	48,5	29,5	-39,2%
230	Algerie	8,00	28,00	-.1521768	-1.96	29,9	24,9	-16,7%	37,4	28,0	-25,3%
231	Algerie	8,00	27,00	-.131504	-1.65	25,9	23,0	-11,3%	32,8	25,2	-23,0%
232	Algerie	8,00	26,00	-.1224418	-1.69	25,0	23,0	-8,1%	31,6	23,5	-25,7%
233	Algerie	8,00	25,00	-.1379214	-2.15	28,3	25,8	-8,8%	34,7	24,6	-29,0%
234	Algerie	8,00	24,00	-.1321017	-2.00	34,1	32,0	-6,0%	40,0	30,7	-23,2%
235	Algerie	8,00	23,00	-.1515893	-2.02	41,6	38,7	-7,0%	47,8	37,9	-20,7%
236	Algerie	8,00	22,00	-.1509619	-1.85	50,5	46,3	-8,3%	55,0	46,8	-14,9%
237	Algerie	8,00	21,00	-.2532898	-2.60	65,6	53,4	-18,7%	68,8	55,2	-19,8%
238	Algerie	9,00	32,00	-.1934659	-1.74	78,9	73,8	-6,5%	80,8	57,6	-28,7%
239	Algerie	9,00	31,00	-.2524233	-2.82	51,6	39,3	-23,9%	57,2	34,5	-39,7%
240	Algerie	9,00	30,00	-.2474293	-2.86	44,7	30,8	-31,2%	51,5	32,5	-37,0%
241	Algerie	9,00	29,00	-.2315309	-2.82	39,2	26,6	-32,1%	48,8	30,3	-37,9%
242	Algerie	9,00	28,00	-.2004587	-2.86	34,2	25,6	-25,2%	42,9	27,9	-35,1%
243	Algerie	9,00	27,00	-.1059865	-1.53	26,9	25,0	-7,1%	33,3	27,3	-17,9%
244	Algerie	9,00	26,00	-.1369966	-1.95	25,1	22,2	-11,6%	31,7	22,2	-29,8%
245	Algerie	9,00	25,00	-.1788212	-2.71	25,2	20,7	-17,9%	31,9	17,2	-46,1%
246	Algerie	9,00	24,00	-.1864359	-3.03	28,0	23,0	-17,9%	34,6	19,6	-43,2%
247	Algerie	9,00	23,00	-.2231647	-2.97	35,5	28,7	-19,4%	43,4	26,8	-38,2%
248	Algerie	9,00	22,00	-.2495051	-3.14	48,9	38,7	-21,0%	55,3	39,2	-29,1%
249	Algerie	9,00	21,00	-.3269762	-3.39	64,2	47,1	-26,7%	68,8	49,2	-28,6%
250	Algerie	10,00	25,00	-.2188351	-3.24	25,1	18,5	-26,1%	32,1	14,0	-56,4%
251	Algerie	10,00	24,00	-.2386137	-3.64	27,7	20,1	-27,3%	35,3	16,0	-54,7%
252	Algerie	10,00	23,00	-.3173126	-3.69	33,8	22,0	-35,0%	44,1	19,2	-56,4%
253	Algerie	10,00	22,00	-.3598749	-4.36	47,4	31,2	-34,3%	56,9	31,1	-45,3%
254	Algerie	11,00	24,00	-.3154805	-4.49	30,3	18,7	-38,2%	40,4	15,4	-61,8%
255	Algerie	11,00	23,00	-.3943898	-4.48	36,0	19,9	-44,8%	48,2	17,5	-63,8%
256	Algerie	11,00	22,00	-.4305579	-5.21	43,3	23,2	-46,3%	55,0	22,3	-59,5%

257	Egypte			-.1067964	-2.38	33,6	22,1	-34,3%	36,3	33,1	-8,8%
258	Egypte	24,00	30,00	-.3212761	-2.76	56,1	28,3	-49,5%	60,1	42,6	-29,2%
259	Egypte	24,00	29,00	-.345323	-3.26	46,9	18,2	-61,2%	51,8	32,3	-37,7%
260	Egypte	25,00	31,00	-.2819424	-1.92	110,7	86,1	-22,3%	114,4	97,2	-15,1%
261	Egypte	25,00	30,00	-.2493152	-2.20	47,8	24,7	-48,4%	52,4	40,7	-22,3%
262	Egypte	25,00	29,00	-.2734807	-2.64	41,5	17,7	-57,4%	46,8	32,1	-31,3%
263	Egypte	25,00	28,00	-.3264294	-3.63	38,4	13,4	-65,1%	43,4	22,1	-49,0%
264	Egypte	25,00	27,00	-.354564	-4.52	33,5	7,6	-77,4%	38,4	12,9	-66,5%
265	Egypte	25,00	26,00	-.3558697	-4.96	30,5	4,3	-85,8%	35,4	8,7	-75,5%
266	Egypte	25,00	25,00	-.3321157	-4.88	27,8	3,3	-88,1%	32,5	7,4	-77,3%
267	Egypte	25,00	24,00	-.3046567	-4.56	25,9	3,3	-87,2%	30,6	7,7	-74,9%
268	Egypte	25,00	23,00	-.1497924	-3.03	15,9	3,8	-76,1%	18,8	9,7	-48,1%
269	Egypte	25,00	22,00	-.0741757	-1.79	14,4	6,2	-57,0%	16,3	14,1	-13,7%
270	Egypte	26,00	31,00	-.1339431	-0.84	134,8	120,8	-10,4%	139,0	134,9	-2,9%
271	Egypte	26,00	30,00	-.2005004	-1.75	49,2	28,6	-41,9%	53,8	47,0	-12,7%
272	Egypte	26,00	29,00	-.2383468	-2.39	37,2	15,6	-58,1%	42,3	30,5	-27,9%
273	Egypte	26,00	28,00	-.2884311	-3.51	34,7	12,0	-65,4%	39,3	21,1	-46,3%
274	Egypte	26,00	27,00	-.2930637	-4.31	29,7	7,9	-73,4%	33,9	13,7	-59,5%
275	Egypte	26,00	26,00	-.2838745	-4.68	26,0	4,6	-82,3%	30,2	10,3	-66,0%
276	Egypte	26,00	25,00	-.2477009	-4.57	22,7	3,7	-83,6%	26,7	9,3	-64,9%
277	Egypte	26,00	24,00	-.2023686	-4.05	19,3	3,6	-81,2%	22,8	9,2	-59,6%
278	Egypte	26,00	23,00	-.062832	-1.80	11,0	4,2	-61,9%	13,0	11,3	-12,7%
279	Egypte	26,00	22,00	-.0408053	-0.87	13,7	6,3	-54,0%	15,9	17,2	8,4%
280	Egypte	27,00	31,00	-.0612816	-0.37	154,6	138,3	-10,5%	154,4	160,4	3,9%
281	Egypte	27,00	30,00	-.152175	-1.31	69,4	51,6	-25,6%	71,5	68,1	-4,7%
282	Egypte	27,00	29,00	-.2073191	-2.46	36,5	16,8	-54,0%	39,9	31,1	-22,1%
283	Egypte	27,00	28,00	-.2377101	-3.51	29,0	10,0	-65,3%	32,7	18,5	-43,4%
284	Egypte	27,00	27,00	-.233236	-4.21	24,4	6,6	-72,9%	28,0	13,1	-53,3%
285	Egypte	27,00	26,00	-.2280169	-4.38	23,2	5,0	-78,3%	27,1	12,6	-53,5%
286	Egypte	27,00	25,00	-.2048559	-4.31	21,7	5,1	-76,6%	25,2	12,5	-50,3%
287	Egypte	27,00	24,00	-.1216393	-3.18	16,0	5,4	-65,9%	18,5	12,7	-31,1%
288	Egypte	27,00	23,00	-.0398703	-1.11	12,7	6,2	-50,7%	14,6	15,5	6,3%
289	Egypte	27,00	22,00	-.0081735	-0.14	16,1	9,8	-38,9%	18,2	23,6	29,4%
290	Egypte	28,00	31,00	-.0617005	-0.37	136,9	119,9	-12,4%	135,1	139,3	3,1%
291	Egypte	28,00	30,00	-.0717125	-0.61	111,2	98,7	-11,3%	111,7	112,1	0,4%
292	Egypte	28,00	29,00	-.2025438	-3.00	32,9	13,3	-59,8%	34,9	26,1	-25,3%
293	Egypte	28,00	28,00	-.1908285	-3.67	23,3	7,4	-68,3%	26,6	15,4	-42,2%
294	Egypte	28,00	27,00	-.1712835	-3.83	19,4	5,5	-71,9%	22,6	12,7	-44,1%
295	Egypte	28,00	26,00	-.1744241	-3.86	19,8	4,8	-75,8%	23,2	13,7	-40,8%
296	Egypte	28,00	25,00	-.1466518	-3.37	19,3	5,7	-70,2%	22,1	15,5	-30,1%
297	Egypte	28,00	24,00	-.0874951	-2.42	16,3	7,1	-56,3%	18,4	16,5	-10,5%
298	Egypte	28,00	23,00	-.0223612	-0.51	15,7	9,3	-40,7%	17,6	21,0	19,3%
299	Egypte	28,00	22,00	.0402335	0.60	17,2	13,1	-23,5%	19,1	30,3	58,2%
300	Egypte	29,00	31,00	.034387	0.23	135,3	128,5	-5,0%	137,5	146,0	6,2%
301	Egypte	29,00	30,00	-.068723	-0.70	93,0	83,6	-10,1%	95,2	92,7	-2,6%
302	Egypte	29,00	29,00	-.181631	-3.58	27,7	10,9	-60,5%	30,5	19,7	-35,5%
303	Egypte	29,00	28,00	-.1524975	-3.86	19,1	6,2	-67,5%	22,3	12,3	-44,7%
304	Egypte	29,00	27,00	-.1431026	-3.75	17,2	4,9	-71,5%	20,2	12,2	-39,6%
305	Egypte	29,00	26,00	-.1516189	-3.58	18,2	4,4	-76,0%	21,2	13,4	-36,9%
306	Egypte	29,00	25,00	-.1172866	-2.72	18,0	6,7	-62,8%	20,6	16,4	-20,5%
307	Egypte	29,00	24,00	-.072731	-1.99	15,6	7,4	-52,3%	17,7	16,5	-6,9%
308	Egypte	29,00	23,00	-.0111574	-0.24	13,2	7,2	-45,9%	15,2	19,7	29,7%
309	Egypte	29,00	22,00	.0890742	1.18	16,1	13,4	-17,0%	17,9	34,3	91,7%
310	Egypte	30,00	31,00	-.0170207	-0.11	138,4	136,0	-1,8%	143,4	142,6	-0,6%
311	Egypte	30,00	30,00	-.1271884	-1.91	46,3	37,6	-18,9%	49,5	39,8	-19,5%
312	Egypte	30,00	29,00	-.1502141	-3.93	22,5	9,9	-56,2%	25,8	15,3	-40,8%
313	Egypte	30,00	28,00	-.1538032	-4.46	17,7	5,4	-69,2%	20,6	9,7	-52,7%
314	Egypte	30,00	27,00	-.13914	-3.64	18,5	7,0	-62,4%	21,2	13,0	-38,7%
315	Egypte	30,00	26,00	-.1190353	-3.07	16,0	4,9	-69,6%	18,8	13,4	-28,7%
316	Egypte	30,00	25,00	-.0888333	-2.41	14,2	5,3	-62,6%	16,4	13,8	-15,9%
317	Egypte	30,00	24,00	-.0577046	-1.68	12,8	6,0	-53,1%	14,6	13,9	-4,4%
318	Egypte	30,00	23,00	-.0088787	-0.19	11,7	6,1	-48,2%	13,3	17,7	33,0%
319	Egypte	30,00	22,00	.0889278	1.18	15,2	12,0	-21,4%	16,7	33,1	98,2%
320	Egypte	31,00	31,00	-.0485164	-0.56	66,0	60,9	-7,7%	69,6	68,3	-1,9%
321	Egypte	31,00	30,00	-.0581577	-1.16	26,3	21,1	-19,9%	29,1	27,2	-6,6%
322	Egypte	31,00	29,00	-.1306858	-3.79	20,8	10,5	-49,5%	23,7	14,0	-41,0%
323	Egypte	31,00	28,00	-.1451617	-4.78	16,3	5,2	-67,8%	18,7	8,1	-57,0%
324	Egypte	31,00	27,00	-.1058447	-2.21	18,5	9,6	-48,0%	20,3	15,9	-21,9%
325	Egypte	31,00	26,00	-.0803012	-2.13	12,2	4,1	-66,7%	14,5	12,2	-15,7%
326	Egypte	31,00	25,00	-.0596099	-1.89	10,8	4,4	-58,6%	12,2	11,4	-6,2%
327	Egypte	31,00	24,00	-.0488388	-1.55	10,2	4,2	-58,4%	11,6	11,2	-3,0%
328	Egypte	31,00	23,00	-.0608053	-1.51	12,4	4,9	-60,7%	13,8	12,5	-9,1%
329	Egypte	31,00	22,00	-.0303132	-0.53	14,9	7,5	-49,6%	16,0	19,7	23,0%
330	Egypte	32,00	31,00	-.0789612	-1.23	64,6	57,7	-10,7%	67,6	60,4	-10,6%
331	Egypte	32,00	30,00	-.0463757	-0.94	30,2	25,9	-14,3%	33,5	31,1	-7,2%
332	Egypte	32,00	29,00	-.1014494	-2.80	21,4	13,8	-35,3%	24,3	17,5	-28,0%
333	Egypte	32,00	28,00	-.1061051	-3.14	15,3	6,3	-59,1%	17,4	11,7	-32,9%
334	Egypte	32,00	27,00	-.0805282	-1.97	14,7	6,9	-53,1%	16,5	14,5	-12,2%
335	Egypte	32,00	26,00	-.0624734	-1.94	11,1	4,4	-59,9%	12,8	12,0	-6,5%
336	Egypte	32,00	25,00	-.0622296	-2.29	9,9	3,7	-63,1%	11,2	9,6	-14,1%
337	Egypte	32,00	24,00	-.0679159	-2.34	10,4	3,5	-66,6%	11,6	9,0	-22,7%
338	Egypte	32,00	23,00	-.06067	-1.29	13,9	5,5	-60,7%	15,4	15,2	-1,2%
339	Egypte	32,00	22,00	.0171801	0.25	15,9	9,2	-42,3%	16,8	27,0	60,5%
340	Egypte	33,00	31,00	-.1923909	-2.66	65,2	51,8	-20,6%	69,2	53,0	-23,3%
341	Egypte	33,00	30,00	-.1447289	-2.45	36,9	29,0	-21,5%	42,3	28,9	-31,7%
342	Egypte	33,00	29,00	-.1125466	-3.25	24,9	18,1	-27,2%	27,6	20,1	-27,3%
343	Egypte	33,00	28,00	-.0695302	-1.96	16,8	10,4	-37,9%	18,4	17,0	-7,6%
344	Egypte	33,00	27,00	-.0542674	-1.47	13,2	6,6	-49,5%	14,7	15,4	5,0%
345	Egypte	33,00	26,00	-.045639	-1.44	11,5	4,9	-57,6%	12,6	12,8	1,8%
346	Egypte	33,00	25,00	-.058129	-2.32	9,9	4,1	-59,0%	10,8	9,1	-15,2%
347	Egypte	33,00	24,00	-.1036252	-3.46	11,9	2,9	-75,6%	13,1	7,2	-45,0%
348	Egypte	33,00	23,00	.0301974	0.41	16,2	8,9	-44,7%	17,8	29,0	63,2%
349	Egypte	33,00	22,00	.411163	2.54	19,2	23,5	22,8%	20,0	75,4	276,8%
350	Egypte	34,00	31,00	-.8187508	-5.29	157,6	113,6	-27,9%	168,9	105,2	-37,7%
351	Egypte	34,00	30,00	-.5312881	-7.86	58,7	31,7	-46,1%	65,5	24,1	-63,2%
352	Egypte	34,00	29,00	-.2093031	-4.61	28,7	17,4	-39,4%	31,8	16,4	-48,4%
353	Egypte	34,00	28,00	-.106523	-2.49	19,4	12,7	-34,6%	21,6	16,7	-22,5%
354	Egypte	34,00	27,00	-.0419563	-1.01	18,5	12,4	-32,9%	20,0	21,6	8,1%
355	Egypte	34,00	26,00	-.0459865	-1.40	20,2	14,8	-26,7%	20,7	20,3	-1,9%
356	Egypte	34,00	25,00	-.051189	-1.91	11,8	6,2	-47,4%	12,3	11,2	-9,0%
357	Egypte	34,00	24,00	-.0982244	-2.71	14,2	4,4	-69,0%	15,6	11,3	-27,6%
358	Egypte	34,00	23,00	.088154	0.88	20,4	12,8	-37,4%	22,5	41,3	84,1%
359	Egypte	34,00	22,00	.6443592	2.80	24,5	34,2	39,7%	25,8	108,9	321,4%
360	Egypte	35,00	24,00	-.0842461	-1.74	25,6	15,3	-40,1%	27,5	24,6	-10,6%
361	Egypte	35,00	23,00	.1064897	0.94	37,5	30,9	-17,4%	39,8	62,2	56,1%
362	Egypte	35,00	22,00	.6894597	2.82	52,1	66,4	27,4%	52,9	143,7	171,9%
363	Egypte	36,00	22,00	.3878742	2.02	63,2	73,1	15,8%	64,2	127,2	98,3%

364	Israel			-1.852597	-9.61	240,1	159,0	-33,8%	298,2	145,9	-51,1%
365	Israel	34,00	31,00	-.8187508	-5.29	142,4	108,1	-24,1%	168,9	105,2	-37,7%
366	Israel	34,00	30,00	-.5312881	-7.86	51,0	26,3	-48,4%	65,5	24,1	-63,2%
367	Israel	34,00	29,00	-.2093031	-4.61	24,7	16,6	-32,7%	31,8	16,4	-48,4%
368	Israel	34,25	32,00	-1.501741	-5.81	259,2	195,2	-24,7%	304,4	188,7	-38,0%
369	Israel	35,00	32,00	-1.732267	-4.26	489,5	424,9	-13,2%	549,2	402,1	-26,8%
370	Israel	35,00	31,00	-1.365654	-5.86	227,1	173,3	-23,7%	272,4	161,6	-40,7%
371	Israel	35,00	30,00	-1.12849	-9.25	92,8	38,0	-59,1%	117,9	27,1	-77,0%
372	Israel	35,00	29,00	-.3184172	-5.25	28,8	17,7	-38,4%	40,3	16,1	-60,1%
373	Israel	35,25	33,00	-9.067457	-13.03	845,7	430,8	-49,1%	1133,3	371,7	-67,2%
374	Jordanie			-1.570622	-7.86	219,0	132,6	-39,4%	238,3	108,3	-54,6%
375	Jordanie	34,00	29,00	-.2093031	-4.61	29,4	17,6	-40,3%	31,8	16,4	-48,4%
376	Jordanie	35,00	32,00	-1.732267	-4.26	524,7	435,4	-17,0%	549,2	402,1	-26,8%
377	Jordanie	35,00	31,00	-1.365654	-5.86	259,1	180,5	-30,3%	272,4	161,6	-40,7%
378	Jordanie	35,00	30,00	-1.12849	-9.25	108,2	52,6	-51,4%	117,9	27,1	-77,0%
379	Jordanie	35,00	29,00	-.3184172	-5.25	36,9	18,3	-50,4%	40,3	16,1	-60,1%
380	Jordanie	36,00	32,00	-1.576681	-4.53	373,5	289,6	-22,5%	403,0	265,4	-34,1%
381	Jordanie	36,00	31,00	-1.411138	-4.91	351,1	269,8	-23,1%	373,4	255,2	-31,7%
382	Jordanie	36,00	30,00	-1.474653	-8.20	163,3	87,9	-46,2%	178,5	64,6	-63,8%
383	Jordanie	36,00	29,00	-.9380058	-7.98	97,6	50,2	-48,6%	107,1	29,8	-72,2%
384	Jordanie	37,00	32,00	-2.2336	-8.97	213,8	89,6	-58,1%	240,2	57,0	-76,3%
385	Jordanie	37,00	31,00	-2.093922	-9.02	194,2	84,9	-56,3%	216,9	43,1	-80,1%
386	Jordanie	37,00	30,00	-1.904949	-9.03	174,9	75,8	-56,7%	194,3	42,9	-77,9%
387	Jordanie	37,00	29,00	-1.338495	-8.17	128,1	59,8	-53,3%	141,9	29,4	-79,3%
388	Jordanie	38,00	33,00	-2.411903	-8.76	293,5	149,2	-49,1%	325,6	124,3	-61,8%
389	Jordanie	38,00	32,00	-2.335241	-9.07	261,0	126,9	-51,4%	289,7	95,9	-66,9%
390	Jordanie	38,00	31,00	-2.174951	-8.92	217,8	99,1	-54,5%	243,5	63,9	-73,7%
391	Jordanie	39,00	32,00	-2.052901	-7.76	295,3	167,1	-43,4%	324,8	145,6	-55,2%
392	Liban			-5.446628	-11.07	865,3	622,4	-28,1%	1035,0	568,0	-45,1%
393	Liban	35,25	34,00	-5.820722	-11.19	840,4	575,4	-31,5%	1014,6	517,7	-49,0%
394	Liban	35,25	33,00	-9.067457	-13.03	845,7	430,8	-49,1%	1133,3	371,7	-67,2%
395	Liban	36,00	34,00	-2.652106	-5.61	1196,6	1089,0	-9,0%	1266,7	1012,6	-20,1%
396	Liban	36,00	33,00	-4.246227	-9.47	578,6	394,4	-31,8%	725,4	370,0	-49,0%
397	Libye			-.4340914	-5.13	83,0	40,9	-50,7%	85,9	44,3	-48,4%
398	Libye	9,00	30,00	-.2474293	-2.86	50,0	31,7	-36,7%	51,5	32,5	-37,0%
399	Libye	9,00	29,00	-.2315309	-2.82	47,7	26,2	-45,1%	48,8	30,3	-37,9%
400	Libye	9,00	28,00	-.2004587	-2.86	42,5	24,5	-42,3%	42,9	27,9	-35,1%
401	Libye	9,00	27,00	-.1059865	-1.53	33,4	23,4	-29,8%	33,3	27,3	-17,9%
402	Libye	9,00	26,00	-.1369966	-1.95	31,3	20,8	-33,6%	31,7	22,2	-29,8%
403	Libye	9,00	25,00	-.1788212	-2.71	30,9	19,6	-36,5%	31,9	17,2	-46,1%
404	Libye	10,00	32,00	-.1269465	-0.90	101,9	99,6	-2,3%	103,8	83,4	-19,6%
405	Libye	10,00	31,00	-.2526346	-2.51	64,6	48,3	-25,2%	66,5	41,8	-37,1%
406	Libye	10,00	30,00	-.2796367	-3.11	54,5	33,6	-38,3%	56,4	34,2	-39,2%
407	Libye	10,00	29,00	-.2915578	-3.51	53,6	29,2	-45,5%	55,5	32,3	-41,7%
408	Libye	10,00	28,00	-.321251	-4.42	55,3	29,2	-47,2%	56,6	29,6	-47,7%
409	Libye	10,00	27,00	-.2472764	-4.03	43,5	23,3	-46,5%	44,4	24,9	-44,0%
410	Libye	10,00	26,00	-.1855787	-2.97	32,5	19,4	-40,4%	33,3	19,2	-42,5%
411	Libye	10,00	25,00	-.2188351	-3.24	30,8	17,9	-42,0%	32,1	14,0	-56,4%
412	Libye	10,00	24,00	-.2386137	-3.64	34,0	19,5	-42,7%	35,3	16,0	-54,7%
413	Libye	11,00	33,00	.1190575	0.74	122,4	134,4	9,8%	123,2	123,4	0,2%
414	Libye	11,00	32,00	-.1774395	-0.94	129,4	123,6	-4,4%	132,5	105,6	-20,3%
415	Libye	11,00	31,00	-.2810926	-2.18	81,4	64,2	-21,1%	83,9	53,3	-36,5%
416	Libye	11,00	30,00	-.4045334	-3.88	71,2	41,7	-41,4%	74,0	39,3	-46,9%
417	Libye	11,00	29,00	-.5106774	-5.11	71,7	32,9	-54,1%	74,8	32,5	-56,5%
418	Libye	11,00	28,00	-.5690863	-6.04	73,3	27,8	-62,1%	76,1	28,2	-62,9%
419	Libye	11,00	27,00	-.628963	-6.70	72,9	22,0	-69,8%	76,1	22,4	-70,6%
420	Libye	11,00	26,00	-.5686637	-6.90	63,2	18,2	-71,3%	66,2	17,5	-73,6%
421	Libye	11,00	25,00	-.3765091	-5.61	45,0	18,9	-58,1%	47,0	16,1	-65,7%
422	Libye	11,00	24,00	-.3154805	-4.49	38,8	18,2	-53,1%	40,4	15,4	-61,8%
423	Libye	11,00	23,00	-.3943898	-4.48	46,5	19,5	-58,0%	48,2	17,5	-63,8%
424	Libye	12,00	32,00	-.2277277	-1.17	172,1	162,0	-5,9%	175,5	138,9	-20,9%
425	Libye	12,00	31,00	-.3280419	-1.94	137,5	117,6	-14,5%	140,9	102,3	-27,4%
426	Libye	12,00	30,00	-.5530516	-4.17	89,7	50,0	-44,2%	93,7	45,1	-51,8%
427	Libye	12,00	29,00	-.6548874	-5.62	85,5	33,8	-60,5%	89,4	35,5	-60,3%
428	Libye	12,00	28,00	-.732983	-6.46	81,2	21,6	-73,4%	84,9	23,4	-72,5%
429	Libye	12,00	27,00	-.7807831	-7.01	80,9	18,0	-77,7%	84,9	17,9	-78,9%
430	Libye	12,00	26,00	-.764792	-7.11	76,9	16,0	-79,2%	80,8	14,9	-81,6%
431	Libye	12,00	25,00	-.7033991	-7.03	70,0	15,6	-77,7%	73,7	13,6	-81,5%
432	Libye	12,00	24,00	-.5624715	-6.82	57,0	15,8	-72,3%	59,8	13,6	-77,3%
433	Libye	12,00	23,00	-.480152	-5.31	50,1	16,6	-66,8%	52,1	14,4	-72,3%
434	Libye	13,00	32,00	-.4444176	-2.02	206,4	181,1	-12,3%	210,2	152,9	-27,3%
435	Libye	13,00	31,00	-.5271615	-3.08	120,2	85,0	-29,3%	124,5	73,7	-40,8%
436	Libye	13,00	30,00	-.5956223	-3.89	102,4	60,2	-41,2%	106,8	53,6	-49,8%
437	Libye	13,00	29,00	-.7266324	-5.86	93,5	31,7	-66,0%	97,8	37,8	-61,4%
438	Libye	13,00	28,00	-.843553	-6.83	84,1	15,3	-81,9%	88,4	18,6	-79,0%
439	Libye	13,00	27,00	-.8643101	-7.10	86,4	17,7	-79,6%	90,7	16,9	-81,4%
440	Libye	13,00	26,00	-.8656315	-7.14	83,0	14,6	-82,5%	87,4	13,6	-84,5%
441	Libye	13,00	25,00	-.8695033	-7.02	80,9	13,0	-83,9%	85,3	11,7	-86,3%
442	Libye	13,00	24,00	-.8117932	-6.94	74,3	12,7	-83,0%	78,3	10,9	-86,0%
443	Libye	13,00	23,00	-.5940358	-6.44	55,7	13,4	-76,0%	58,2	11,2	-80,7%
444	Libye	13,00	22,00	-.5837281	-6.44	56,6	15,5	-72,7%	58,7	13,8	-76,5%
445	Libye	14,00	32,00	-.484475	-2.48	136,0	101,3	-25,5%	140,5	88,3	-37,2%
446	Libye	14,00	31,00	-.5416199	-3.16	114,0	77,7	-31,8%	118,4	66,9	-43,5%
447	Libye	14,00	30,00	-.7086832	-4.63	108,7	56,9	-47,7%	113,4	55,5	-51,0%
448	Libye	14,00	29,00	-.8366472	-6.21	97,9	26,9	-72,6%	102,9	35,3	-65,7%
449	Libye	14,00	28,00	-.9108989	-6.93	89,0	13,1	-85,3%	93,8	18,2	-80,6%
450	Libye	14,00	27,00	-.9103234	-7.01	85,6	12,8	-85,1%	90,1	13,7	-84,8%
451	Libye	14,00	26,00	-.8793421	-6.99	83,5	13,6	-83,8%	87,9	13,6	-84,5%
452	Libye	14,00	25,00	-.8890381	-6.94	80,9	10,9	-86,5%	85,4	10,6	-87,6%
453	Libye	14,00	24,00	-.8555871	-6.91	76,5	10,8	-85,8%	80,6	9,6	-88,1%
454	Libye	14,00	23,00	-.665916	-7.03	59,9	11,7	-80,5%	62,6	9,6	-84,6%
455	Libye	14,00	22,00	-.6814874	-5.75	67,7	18,6	-72,5%	70,2	17,1	-75,6%
456	Libye	15,00	32,00	-.3676721	-1.75	217,9	198,4	-9,0%	220,4	182,1	-17,4%
457	Libye	15,00	31,00	-.4046567	-2.08	209,6	184,1	-12,1%	214,0	173,9	-18,7%
458	Libye	15,00	30,00	-.6974414	-4.49	118,0	68,6	-41,9%	123,4	66,6	-46,0%
459	Libye	15,00	29,00	-.8123019	-5.93	99,2	31,5	-68,3%	104,4	38,3	-63,3%
460	Libye	15,00	28,00	-.8839292	-6.77	91,6	16,9	-81,6%	96,6	22,9	-76,3%
461	Libye	15,00	27,00	-.9052535	-7.18	88,3	13,2	-85,0%	93,2	16,2	-82,6%
462	Libye	15,00	26,00	-.8711037	-6.90	82,0	11,7	-85,7%	86,4	13,7	-84,2%
463	Libye	15,00	25,00	-.8371791	-6.80	76,8	10,5	-86,4%	81,0	11,2	-86,2%
464	Libye	15,00	24,00	-.8906904	-6.74	79,3	10,7	-86,5%	83,5	10,2	-87,8%
465	Libye	15,00	23,00	-.7165842	-6.29	67,7	14,9	-78,0%	70,7	13,5	-80,8%
466	Libye	16,00	31,00	-.2947966	-1.39	209,2	189,2	-9,5%	215,7	188,2	-12,7%
467	Libye	16,00	30,00	-.6344732	-3.95	115,7	72,4	-37,4%	121,8	73,3	-39,8%
468	Libye	16,00	29,00	-.7418654	-5.64	93,9	35,1	-62,7%	99,1	41,5	-58,1%
469	Libye	16,00	28,00	-.7740589	-6.19	87,4	21,5	-75,4%	92,4	29,4	-68,2%
470	Libye	16,00	27,00	-.8065101	-6.62	85,0	16,5	-80,6%	89,7	22,4	-75,0%
471	Libye	16,00	26,00	-.8033231	-6.84	79,1	12,6	-84,0%	83,4	16,5	-80,2%
472	Libye	16,00	25,00	-.7747215	-6.63	73,1	11,6	-84,2%	77,0	13,3	-82,7%
473	Libye	16,00	24,00	-.8487267	-6.39	78,6	13,3	-83,1%	82,6	13,2	-84,1%
474	Libye	16,00	23,00	-.7289139	-5.40	71,4	17,4	-75,6%	74,4	16,4	-77,9%
475	Libye	17,00	31,00	-.0380678	-0.16	183,8	173,1	-5,8%	191,8	187,3	-2,3%

476	Libye	17,00	30,00	-.4095302	-2.38	115,3	85,5	-25,8%	121,6	92,6	-23,9%
477	Libye	17,00	29,00	-.6090084	-4.62	83,8	35,9	-57,1%	88,7	44,6	-49,8%
478	Libye	17,00	28,00	-.6577407	-5.39	81,0	24,1	-70,2%	85,6	33,9	-60,4%
479	Libye	17,00	27,00	-.7220091	-6.03	80,4	18,2	-77,4%	85,0	26,2	-69,2%
480	Libye	17,00	26,00	-.7499453	-6.57	77,6	14,1	-81,8%	81,9	19,5	-76,2%
481	Libye	17,00	25,00	-.7247113	-6.57	71,9	13,1	-81,8%	75,7	16,0	-78,9%
482	Libye	17,00	24,00	-.7793346	-5.96	75,9	16,0	-78,9%	79,6	17,0	-78,6%
483	Libye	17,00	23,00	-.7570883	-4.81	74,6	18,0	-75,9%	77,8	18,3	-76,5%
484	Libye	17,00	22,00	-.9322583	-4.36	86,9	17,2	-80,1%	90,7	17,1	-81,2%
485	Libye	18,00	30,00	-.2693893	-1.51	112,0	88,5	-21,0%	118,1	98,1	-16,9%
486	Libye	18,00	29,00	-.4888212	-3.65	79,6	40,2	-49,4%	84,2	48,5	-42,4%
487	Libye	18,00	28,00	-.5893161	-4.87	78,7	26,8	-65,9%	83,2	37,2	-55,3%
488	Libye	18,00	27,00	-.6502131	-5.80	76,7	19,3	-74,8%	81,1	27,9	-65,6%
489	Libye	18,00	26,00	-.7010861	-6.51	75,5	14,4	-80,9%	79,7	20,0	-74,9%
490	Libye	18,00	25,00	-.6689426	-6.86	70,4	13,7	-80,5%	74,0	17,7	-76,1%
491	Libye	18,00	24,00	-.6373107	-6.12	67,7	17,6	-74,0%	70,8	20,4	-71,2%
492	Libye	18,00	23,00	-.7245584	-4.60	73,7	18,6	-74,8%	76,8	20,8	-72,9%
493	Libye	18,00	22,00	-.9735502	-4.05	89,3	16,2	-81,9%	93,5	17,7	-81,1%
494	Libye	19,00	30,00	-.2005505	-1.20	110,6	88,6	-19,9%	116,3	101,7	-12,5%
495	Libye	19,00	29,00	-.403034	-3.05	81,8	48,1	-41,1%	86,2	57,5	-33,3%
496	Libye	19,00	28,00	-.4948994	-4.32	77,8	33,9	-56,4%	82,1	43,7	-46,8%
497	Libye	19,00	27,00	-.5529636	-5.46	71,2	20,3	-71,6%	75,2	29,1	-61,3%
498	Libye	19,00	26,00	-.587332	-6.33	67,1	14,3	-78,8%	70,9	20,8	-70,6%
499	Libye	19,00	25,00	-.597105	-6.78	66,7	14,2	-78,7%	70,1	19,7	-71,8%
500	Libye	19,00	24,00	-.5372431	-6.20	60,9	16,6	-72,8%	63,7	21,7	-65,8%
501	Libye	19,00	23,00	-.6272347	-4.74	67,5	18,7	-72,3%	70,3	23,0	-67,2%
502	Libye	19,00	22,00	-.9201112	-3.95	89,0	18,9	-78,8%	93,0	22,4	-76,0%
503	Libye	19,00	21,00	-1.034317	-3.71	105,4	24,6	-76,7%	109,6	29,4	-73,2%
504	Libye	20,00	30,00	-.0570309	-0.32	148,3	134,4	-9,4%	154,2	148,4	-3,7%
505	Libye	20,00	29,00	-.3403781	-2.54	88,2	59,0	-33,1%	92,5	69,7	-24,7%
506	Libye	20,00	28,00	-.439596	-3.84	78,6	41,3	-47,5%	82,7	49,3	-40,3%
507	Libye	20,00	27,00	-.4873589	-4.92	66,8	22,4	-66,5%	70,4	29,9	-57,5%
508	Libye	20,00	26,00	-.5207543	-5.68	57,6	11,4	-80,2%	60,7	17,6	-71,1%
509	Libye	20,00	25,00	-.5167844	-5.73	53,7	8,6	-84,0%	56,5	14,7	-73,9%
510	Libye	20,00	24,00	-.481644	-5.20	51,4	10,9	-78,9%	53,9	17,4	-67,7%
511	Libye	20,00	23,00	-.4870142	-4.99	51,4	13,0	-74,7%	53,7	18,3	-65,9%
512	Libye	20,00	22,00	-.9168881	-3.86	91,0	19,7	-78,3%	95,0	24,6	-74,1%
513	Libye	20,00	21,00	-1.083397	-3.58	115,1	28,2	-75,5%	118,6	34,4	-71,0%
514	Libye	21,00	32,00	.0240293	0.11	266,8	261,9	-1,8%	272,0	277,8	2,1%
515	Libye	21,00	31,00	.0105338	0.05	177,9	168,0	-5,5%	183,0	182,8	-0,1%
516	Libye	21,00	30,00	-.1341813	-0.77	134,6	116,7	-13,3%	139,4	129,1	-7,3%
517	Libye	21,00	29,00	-.3837772	-2.80	79,4	46,0	-42,0%	83,1	60,1	-27,6%
518	Libye	21,00	28,00	-.415335	-3.60	70,3	33,5	-52,3%	73,7	43,1	-41,5%
519	Libye	21,00	27,00	-.4528681	-4.38	59,3	19,0	-68,0%	62,3	26,1	-58,1%
520	Libye	21,00	26,00	-.4924706	-5.03	51,5	9,7	-81,2%	54,2	14,1	-73,9%
521	Libye	21,00	25,00	-.4725169	-4.90	48,9	9,6	-80,5%	51,3	14,3	-72,2%
522	Libye	21,00	24,00	-.4524011	-4.47	47,6	10,3	-78,4%	49,9	16,4	-67,2%
523	Libye	21,00	23,00	-.4500371	-4.47	45,5	9,6	-78,9%	47,6	15,6	-67,2%
524	Libye	21,00	22,00	-.7148828	-4.39	76,5	18,5	-75,8%	78,3	24,3	-68,9%
525	Libye	21,00	21,00	-1.118487	-3.49	129,0	36,1	-72,0%	130,4	43,5	-66,6%
526	Libye	21,00	20,00	-1.012491	-3.22	137,7	51,8	-62,3%	138,1	60,3	-56,3%
527	Libye	22,00	32,00	-.1307868	-0.61	207,5	199,5	-3,9%	212,2	201,9	-4,8%
528	Libye	22,00	31,00	-.1751182	-0.93	159,5	142,7	-10,5%	164,0	152,3	-7,2%
529	Libye	22,00	30,00	-.307118	-2.11	84,2	54,8	-34,9%	87,6	72,2	-17,5%
530	Libye	22,00	29,00	-.4048744	-3.23	61,7	25,0	-59,5%	64,7	43,8	-32,2%
531	Libye	22,00	28,00	-.4180419	-3.70	58,2	19,7	-66,2%	60,9	31,6	-48,1%
532	Libye	22,00	27,00	-.4552859	-4.41	52,8	12,8	-75,8%	55,1	19,9	-63,8%
533	Libye	22,00	26,00	-.4627254	-4.86	46,3	7,7	-83,3%	48,2	11,9	-75,4%
534	Libye	22,00	25,00	-.4351135	-4.65	44,4	9,0	-79,8%	46,2	13,0	-71,8%
535	Libye	22,00	24,00	-.4449717	-4.57	43,2	6,4	-85,1%	45,0	12,3	-72,6%
536	Libye	22,00	23,00	-.4464128	-4.39	43,6	7,7	-82,4%	45,5	13,6	-70,2%
537	Libye	22,00	22,00	-.4572051	-4.84	57,4	17,0	-70,4%	56,0	22,6	-59,6%
538	Libye	22,00	21,00	-.7152711	-3.60	105,4	40,0	-62,1%	102,7	47,9	-53,4%
539	Libye	22,00	20,00	-.8203234	-3.14	140,0	67,8	-51,6%	138,6	76,0	-45,2%
540	Libye	23,00	32,00	-.2435168	-1.20	194,2	176,4	-9,2%	198,2	184,3	-7,0%
541	Libye	23,00	31,00	-.2700936	-1.67	113,0	90,7	-19,8%	116,7	100,8	-13,6%
542	Libye	23,00	30,00	-.3321397	-2.66	62,9	33,2	-47,2%	65,6	48,1	-26,7%
543	Libye	23,00	29,00	-.3855704	-3.36	55,2	20,8	-62,4%	57,6	36,6	-36,4%
544	Libye	23,00	28,00	-.4059068	-3.92	50,6	15,1	-70,2%	52,8	25,6	-51,5%
545	Libye	23,00	27,00	-.425524	-4.55	44,4	8,3	-81,2%	46,1	14,8	-67,9%
546	Libye	23,00	26,00	-.4218451	-4.82	41,0	6,7	-83,7%	42,4	10,3	-75,7%
547	Libye	23,00	25,00	-.4044621	-4.77	39,6	6,8	-82,8%	40,9	10,5	-74,4%
548	Libye	23,00	24,00	-.4132184	-4.76	38,6	4,5	-88,4%	40,1	9,6	-75,9%
549	Libye	23,00	23,00	-.3943156	-4.34	36,7	4,6	-87,5%	38,3	10,0	-73,9%
550	Libye	23,00	22,00	-.3554583	-4.31	46,1	12,9	-72,0%	44,2	18,5	-58,3%
551	Libye	23,00	21,00	-.4501705	-3.15	84,3	37,9	-55,0%	80,4	45,3	-43,7%
552	Libye	23,00	20,00	-.4929311	-2.66	124,1	76,4	-38,4%	120,8	84,0	-30,4%
553	Libye	23,00	19,00	-.6260467	-3.02	137,4	82,8	-39,7%	134,3	90,1	-32,9%
554	Libye	24,00	32,00	-.3526318	-1.92	137,3	102,1	-25,6%	141,7	120,0	-15,3%
555	Libye	24,00	31,00	-.3269567	-2.17	104,8	76,6	-26,9%	108,1	88,6	-18,0%
556	Libye	24,00	30,00	-.3212761	-2.76	57,9	28,9	-50,1%	60,1	42,6	-29,2%
557	Libye	24,00	29,00	-.345323	-3.26	49,9	18,4	-63,0%	51,8	32,3	-37,7%
558	Libye	24,00	28,00	-.3735455	-3.92	45,4	13,3	-70,7%	47,1	22,2	-52,8%
559	Libye	24,00	27,00	-.3934899	-4.56	40,2	7,2	-82,0%	41,6	13,1	-68,6%
560	Libye	24,00	26,00	-.3971022	-5.01	37,2	4,7	-87,3%	38,5	8,4	-78,1%
561	Libye	24,00	25,00	-.3817505	-5.07	34,7	3,1	-91,0%	36,1	7,0	-80,5%
562	Libye	24,00	24,00	-.376561	-4.80	34,7	3,2	-90,7%	36,3	7,8	-78,6%
563	Libye	24,00	23,00	-.2838412	-3.96	27,8	3,8	-86,3%	29,2	9,3	-68,2%
564	Libye	24,00	22,00	-.156928	-2.79	25,8	8,7	-66,3%	24,5	15,0	-38,7%
565	Libye	24,00	21,00	-.3557214	-2.73	69,7	30,8	-55,9%	65,3	38,7	-40,7%
566	Libye	24,00	20,00	-.4323733	-2.42	117,6	73,8	-37,2%	113,9	83,7	-26,5%
567	Libye	25,00	31,00	-.2819424	-1.92	111,8	86,7	-22,4%	114,4	97,2	-15,1%
568	Libye	25,00	30,00	-.2493152	-2.20	50,5	24,7	-51,1%	52,4	40,7	-22,3%

569	Maroc			-.5543978	-4.52	201,6	166,4	-17,5%	215,4	166,9	-22,5%
570	Maroc	-17,00	22,00	-.5521657	-4.62	47,8	23,2	-51,4%	70,4	31,3	-55,5%
571	Maroc	-17,00	21,00	-.589583	-4.61	45,9	20,4	-55,7%	71,1	28,8	-59,5%
572	Maroc	-16,00	23,00	-.5910231	-4.41	51,9	25,1	-51,7%	75,9	31,4	-58,6%
573	Maroc	-16,00	22,00	-.5318098	-4.59	47,6	23,3	-51,1%	69,0	31,9	-53,7%
574	Maroc	-16,00	21,00	-.5637642	-4.47	53,3	26,4	-50,5%	75,4	36,3	-51,9%
575	Maroc	-15,00	25,00	-.8304226	-4.66	70,8	33,4	-52,9%	102,1	33,6	-67,1%
576	Maroc	-15,00	24,00	-.6791345	-4.26	61,5	32,3	-47,5%	90,1	33,8	-62,5%
577	Maroc	-15,00	23,00	-.527446	-4.64	53,6	29,9	-44,2%	74,6	33,7	-54,8%
578	Maroc	-15,00	22,00	-.5039811	-4.74	54,3	27,8	-48,8%	70,9	34,6	-51,2%
579	Maroc	-15,00	21,00	-.5431684	-4.12	87,4	52,9	-39,5%	101,7	64,1	-37,0%
580	Maroc	-14,00	27,00	-.8975025	-3.24	224,3	167,8	-25,2%	238,3	164,5	-31,0%
581	Maroc	-14,00	26,00	-1.004607	-4.05	156,5	98,4	-37,1%	178,6	98,4	-44,9%
582	Maroc	-14,00	25,00	-.9616495	-4.88	80,1	35,1	-56,2%	115,4	38,9	-66,3%
583	Maroc	-14,00	24,00	-.6451487	-4.24	66,4	37,9	-42,9%	94,4	40,5	-57,1%
584	Maroc	-14,00	23,00	-.480897	-4.28	65,0	41,2	-36,6%	83,4	45,6	-45,3%
585	Maroc	-14,00	22,00	-.4797155	-3.81	88,6	59,1	-33,3%	102,1	66,6	-34,7%
586	Maroc	-14,00	21,00	-.5526318	-3.61	107,3	69,2	-35,5%	119,6	80,5	-32,7%
587	Maroc	-13,00	28,00	-.9128904	-4.06	128,9	76,2	-40,9%	149,1	75,8	-49,2%
588	Maroc	-13,00	27,00	-.9567807	-4.23	124,4	71,3	-42,7%	148,4	72,1	-51,4%
589	Maroc	-13,00	26,00	-1.027375	-4.61	97,4	45,5	-53,3%	129,1	49,8	-61,4%
590	Maroc	-13,00	25,00	-.8916495	-4.68	82,5	40,3	-51,1%	117,4	45,3	-61,4%
591	Maroc	-13,00	24,00	-.6383375	-4.24	75,2	45,4	-39,7%	102,3	49,8	-51,3%
592	Maroc	-13,00	23,00	-.4879603	-3.74	72,6	48,8	-32,8%	91,9	53,3	-41,9%
593	Maroc	-12,00	28,00	-.7477833	-4.71	107,8	69,4	-35,7%	131,1	65,3	-50,2%
594	Maroc	-12,00	27,00	-.8409712	-4.99	91,6	50,8	-44,5%	120,3	50,9	-57,7%
595	Maroc	-12,00	26,00	-.8763164	-4.78	84,8	42,3	-50,1%	116,6	46,2	-60,4%
596	Maroc	-11,00	29,00	-.4727995	-2.95	127,1	98,3	-22,7%	140,2	84,8	-39,5%
597	Maroc	-11,00	28,00	-.555639	-4.26	94,1	66,6	-29,3%	115,3	59,4	-48,5%
598	Maroc	-11,00	27,00	-.6669215	-5.32	77,8	48,0	-38,3%	105,6	47,6	-54,9%
599	Maroc	-11,00	26,00	-.7259911	-4.91	72,4	39,0	-46,2%	102,7	42,5	-58,6%
600	Maroc	-10,00	30,00	-.2307775	-1.17	126,2	112,7	-10,7%	138,9	99,2	-28,6%
601	Maroc	-10,00	29,00	-.3207673	-1.74	121,6	103,0	-15,3%	135,1	88,8	-34,3%
602	Maroc	-10,00	28,00	-.5264721	-3.77	98,0	70,8	-27,7%	118,0	64,0	-45,8%
603	Maroc	-10,00	27,00	-.6522343	-5.65	75,6	45,5	-39,7%	102,4	45,9	-55,2%
604	Maroc	-10,00	26,00	-.6673543	-5.51	68,2	37,9	-44,5%	96,2	41,2	-57,2%
605	Maroc	-9,00	33,00	-.3410658	-0.91	383,7	351,6	-8,4%	392,3	361,0	-8,0%
606	Maroc	-9,00	32,00	-.3914781	-1.42	310,6	280,4	-9,7%	315,8	280,2	-11,3%
607	Maroc	-9,00	31,00	-.4649337	-1.72	445,8	409,9	-8,1%	443,9	386,1	-13,0%
608	Maroc	-9,00	30,00	-.3116996	-1.33	222,3	204,5	-8,0%	234,0	178,4	-23,8%
609	Maroc	-9,00	29,00	-.4101891	-2.37	120,5	99,2	-17,7%	138,8	90,1	-35,0%
610	Maroc	-9,00	28,00	-.6480298	-4.50	92,5	58,4	-36,9%	116,8	56,1	-52,0%
611	Maroc	-9,00	27,00	-.7466917	-5.80	76,4	40,5	-47,0%	105,9	42,5	-59,9%
612	Maroc	-9,00	26,00	-.7383431	-6.06	70,1	35,8	-48,9%	100,0	39,4	-60,6%
613	Maroc	-8,00	33,00	-.2978992	-1.04	343,6	313,9	-8,6%	338,6	313,5	-7,4%
614	Maroc	-8,00	32,00	-.7205236	-2.74	282,4	240,8	-14,7%	307,4	236,7	-23,0%
615	Maroc	-8,00	31,00	-.4263914	-1.97	362,2	331,4	-8,5%	372,5	325,0	-12,7%
616	Maroc	-8,00	30,00	-.5144509	-2.56	160,8	134,1	-16,6%	181,3	128,6	-29,0%
617	Maroc	-8,00	29,00	-.6171022	-3.95	109,0	77,8	-28,6%	134,3	76,0	-43,4%
618	Maroc	-7,00	34,00	-.0653044	-0.16	409,2	387,1	-5,4%	387,3	392,6	1,4%
619	Maroc	-7,00	33,00	-.3642962	-1.18	397,9	363,9	-8,5%	391,3	361,3	-7,7%
620	Maroc	-7,00	32,00	-.338407	-1.10	468,1	426,6	-8,9%	466,9	421,4	-9,7%
621	Maroc	-7,00	31,00	-.1891298	-0.97	263,8	248,6	-5,7%	276,2	250,5	-9,3%
622	Maroc	-7,00	30,00	-.459608	-2.35	193,9	168,3	-13,2%	215,9	167,6	-22,3%
623	Maroc	-7,00	29,00	-.7009851	-4.17	112,9	78,7	-30,2%	145,2	81,3	-44,0%
624	Maroc	-6,00	35,00	-.2929441	-0.68	626,6	587,2	-6,3%	610,9	607,1	-0,6%
625	Maroc	-6,00	34,00	-.2488333	-0.62	516,3	488,4	-5,4%	495,3	477,9	-3,5%
626	Maroc	-6,00	33,00	-.4486554	-1.33	455,6	398,2	-12,6%	436,7	390,9	-10,5%
627	Maroc	-6,00	32,00	-.2129663	-0.65	445,9	415,7	-6,8%	450,1	423,0	-6,0%
628	Maroc	-6,00	31,00	-.5051107	-2.68	156,4	126,7	-19,0%	186,3	129,4	-30,5%
629	Maroc	-6,00	30,00	-.5466175	-2.88	147,2	118,3	-19,6%	178,7	119,7	-33,0%
630	Maroc	-6,00	29,00	-.7166732	-3.90	123,9	88,9	-28,2%	160,9	91,7	-43,0%
631	Maroc	-5,00	35,00	-.9052321	-2.00	1012,4	927,9	-8,3%	995,5	922,6	-7,3%
632	Maroc	-5,00	34,00	-1.016474	-2.84	637,8	563,6	-11,6%	636,1	533,8	-16,1%
633	Maroc	-5,00	33,00	-.5672495	-2.17	395,1	341,9	-13,5%	390,5	335,0	-14,2%
634	Maroc	-5,00	32,00	-.424336	-2.03	196,7	151,7	-22,9%	199,7	151,9	-24,0%
635	Maroc	-5,00	31,00	-.4045668	-2.65	123,8	92,4	-25,4%	139,5	92,9	-33,4%
636	Maroc	-5,00	30,00	-.3625512	-2.59	99,4	78,6	-20,9%	119,4	79,9	-33,1%
637	Maroc	-4,00	35,00	-.7940608	-2.06	598,5	512,3	-14,4%	580,6	528,8	-8,9%
638	Maroc	-4,00	34,00	-.8907618	-2.84	537,7	460,8	-14,3%	532,6	449,1	-15,7%
639	Maroc	-4,00	33,00	-.7881466	-3.60	230,1	168,9	-26,6%	239,6	168,7	-29,6%
640	Maroc	-4,00	32,00	-.2797674	-1.95	131,9	109,0	-17,4%	140,1	115,4	-17,7%
641	Maroc	-4,00	31,00	-.2195265	-2.19	77,9	63,6	-18,4%	86,5	65,9	-23,8%
642	Maroc	-4,00	30,00	-.20062	-2.23	65,6	53,8	-18,1%	74,8	56,5	-24,5%
643	Maroc	-3,00	35,00	-.492782	-1.57	347,5	283,3	-18,5%	330,0	310,9	-5,8%
644	Maroc	-3,00	34,00	-.706713	-2.57	286,0	220,7	-22,9%	282,3	218,6	-22,6%
645	Maroc	-3,00	33,00	-.4997952	-2.85	353,9	314,4	-11,2%	356,2	314,5	-11,7%
646	Maroc	-3,00	32,00	-.2013678	-1.53	156,1	144,5	-7,4%	161,0	148,6	-7,7%
647	Maroc	-3,00	31,00	-.2086118	-1.98	73,1	62,4	-14,6%	81,1	66,3	-18,3%
648	Maroc	-2,00	34,00	-.6368102	-2.43	315,7	250,2	-20,8%	301,6	252,5	-16,3%
649	Maroc	-2,00	33,00	-.3214716	-1.95	206,6	189,2	-8,4%	215,4	197,0	-8,5%
650	Maroc	-2,00	32,00	-.133375	-0.88	100,1	95,6	-4,5%	106,3	102,5	-3,6%

651	Syrie			-2.292824	-8.72	501,7	337,3	-32,8%	479,3	272,0	-43,2%
652	Syrie	35,00	32,00	-1.732267	-4.26	581,4	432,3	-25,7%	549,2	402,1	-26,8%
653	Syrie	35,25	34,00	-5.820722	-11.19	1042,1	648,3	-37,8%	1014,6	517,7	-49,0%
654	Syrie	35,25	33,00	-9.067457	-13.03	1156,0	546,9	-52,7%	1133,3	371,7	-67,2%
655	Syrie	36,00	34,00	-2.652106	-5.61	1286,2	1115,7	-13,3%	1266,7	1012,6	-20,1%
656	Syrie	36,00	33,00	-4.246227	-9.47	763,6	433,6	-43,2%	725,4	370,0	-49,0%
657	Syrie	36,00	32,00	-1.576681	-4.53	444,2	283,9	-36,1%	403,0	265,4	-34,1%
658	Syrie	36,25	36,00	-2.089469	-4.77	939,7	816,8	-13,1%	926,0	729,0	-21,3%
659	Syrie	36,25	35,00	-4.804696	-8.07	1173,0	962,3	-18,0%	1157,0	696,6	-39,8%
660	Syrie	37,00	36,00	-2.228561	-5.92	568,0	444,3	-21,8%	556,0	346,1	-37,8%
661	Syrie	37,00	35,00	-2.49238	-6.11	646,6	495,9	-23,3%	628,2	407,0	-35,2%
662	Syrie	37,00	34,00	-2.38074	-7.65	383,9	210,3	-45,2%	361,0	149,3	-58,7%
663	Syrie	37,00	33,00	-2.597972	-7.87	497,7	277,6	-44,2%	460,7	231,7	-49,7%
664	Syrie	37,00	32,00	-2.2336	-8.97	277,8	90,5	-67,4%	240,2	57,0	-76,3%
665	Syrie	38,00	36,00	-2.251816	-7.48	375,4	242,5	-35,4%	364,4	164,7	-54,8%
666	Syrie	38,00	35,00	-2.245597	-8.03	329,3	179,3	-45,5%	314,4	128,3	-59,2%
667	Syrie	38,00	34,00	-2.55908	-9.07	362,8	170,8	-52,9%	336,9	117,0	-65,3%
668	Syrie	38,00	33,00	-2.411903	-8.76	359,7	152,1	-57,7%	325,6	124,3	-61,8%
669	Syrie	38,00	32,00	-2.335241	-9.07	328,0	128,1	-60,9%	289,7	95,9	-66,9%
670	Syrie	39,00	36,00	-1.848827	-6.72	318,8	193,5	-39,3%	302,6	131,9	-56,4%
671	Syrie	39,00	35,00	-1.857198	-7.43	295,5	147,4	-50,1%	277,2	118,0	-57,4%
672	Syrie	39,00	34,00	-2.26158	-9.11	320,2	131,9	-58,8%	294,1	96,1	-67,3%
673	Syrie	39,00	33,00	-2.165835	-8.47	319,2	116,7	-63,4%	286,1	101,7	-64,5%
674	Syrie	40,00	37,00	-.5243277	-1.38	502,1	461,3	-8,1%	487,7	402,1	-17,6%
675	Syrie	40,00	36,00	-1.414186	-5.35	293,6	195,6	-33,4%	273,9	131,9	-51,8%
676	Syrie	40,00	35,00	-1.598902	-7.20	268,9	139,9	-48,0%	248,1	100,8	-59,4%
677	Syrie	40,00	34,00	-1.771288	-8.24	274,0	120,8	-55,9%	250,0	90,8	-63,7%
678	Syrie	40,00	33,00	-1.695339	-7.75	283,4	124,1	-56,2%	256,4	106,5	-58,5%
679	Syrie	41,00	37,00	-.5834	-1.39	534,7	513,1	-4,0%	525,6	423,7	-19,4%
680	Syrie	41,00	36,00	-.6331072	-2.44	291,0	250,0	-14,1%	277,8	201,5	-27,5%
681	Syrie	41,00	35,00	-.9691975	-4.65	218,5	141,5	-35,2%	203,0	104,7	-48,4%
682	Syrie	41,00	34,00	-1.24371	-6.39	222,7	119,0	-46,6%	203,2	84,8	-58,3%
683	Syrie	42,00	37,00	-.7682041	-2.05	499,5	471,7	-5,6%	488,6	384,8	-21,2%
684	Syrie	42,00	36,00	-.6015643	-2.06	399,7	372,2	-6,9%	389,7	310,5	-20,3%
685	Tunisie			-.0319295	-0.22	240,7	241,0	0,1%	242,1	241,8	-0,1%
686	Tunisie	7,00	34,00	-.0995867	-0.94	73,4	71,9	-2,0%	78,3	77,8	-0,6%
687	Tunisie	7,00	33,00	-.1316597	-1.27	69,2	67,1	-2,9%	75,2	70,7	-5,9%
688	Tunisie	8,00	37,00	-.2708072	-0.66	671,0	678,1	1,1%	694,9	671,4	-3,4%
689	Tunisie	8,00	36,00	-.3500519	-1.28	414,3	400,7	-3,3%	426,2	406,7	-4,6%
690	Tunisie	8,00	35,00	-.0160263	-0.09	258,0	255,7	-0,9%	256,9	266,3	3,7%
691	Tunisie	8,00	34,00	-.0629868	-0.49	101,8	97,9	-3,8%	102,3	104,0	1,7%
692	Tunisie	8,00	33,00	-.0693059	-0.61	80,4	78,7	-2,1%	82,2	81,2	-1,3%
693	Tunisie	8,00	32,00	-.1722899	-2.00	61,8	56,0	-9,5%	66,8	54,0	-19,1%
694	Tunisie	9,00	37,00	-.8537031	-1.03	1567,6	1521,0	-3,0%	1590,2	1498,6	-5,8%
695	Tunisie	9,00	36,00	-.3528969	-1.17	460,5	431,3	-6,3%	458,8	443,9	-3,3%
696	Tunisie	9,00	35,00	.0862144	0.45	187,3	189,5	1,2%	180,7	201,8	11,7%
697	Tunisie	9,00	34,00	.0709137	0.46	104,5	110,6	5,8%	105,5	116,7	10,6%
698	Tunisie	9,00	33,00	.0481392	0.36	107,0	112,3	5,0%	104,4	107,8	3,2%
699	Tunisie	9,00	32,00	-.1934659	-1.74	77,9	72,0	-7,6%	80,8	57,6	-28,7%
700	Tunisie	9,00	31,00	-.2524233	-2.82	47,8	38,9	-18,6%	57,2	34,5	-39,7%
701	Tunisie	9,00	30,00	-.2474293	-2.86	39,9	31,5	-21,2%	51,5	32,5	-37,0%
702	Tunisie	10,00	37,00	.3618405	1.05	449,6	456,6	1,6%	428,6	465,1	8,5%
703	Tunisie	10,00	36,00	.0519563	0.18	337,6	335,3	-0,7%	334,2	351,9	5,3%
704	Tunisie	10,00	35,00	.2092558	1.07	191,5	199,4	4,1%	184,8	213,0	15,3%
705	Tunisie	10,00	34,00	.2761801	1.41	180,2	195,9	8,7%	171,4	196,0	14,3%
706	Tunisie	10,00	33,00	.1690307	1.09	132,9	147,8	11,2%	126,9	134,9	6,3%
707	Tunisie	10,00	32,00	-.1269465	-0.90	99,8	100,9	1,0%	103,8	83,4	-19,6%
708	Tunisie	10,00	31,00	-.2526346	-2.51	55,7	48,0	-13,7%	66,5	41,8	-37,1%
709	Tunisie	10,00	30,00	-.2796367	-3.11	43,2	33,0	-23,8%	56,4	34,2	-39,2%
710	Tunisie	11,00	37,00	.5337827	1.59	448,0	462,8	3,3%	424,3	495,2	16,7%
711	Tunisie	11,00	36,00	.3567029	1.25	309,0	324,8	5,1%	301,9	346,5	14,7%
712	Tunisie	11,00	35,00	.4267918	1.51	208,3	230,7	10,7%	201,1	228,7	13,7%
713	Tunisie	11,00	34,00	.2415393	1.00	193,0	216,7	12,3%	194,9	207,8	6,6%
714	Tunisie	11,00	33,00	.1190575	0.74	125,4	140,4	12,0%	123,2	123,4	0,2%
715	Tunisie	11,00	32,00	-.1774395	-0.94	124,8	125,8	0,8%	132,5	105,6	-20,3%

716	Turquie			-.4037932	-2.11	598,4	574,0	-4,1%	606,0	570,9	-5,8%
717	Turquie	25,00	40,00	.0596006	0.21	606,4	673,3	11,0%	620,7	635,1	2,3%
718	Turquie	26,00	41,00	-.1402743	-0.48	638,4	675,8	5,9%	650,7	644,2	-1,0%
719	Turquie	27,00	42,00	-.1869781	-0.53	595,6	622,1	4,4%	603,8	602,3	-0,2%
720	Turquie	27,00	41,00	-.2172209	-0.76	639,9	635,0	-0,8%	641,0	619,0	-3,4%
721	Turquie	27,00	40,00	-.2907422	-0.87	653,2	648,4	-0,7%	652,9	617,0	-5,5%
722	Turquie	27,00	39,00	-.4699073	-1.22	644,9	618,5	-4,1%	638,5	592,0	-7,3%
723	Turquie	27,00	38,00	-2.163219	-4.72	832,1	642,0	-22,9%	844,6	633,8	-25,0%
724	Turquie	28,00	41,00	-.1219915	-0.40	571,4	557,3	-2,5%	569,0	561,7	-1,3%
725	Turquie	28,00	40,00	-.2401075	-0.75	618,4	589,9	-4,6%	603,6	574,7	-4,8%
726	Turquie	28,00	39,00	-.1601019	-0.41	623,8	614,2	-1,5%	606,0	588,0	-3,0%
727	Turquie	28,00	38,00	-.08656	-0.20	664,6	653,7	-1,6%	638,5	630,8	-1,2%
728	Turquie	28,00	37,00	-1.160704	-2.25	788,5	697,4	-11,6%	772,3	674,4	-12,7%
729	Turquie	29,00	41,00	.0454452	0.13	763,5	738,3	-3,3%	763,3	760,1	-0,4%
730	Turquie	29,00	40,00	-.2209101	-0.77	680,9	669,2	-1,7%	669,8	655,9	-2,1%
731	Turquie	29,00	39,00	.0073672	0.02	652,7	651,4	-0,2%	633,5	637,6	0,6%
732	Turquie	29,00	38,00	-.3601603	-0.85	567,7	533,4	-6,1%	541,0	514,0	-5,0%
733	Turquie	29,00	37,00	-1.244741	-2.06	1065,4	943,8	-11,4%	1044,2	926,7	-11,2%
734	Turquie	30,00	41,00	.1262784	0.48	513,3	525,1	2,3%	501,8	519,5	3,5%
735	Turquie	30,00	40,00	.0473895	0.20	529,3	527,5	-0,3%	514,6	520,7	1,2%
736	Turquie	30,00	39,00	.0955259	0.37	538,4	541,9	0,7%	521,2	539,8	3,6%
737	Turquie	30,00	38,00	-.2006282	-0.59	515,3	500,4	-2,9%	496,5	489,3	-1,4%
738	Turquie	30,00	37,00	-.2789983	-0.59	589,2	593,4	0,7%	578,7	565,7	-2,2%
739	Turquie	30,00	36,00	-.550202	-0.94	871,2	858,4	-1,5%	872,2	820,6	-5,9%
740	Turquie	31,00	41,00	.1021972	0.36	822,4	841,4	2,3%	825,2	842,7	2,1%
741	Turquie	31,00	40,00	.2017088	0.99	380,1	395,8	4,1%	375,2	386,9	3,1%
742	Turquie	31,00	39,00	-.0573255	-0.23	414,9	413,9	-0,2%	404,0	411,1	1,7%
743	Turquie	31,00	38,00	-.6470085	-1.66	553,5	499,8	-9,7%	542,6	492,4	-9,3%
744	Turquie	31,00	37,00	-.1761449	-0.32	799,1	858,8	7,5%	809,7	819,6	1,2%
745	Turquie	32,00	41,00	-.173085	-0.56	583,7	575,7	-1,4%	602,2	587,0	-2,5%
746	Turquie	32,00	40,00	-.0697618	-0.36	378,4	383,0	1,2%	384,0	384,9	0,2%
747	Turquie	32,00	39,00	-.1127541	-0.52	438,7	433,4	-1,2%	434,1	430,0	-0,9%
748	Turquie	32,00	38,00	-.4087322	-1.43	492,3	478,9	-2,7%	499,1	471,4	-5,6%
749	Turquie	32,00	37,00	-1.785303	-3.15	1200,1	1193,1	-0,6%	1266,8	1160,5	-8,4%
750	Turquie	33,00	42,00	-.2442888	-0.65	944,8	962,7	1,9%	973,5	961,4	-1,2%
751	Turquie	33,00	41,00	-.4683218	-1.49	601,6	599,4	-0,4%	640,3	601,8	-6,0%
752	Turquie	33,00	40,00	-.2291984	-1.14	380,7	381,9	0,3%	401,8	383,8	-4,5%
753	Turquie	33,00	39,00	-.1194838	-0.60	370,2	365,8	-1,2%	375,0	367,9	-1,9%
754	Turquie	33,00	38,00	-.3261616	-1.38	332,8	317,6	-4,6%	345,3	312,7	-9,4%
755	Turquie	33,00	37,00	-.9215912	-2.63	654,2	593,7	-9,2%	676,4	584,5	-13,6%
756	Turquie	33,00	36,00	-1.109581	-2.86	967,4	866,7	-10,4%	986,4	863,4	-12,5%
757	Turquie	34,00	42,00	-.0802326	-0.20	877,3	902,2	2,8%	904,1	914,4	1,1%
758	Turquie	34,00	41,00	-.8388629	-2.79	457,9	438,1	-4,3%	515,0	444,8	-13,6%
759	Turquie	34,00	40,00	-.5908182	-2.75	424,1	403,9	-4,8%	460,4	408,9	-11,2%
760	Turquie	34,00	39,00	-.2351673	-1.15	380,6	372,0	-2,3%	393,4	378,2	-3,9%
761	Turquie	34,00	38,00	-.5055259	-2.34	318,9	299,2	-6,2%	336,4	296,5	-11,8%
762	Turquie	34,00	37,00	-.486106	-1.38	508,6	476,3	-6,3%	521,6	461,7	-11,5%
763	Turquie	34,00	36,00	-.3475683	-0.87	567,9	529,1	-6,8%	572,2	511,9	-10,5%
764	Turquie	35,00	42,00	-.1687258	-0.51	739,9	756,5	2,2%	759,8	761,1	0,2%
765	Turquie	35,00	41,00	-.5665657	-1.92	446,6	438,8	-1,7%	495,7	442,9	-10,7%
766	Turquie	35,00	40,00	-.6732046	-2.47	568,6	520,9	-8,4%	600,9	535,2	-10,9%
767	Turquie	35,00	39,00	-.133514	-0.63	373,5	357,3	-4,3%	382,0	376,7	-1,4%
768	Turquie	35,00	38,00	-.6352275	-2.51	430,1	404,5	-5,9%	452,7	402,5	-11,1%
769	Turquie	35,00	37,00	-.6289417	-1.71	657,6	637,3	-3,1%	687,8	627,2	-8,8%
770	Turquie	36,00	41,00	-.3085089	-1.10	441,0	454,0	3,0%	471,7	452,6	-4,1%
771	Turquie	36,00	40,00	-.170329	-0.74	425,1	420,8	-1,0%	440,1	433,7	-1,5%
772	Turquie	36,00	39,00	-.0813937	-0.38	404,0	390,6	-3,3%	408,1	413,2	1,2%
773	Turquie	36,00	38,00	-.4195005	-1.26	807,0	782,8	-3,0%	828,9	785,1	-5,3%
774	Turquie	36,00	37,00	-.5595441	-1.44	750,8	723,4	-3,7%	782,8	729,5	-6,8%
775	Turquie	37,00	41,00	.1303549	0.44	484,6	518,3	7,0%	482,1	517,6	7,4%
776	Turquie	37,00	40,00	-.0184024	-0.06	427,8	436,3	2,0%	440,9	449,7	2,0%
777	Turquie	37,00	39,00	-.230695	-1.05	471,9	473,0	0,2%	479,3	484,3	1,0%
778	Turquie	37,00	38,00	-.419861	-1.25	677,0	643,9	-4,9%	695,1	642,6	-7,6%
779	Turquie	37,00	37,00	-.9647335	-2.64	628,8	581,0	-7,6%	667,9	573,8	-14,1%
780	Turquie	37,00	36,00	-2.228561	-5.92	488,4	354,0	-27,5%	556,0	346,1	-37,8%
781	Turquie	38,00	41,00	.2046705	0.50	904,8	951,6	5,2%	883,0	941,2	6,6%
782	Turquie	38,00	40,00	-.1439227	-0.46	517,1	512,7	-0,8%	527,6	520,0	-1,4%
783	Turquie	38,00	39,00	-.1147401	-0.39	427,5	404,4	-5,4%	435,8	407,8	-6,4%
784	Turquie	38,00	38,00	-.3758754	-1.17	618,1	581,9	-5,9%	629,3	575,9	-8,5%
785	Turquie	38,00	37,00	-1.044448	-3.13	347,7	286,2	-17,7%	389,8	277,2	-28,9%
786	Turquie	38,00	36,00	-2.251816	-7.48	285,1	173,5	-39,2%	364,4	164,7	-54,8%
787	Turquie	39,00	41,00	.33	0.72	985,0	1015,6	3,1%	957,3	1009,3	5,4%
788	Turquie	39,00	40,00	-.2554917	-0.76	523,2	525,5	0,5%	543,7	521,0	-4,2%
789	Turquie	39,00	39,00	-.1899954	-0.55	410,9	406,9	-1,0%	433,2	407,4	-5,9%
790	Turquie	39,00	38,00	-.2351497	-0.67	593,8	566,1	-4,7%	598,1	560,4	-6,3%
791	Turquie	39,00	37,00	-1.007491	-2.80	357,0	270,9	-24,1%	389,2	267,7	-31,2%
792	Turquie	39,00	36,00	-1.848827	-6.72	232,9	134,1	-42,5%	302,6	131,9	-56,4%
793	Turquie	40,00	41,00	.0923279	0.20	795,6	794,7	-0,1%	774,9	816,0	5,3%
794	Turquie	40,00	40,00	-.2705319	-0.80	485,3	472,5	-2,6%	501,6	480,3	-4,2%
795	Turquie	40,00	39,00	.2246845	0.65	588,2	608,5	3,4%	585,2	608,7	4,0%
796	Turquie	40,00	38,00	.1345631	0.37	532,5	515,6	-3,2%	520,2	517,2	-0,6%
797	Turquie	40,00	37,00	-.5243277	-1.38	481,0	403,2	-16,2%	487,7	402,1	-17,6%
798	Turquie	40,00	36,00	-1.414186	-5.35	229,4	130,3	-43,2%	273,9	131,9	-51,8%
799	Turquie	41,00	41,00	-.3001929	-0.41	1447,8	1430,2	-1,2%	1402,7	1428,7	1,9%
800	Turquie	41,00	40,00	-.351479	-1.07	526,8	514,1	-2,4%	525,0	510,0	-2,8%
801	Turquie	41,00	39,00	.353996	0.97	730,3	780,4	6,9%	723,5	766,1	5,9%
802	Turquie	41,00	38,00	-.1060828	-0.29	538,7	492,8	-8,5%	527,5	495,5	-6,1%
803	Turquie	41,00	37,00	-.5834	-1.39	533,8	418,5	-21,6%	525,6	423,7	-19,4%
804	Turquie	42,00	41,00	-.074058	-0.16	651,0	630,2	-3,2%	611,1	625,5	2,4%
805	Turquie	42,00	40,00	-.6189724	-2.08	525,8	483,8	-8,0%	523,5	479,8	-8,3%
806	Turquie	42,00	39,00	-.5148309	-1.40	813,1	764,1	-6,0%	809,5	774,6	-4,3%
807	Turquie	42,00	38,00	-.4811908	-1.07	711,1	637,3	-10,4%	704,5	651,1	-7,6%
808	Turquie	42,00	37,00	-.7682041	-2.05	494,2	377,7	-23,6%	488,6	384,8	-21,2%
809	Turquie	43,00	41,00	-.2004439	-0.69	517,5	521,7	0,8%	514,7	512,2	-0,5%
810	Turquie	43,00	40,00	-.2720257	-1.05	562,8	541,0	-3,9%	560,4	547,8	-2,3%
811	Turquie	43,00	39,00	-.2857103	-0.95	611,8	565,3	-7,6%	605,2	585,3	-3,3%
812	Turquie	43,00	38,00	-.3150756	-0.89	761,7	696,6	-8,5%	755,2	714,8	-5,3%
813	Turquie	43,00	37,00	-.4804827	-1.43	1123,6	1050,5	-6,5%	1122,1	1058,2	-5,7%
814	Turquie	44,00	40,00	-.4380484	-1.97	342,8	309,6	-9,7%	352,2	319,3	-9,3%
815	Turquie	44,00	39,00	-.2704607	-1.15	464,8	429,9	-7,5%	466,5	451,0	-3,3%
816	Turquie	44,00	38,00	-.4522484	-1.33	731,6	687,4	-6,0%	735,4	701,6	-4,6%
817	Turquie	44,00	37,00	-.3915485	-1.30	960,2	909,1	-5,3%	965,0	916,1	-5,1%
818	Turquie	44,00	36,00	-.5275887	-1.73	435,6	367,5	-15,6%	441,7	368,3	-16,6%

Annex 4: sensitivity analysis:

5.1: Estimation of the model with autocorrelated cross-sectional errors: dependent variable: log GDP

```
. xtregar lnpib temp prec

RE GLS regression with AR(1) disturbances       Number of obs      =       808
Group variable: pays                            Number of groups   =        10

R-sq:  within  = 0.1654                         Obs per group: min =         4
       between = 0.4839                                        avg =      80.8
       overall = 0.3357                                        max =       255

                                                Wald chi2(3)       =    126.74
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------ theta -------------------------------
       min        5%        median        95%        max
    0.0888    0.3114        0.6224     0.6828     0.6828
```

lnpib	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
temp	-.1873635	.0233972	-8.01	0.000	-.2332213	-.1415058
prec	.0020275	.0004818	4.21	0.000	.0010832	.0029719
_cons	21.10546	.5778834	36.52	0.000	19.97283	22.23809
rho_ar	.48387373	(estimated autocorrelation coefficient)				
sigma_u	.66393796					
sigma_e	1.8372259					
rho_fov	.11551076	(fraction of variance due to u_i)				

5.2: Estimation of the model with autocorrelated cross-sectional errors: dependent variable: log GDP per capita

```
. xtregar lnpibhab temp prec

RE GLS regression with AR(1) disturbances       Number of obs      =       808
Group variable: pays                            Number of groups   =        10

R-sq:  within  = 0.0022                         Obs per group: min =         4
       between = 0.0159                                        avg =      80.8
       overall = 0.0042                                        max =       255

                                                Wald chi2(3)       =      1.00
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2        =    0.8005

------------------------------ theta -------------------------------
       min        5%        median        95%        max
    0.4891    0.7675        0.8990     0.9171     0.9171
```

lnpibhab	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
temp	-.0023224	.0084191	-0.28	0.783	-.0188235	.0141787
prec	-.0001789	.0001793	-1.00	0.318	-.0005303	.0001725
_cons	7.69381	.3050987	25.22	0.000	7.095827	8.291792
rho_ar	.33732626	(estimated autocorrelation coefficient)				
sigma_u	.74263846					
sigma_e	.6551563					
rho_fov	.56234165	(fraction of variance due to u_i)				

Part 3: Policy aspects of climate change in MENA countries[11]

This last part deals with the initiatives that have been undertaken in MENA countries to deal with climate change. Most of such initiatives have been implemented jointly with donors as the European Commission and the World Bank. The role of the EU concerning projects in MENA countries related to climate change will also be investigated.

Section 1: Policies adopted by MENA Countries to Overcome Climate Change

There are several initiatives that have been undertaken in MENA countries to deal with climate change. For example, MENA countries benefit from the UNEP Mediterranean Action Plan (UNEP/MAP) that was founded in 1975 by 16 Mediterranean countries and the European countries (http://www.unepmap.org/). The MAP is concerned with helping to assess and control marine pollution and to formulate environmental regulations. One of its centers is the Regional Activity Centre for Cleaner Production (CP/RAC). This center promotes mechanisms leading to sustainable consumption and production patterns and sound chemicals management in Mediterranean countries. Moreover, in the framework of the MAP, in 2009, MENA countries and EU agreed with the World Bank, regional and international organizations, as well as other NGOs, to establish a Strategic Partnership for the Mediterranean Large Marine Ecosystem (LME) with over $ 100 million in funding for the joint implementation of actions for the de-pollution of the Mediterranean. This project contributes to sustainable development and promotes the use of renewable resources in MENA countries that include Algeria, Egypt, Lebanon, Libya, Morocco, Syria, and Tunisia. In addition, a large number of energy research centers are being established in MENA countries in various terms of association with governments and or public and private universities (Ghaddar, 2010).

There exist also several donors who have implemented several projects including, for example, the German Federal Ministry for Economic Cooperation and Development which has approved a regional project entitled “Adapting forest policy conditions to climate change in the MENA region”. The aim of this project has been to improve the political framework conditions for sustainable management of forest ecosystems in order to preserve forest-related environmental

[11] This part was written by Ahmed F. Ghoneim with the assistance of Heba El Deken, and data collection of Yasmin Ahmed.

services in light of the climate change in selected countries of the MENA region, which have sizable forest areas (Morocco, Algeria, Tunisia, Turkey, Syria and Lebanon). The project period is from July 2010 to July 2014 (GTZ, 2009). Moreover, the World Bank has adopted a strategy towards several MENA countries through its MENA strategy (World Bank, 2007) that aims at helping the countries to overcome the negative impact of climate change through adaptation and mitigation efforts. UNDP has been active in supporting MENA countries to draft their National Climate Change Action Plans.

The aforementioned examples show that several policies are being enacted in MENA countries with the help of donors. Below we mention some anecdotal evidence of climate change mitigation and adaptation policies adopted in some of the MENA countries.

Egypt

In Egypt several efforts have been undertaken on policy and institutional levels to overcome the problems associated with climate change. Among such efforts has been the establishment of national climate change committee in 2007 (by a prime ministerial decree) with the target of preparing a national climate change adaptation strategy. Parallel efforts have been undertaken where the Supreme Energy Council has developed national policies associated with renewable energy and energy efficiency. The emphasis of such initiatives and concerns of different committees shifted by time from mitigation measures (given that Egypt's GHG emissions are considered minute by global standards) to adaptation measures (Agrawla et. al, 2004). Regarding water management, a local area circulation model has been developed which predicts the impact of climate change on Egypt and Nile Basin countries. Moreover, several means of cooperation between Egypt and Nile Basin countries were introduced and the capacity of researchers tackling such issue has been enhanced. Regarding agriculture, several policies were adopted to choose high case crops, change crop variety and crop calendar, skip irrigation at different growth stages, change of farm systems and fertilization, the development of special adaptation fund for agriculture, and improving scientific capacity. In energy consumption rationalization, there have been several policies adopted to substitute fossil oil with natural gas where public transport and taxies have been replaced with ones using natural gas. Moreover, several projects have targeted increasing the share of renewable in the electricity generation mix up to 20%, depending mainly on expanding wind power, solar and including hydro power. The aim of such policies has been achieving the target of reducing the energy end-use consumption by 20% via robust and strict programs for energy efficiency improvements over fifteen years period (2007 –2022). As for air pollution specific projects have been introduced as controlling the process chain in such a way to reduce the GHG

emissions (such as perflurocarbons (PFC's) emission reduction in aluminum industry) (Abul Azm, 2009).

To overcome the SLR several efforts have been undertaken including the construction of concrete sea walls to protect beaches from sea rising (costing more than US$ 300 million). Moreover, the Ministry of State for Environmental Affairs (MESA) prepared a National Strategy Study" which included a vulnerability index pinpointing the most endangered regions and suggested means for adaptation. Also, the Egyptian Environmental Affairs Agency (EEAA) suggested a number of policy options that can be adopted to overcome the negative impact of SLR on tourism including beach nourishment by depositing sand onto beaches, construction of breakwaters, setting regulations to restrict development in vulnerable areas, changes in land use and Integrated Coastal Zone Management (ICZM) (Elsharkawy et. al, 2009). A list of some of the projects that have been established in Egypt are depicted in box 2 below

Box 2: A number of mitigation projects have been initiated in Egypt

Technology cooperation agreement pilot project (TCAPP)
Acknowledging technology transfer as one of its highest priorities, Egypt is focusing on initiatives such as the Technology Cooperation Agreement Pilot Project (TCAPP) in cooperation with the U.S. Country Studies Program. The TCAPP is chartered to develop consensus among key Egyptian organizations on a set of high priority, climate-friendly, technology issues aimed at successful commercialization. Results are expected to produce candidate technology transfer areas for consideration under the guidance of the National Climate Change Committee. Market development plans for selected technologies are currently underway.

Promotion of wind energy for electricity generation
This is an active program within the Ministry of Electricity and Energy through the New and Renewable Energy Authority. Supported by many international donors, this project aims at installing 600 MW of wind turbines by the year 2005. 300 MW are already contracted through different donors, and most of them are scheduled to be operating by 2003.

Fuel cell bus demonstration project
Through GEF, UNDP is supporting fuel cell bus demonstration projects in Cairo, Sao Paulo, New Delhi, Beijing, and Mexico City to reduce GHG emissions and other pollutants. The demonstration in Cairo features eight fuel cell buses as well as hydrogen production and supply facilities. The program will run for five years, with three years devoted to driving, monitoring and testing performance. Service was implemented in 2001.

Hybrid electric bus technology
The overall objective of this project is to introduce a viable hybrid-electric bus that will have significant benefits and sustainability in various segments of the country. The project is funded by GEF and implemented by UNDP and the Egyptian Social Development Fund. The project will be applied to high priority historical sites starting with the Giza plateau where the ancient pyramids are located.

Natural gas motorcycles
This is a Canadian technology project developed to reduce the emissions of GHG by converting two-stroke engines used in motorcycles to compressed natural gas (CNG). The project will be implemented in three phases: identification of capabilities and barriers, demonstration of the technology, and finally a hand-over and transition to the local market.

Methane recovery from landfills
This project involves the recovery of methane generated in landfills in cooperation with the Canadian Government and Industry Canada. The proposed work plan involves the design and construction of two bioreactor landfill cells in Cairo. After the completion of the project, the team will hand over the two bio-reactor cells to the Cairo Solid Waste Management Authority. On-site training will be provided to the Egyptian staff for future operation and monitoring. A general policy of encouragement of building up solid waste landfills has been implemented and associated landfills started their operation in Alexandria in October 2001.

Integrated solar thermal/natural gas programs

The New and Renewable Energy Authority (NREA) has prepared a program for implementing a series of solar thermal power plants. This includes an Integrated Solar Combined Cycle System (ISCCS) with a 100-150 MW capacity at Kuraymat. The GEF/World Bank funded project began in 1997 and a second project of likewise capacity is anticipated to go into operation before 2005.

Energy efficiency improvement and emissions reduction project

This four-year UNDP/GEF project was designed to achieve reductions in GHG emissions through policies that promote demand-side management and energy conservation while creating an enabling environment for energy efficiency. The project focuses on the transmission and distribution of electrical systems, co-generation, and market support for emergency energy service companies.

Fuel switching

Current Egyptian energy policy calls for shifting the demand from liquid fuel oil to natural gas given the abundance of natural gas supply, which is estimated at 43 trillion cubic feet (CF). Fuel switching is currently undertaken in electricity generation, industry, and residential sectors. USAID assisted Cairo Air Improvement Program (CAIP) furnished Cairo's municipal bus companies with fifty CNG-powered rolling bus chassis, while the Government of Egypt is contributing the bus bodies. CAIP helped also in equipping the CNG bus maintenance garages required for these fleets, and introduced CNG-related safety standards for fuel tanks, fueling stations, and fuel systems. Serving as an example for public private sector partnerships, since 1996 the private sector has been building and operating 27 CNG fueling stations and converting over 27 vehicles including taxis to CNG. The USAID Commodity Import Program helped in purchasing fueling equipment for many of these CNG filling stations.

Source: Agrawla et al (2004)

Jordan

The government in Jordan has also adopted several policies to mitigate climate change where in the case of water reservation, sector measures have been adopted including the increase of the water price and the restrictions of water allocation for the agricultural sector and in the energy sector several policies have been adopted to diversify the energy usage mix by importing natural gas from neighhbouring countries in a way to lessen depends on imported fossil oil (Beck, 2011).

Turkey

Turkey is among the MENA countries which have already undertaken serious steps to deal with climate change. For example, Turkey, has begun to design climate adaptation plans for selected river basins and agricultural areas, Moreover, it has already begun to replace open-lined canals with more efficient delivery systems, such as pressurized pipe systems as a way to reduce water loss (Sowery and Weinthal, 2010). Furthermore, Turkey has adopted other measures including monitoring sea level through four tide gauges allocated along the Mediterranean, Aegean and Marmara Sea coasts (Demir and Gürdal, 2000) and placed hard structures as well as dunes, mostly on the Black Sea side (World Bank, 2009a).; promoting integrated coastal zone management (CZM) where a specific agency following the Ministry of Environment was established in 1997 with the aim of preparing, implementing and evaluating environmental management plans. A Coastal Area Management Program (CAMP) project was carried out in the Bay of Izmir with the support of the MAP; raising public awareness where a project entitled "Our Future is Warming" was launched in 2008 aiming at targeting 81 city centers and 810,000 people by 2011 to raise their awarenss on climate change (World Bank 2009b; Aladag and Ugurlu, 2009).

Israel

Israel has focused on reduction of GHG emissions, especially that Israel has been the highest among MENA countries investigated that recorded high level for per capita CO2 emissions. Moreover, and in 2004, a Designated National Authority for authorizing Clean Development Mechanism (CDM) projects was established. Most of the efforts have focused on energy efficiency with several projects initiated in this regard and a switch in electricity generation to natural gas has proceeded with significant steps (Israel Ministry of Environmental Protection, 2009).

Syria:

Although Syria has not been a major contributor in the emission of GHG, it has been affected by the impact of probable global climate change. Several mitigation and adaptation measures have been adopted and included: energy efficiency methods and projects by oil and gas companies, shift to cleaner fuels as natural gas, maintenance of pipes and prevention of leakages using modern supersonic equipment to detect leaks and the injection of anti-corrosion chemicals in pipelines; and storage of CO2 in oil fields through injecting CO2 in semi-depleted oil fields (UNFCCC, 2010). Syria has also adopted clean development mechanisms (CDM) in a number of projects related to energy efficiency in different industries (e.g. cement and electricity generation) (RCREEE, 2011).

On the water management front, the Syrian government has undertaken a number of measures which were even included in the 10^{th} Five Year Plan (2006-2010) by setting a comprehensive national plan for integrated use of available water resources through focusing on better usage of ground water, improving the efficiency of water usage, establishing a comprehensive evaluation system for various water facilities in the sanitation and irrigation , and establishing an integrated water resources monitoring system (Abed Rabboh, 2007; UNFCCC, 2010)

To accommodate the SLR, the Syrian government has also started undertaking a number of steps and measures as shown in its initial national communication plan that included assessing the present pressure impact and the possible impact of climate change on coastal systems (SLR, wind, temperature increase, geology); mapping institutions related to coastal activities and assessing their capacity; formulating a framework that incorporates integrated coastal zone management (ICZM), disaster management (DM), and research as vital cross-cutting adaptation options, with measures by sector to alleviate the potential threat of climate change on coastal areas; and enhancing the capacity of institutions and raising publing awareness on risks posed by SLR (UNFCCC, 2010).

Morocco:

The Moroccan government has adopted several measures towards controlling the GHG emissions where a renewable energy target of 42% of total electricity capacity was set to be achieved by 2020 through auction and tender mechanisms; generating electricity through solar and wind through photovoltaic (PV) technology where there are 160,000 solar home systems in about 8% of rural households are installed with a total capacity of 16 MW (Abdel Gelil, 2009). Moreover, CDM projects have been initiated in several areas of the country, as well as energy efficiency projects and forestation and reforestation projects (for further details see Agoumi, 2004; Marquina, 2005).

Concerning the SLR, Morocco has adopted a number of measures that included preparing a study on the audit of the Moroccan coast where this audit aimed to provide a coherent set of instruments adapted to the specificities of Moroccan coastal areas, creating new management arrangements towards an effective and efficient sustainable management; introducing a number of projects as CAMP Morocco and Med Wet Coast projects that tackle socio economic and bio diversity effects of climate change; establishing a Coastal Action Plan to efficiently protect the environment as well as to promote the economic and social development in the coastal zone of Nador Lagoon; and launching of sustainable climate change adaptation project which focuses on adaptation to SLR and extreme weather events in the eastern Moroccan Mediterranean coast (European Commission, 2010; World Bank, 2012).

Tunisia:

The Tunisian government has also undertaken a number of measures to enhance energy efficiency and reduce GHG emissions. For example, the Tunisian Solar Plan initiative was adopted aiming at commissioning 110 MW of Solar Thermal Electricity Generation (STEG), 20MW of PV (photovoltaic)[12], 280MW of wind capacity by 2016. (Saidi, 2011). Moreover, a standardization program for energy-driven equipment was adopted which led to the issuance of energy labeling and minimum energy efficiency standards for refrigerators in 2004. As a result, it is forecasted that by 2030 this program will have saved 3.4 Mt of CO2 emissions (LIHIDHEB, 2007; Abdel Gelil, 2009). Finally a number of CDM small scale projects were introduced as wind generating energy projects, landfill valorization project, solar heater projects, liquefied natural gas usage in transport; and public lighting project aiming at substituting conventional bulbs by sodium bulbs in a number of Tunisian districts (UNEP, 2004).

[12] It is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect.

This section has revealed the different projects undertaken by MENA countries with regard to climate change mitigation and adaptation measures. The section, based on anecdotal evidence and literature available, showed that MENA governments are in fact aware of the climate change challenges. The lack of comprehensive database on efforts undertaken in each area prevented us from digging more in details. Yet, the message is clear, which is MENA countries are not starting from scratch in this area, and that their governments are aware of the urgency of the matter. There is still a large room for coordinated and joint efforts among MENA countries, an issue which we tackle in the coming section.

Section 2: What Needs to be Done and what Role for EU in this Regard

Increased integration between EU and MENA countries can result in increasing environmental pollution in MENA countries. Yet, there is no clear cut conclusion regarding the relationship between trade liberalization and pollution. There exist several channels through which the impact of trade liberalization on environmental pollution can be positive or negative. There exist the composition effect (by which a change in economic activity happens), the technology effect, and the scale effect (by which expansion in economic activity takes place). All of the three effects can be positive and can be negative on pollution, hence CO2 emissions and ultimately climate change. Yet, many of the environmental abuses attributable to trade liberalization are more linked to domestic policies rather than trade liberalization (Chemingui, 2001). This implies that there is a role to be played by the EU to help MENA governments in overcoming such negative impacts by undertaking the necessary measures at home.

MENA governments are aware of climate change challenges (World Bank, 2011). For example, in the Arab League context, the Council of Arab Ministers responsible for the environment in its 19th session in 2007 has adopted the Arab Ministerial Declaration on climate change, which constituted the base for future action and reflects the joint Arab position in dealing with climate change challenges (League of Arab States, 2007). The governments of many MENA countries already implement several individual projects designed to adapt and/or mitigate the negative effects of climate change. Yet, such efforts remain insufficient to create large scale, meaningful positive change. There is a need to undertake structural and comprehensive change in governmental policies. Moreover, such changes need to be well coordinated to arrive at positive impacts. Several MENA countries have still did not develop their National Adaptation Programs of Action (NAPAs), following the provisions of the United Nations Framework Convention on Climate Change (UNFCCC). The NAPAs are of paramount importance as they intend to facilitate the identification of priority activities for a country in the area of climate change. Each MENA country should

prepare a national low-carbon development strategy. This is of paramount importance as such strategies will identify how each MENA government intends to reduce each country's emissions based on its national priorities (Booz&Co, 2006). (See table 3).

Table (3): UNFCCC's NAPA Ratification Status of MENA Countries

Participant	Signature	Ratification/Accession	Entry into force	Submission of first NC
Algeria	13 Jun 1992	9 Jun 1993	21 Mar 1994	30 April 2001
Egypt	9 Jun 1992	5 Dec 1994	5 Mar 1995	19 July 1999
Israel	4 Jun 1992	4 Jun 1996	2 Sep 1996	18 Nov 2000
Jordan	11 Jun 1992	12 Nov 1993	21 Mar 1994	6 March 1997
Lebanon	12 Jun 1992	15 Dec 1994	15 Mar 1995	2 Nov 1999
Libya	29 Jun 1992	14 Jun 1999	12 Sep 1999	NA
Morocco	13 Jun 1992	28 Dec 1995	27 Mar 1996	1 Nov 2001
Syria	NA	4 Jan 1996 [a/]	3 Apr 1996	29 Dec 2010
Tunisia	13 Jun 1992	15 Jul 1993	21 Mar 1994	27 Oct 2001
Turkey	NA	24 Feb 2004 [a/]	24 May 2004	Didn't submit

[a/] Accession
Source: UNFCCC
http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php
http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php

Regarding CO2 emissions, MENA countries should focus on reducing CO2 emissions. Low carbon growth can bring significant benefits for MENA economies, including productivity gains in energy use, improved air quality, and reduced traffic congestion. There is a large room for its reduction through energy saving projects, especially that there is a huge potential which has been estimated to be in the range of 13% of total energy consumption in MENA countries (Babiker and Fehaid, 2011). This requires a revisit of the existing energy policies with the introduction of a new comprehensive framework where pricing and efficient targeted subsidies are its main elements. The EU can help by providing technical assistance to MENA countries on how to create sensitive price mechanisms that count for social concerns as well as how to adopt efficient targeted systems of energy subsidies. The role of EU in helping MENA countries in improving energy efficiency mechanisms is of paramount importance (Quefelec, 2008).

Energy efficiency, A number of projects have been initiated with the international community including climate finance instruments as Clean Technology Fund (CTF), where it finances concentrated solar power in a number of MENA countries as Algeria, Egypt, Jordan, Morocco, and Tunisia. CTF, among similar projects, can help MENA countries in overcoming the problems associated with energy efficiency by providing energy renewable resources. The activation of an "Adaptation Fund" entrusted to the World Bank as well as the Global Environment Facility (GEF) can continue to help MENA countries to overcome climate change challenges (World Bank, 2010).

In terms of *water management* there are a number of adaptation measures that can be implemented including rational usage of water through introducing new pricing systems that count for political economy conditions in several MENA countries. Also there is a need to include systems for reuse of water. The issue of non-conventional measures of water supply as desalinization should be also considered.

In reduction of *GHG emissions*, capacity building initiatives and technology transfer are needed to help MENA countries develop energy efficient systems that minimize global GHG emissions, which take into consideration social aspects to minimize negative impact on the poor. The majority of MENA countries have an outstanding potential for solar energy. Using concentrating solar thermal power (CSP) plants to power sea water desalination on either by electricity or in combined generation process with steam has the potential to solve the water scarcity problem in North Africa (OSS and UNEP, 2010).

The EU has launched a number of initiatives which involve MENA countries. For example, there is a Mediterranean component of the EU Water Initiative (EUWI), named (MED EUWI), which is designed to contribute to achievement of Millennium Development Goals (MDGs) targets for drinking water and sanitation in the Mediterranean, within an integrated approach to water resources management. Also there exist under the MEDA Regional Indicative Programming, the Euro-Mediterranean Regional Programme for Local Water Management (MEDA Water Programme) a number of projects that have been funded which address indirectly climate change issues (e.g. the MEDROPLAN project on Improving drought preparedness, the ADIRA project that explores the introduction of autonomous desalinization programs or the IRWA project on improving irrigation water management) (Morocco, Spain, and Greece 2008). In addition to the aforementioned projects, the EU has helped MENA countries through the European Neighborhood Policy (ENP) and its financial instrument (the European Neighborhood Policy Instrument (ENPI)) to finance a number of projects. Central to the ENP are the bilateral Action Plans between the EU and each ENP partner (12 of them were agreed). The Action Plans set out an agenda of political and economic reforms with short and medium-term priorities of 3 to 5 years. Bilateral Action Plans between EU and Egypt, Israel, Lebanon, Morocco, Tunisia and Jordan encompass a comprehensive set of priorities to address different areas including climate change. The ENP is not yet fully ‘activated’ for Algeria, Libya and Syria since those have not agreed upon Action Plans so far. The Action Plans included a number of cooperation schemes and projects that tackle climate change adaptation measures. The majority of the action plan projects and cooperation schemes focused merely on environmental aspects related to the pollution of the Mediterranean, as well as usage of

energy efficiency mechanisms and CDM. Specific aspects were devoted extra attention as water pollution and solar energy production (see Action Plans of different MENA countries with EU[13]. Several initiatives under the Action Plan required the cooperation among different Mediterranean countries including those in the South. What is needed is more specific projects with an accelerated pace as Action Plans have suffered from excessive delays and have been disappointing so far in keeping up to the expectations of both the EU as well as MENA countries.

Box 3 shows some of the projects which include EU financial and technical assistance to MENA countries.

Box 3: The EU ongoing projects with the MENA countries

Regional Euro-Mediterranean Programme for the Environment (REMPE)

The SMAP Clearing House - an Internet Portal to navigate the Mediterranean "Sea" of Information on the Environment (including North Africa). The Clearing House aims at providing the REMPE community with a tool for capturing, for each SMAP priority area, the current situation in terms of: development of the environmental projects; environmental information at national and regional levels; trends and directions at stake for environmental management; policies and strategies; approaches and methodologies; and instruments and practices

The Mediterranean Renewable Energy Centre (MEDREC):

MEDREC is a centre of excellence based in Tunis for training, information dissemination, networking and development of pilot projects in the field of renewable energies, and represents the operational tool and reference point for the implementation of MedREP in the region. It was established in Tunis on January 26, 2004, by an agreement among the Italian Ministry for the Environment and Territory, the Tunisian Ministry for Industry and Energy (TMIE) and *l'Agence Nationale des Energies Renouvelables* (ANER).

Source: OSS and UNEP (2010)

Other EU governments and donors have been helping MENA countries on bilateral basis including for example, the support provided by the German BMZ/GIZ to the Tunisian Government preparation and the implementation of the National Climate Change Adaptation Strategy, and to mainstream climate change into the implementation of the UN Convention on Combating Desertification (UNCCD) and The Dutch support provided for the Government of Egypt for the development of a planning support system to analyze management for Nile inflows and releases in the context of climate change within Lake Nasser project (Morocco, Spain, and Greece, 2008).

Based on the above review it seems that there is a still a wide room for adoption of further adaptation policies, which include: 1) policies that aim at disaster reduction and risk management, including early warning, preparedness, emergency response and post-disaster recovery which are still not widely used in MENA countries; 2) national plans that have clear steps for implementation and monitoring regarding specific key areas as water management, agriculture sector, coastal zones, biodiversity and ecosystems, energy saving, urban management, tourism adaptation, while taking into account the cross-sectoral implications; 3) building economic and social resilience through the diversification of economic activities to reduce vulnerability to climate change.

[13] For more details on European Neighbourhood Policy **(**ENP) Action Plans and Country Reports, see http://ec.europa.eu/world/enp/documents_en.htm#2.

Adaptation measures adopted in MENA countries should focus on simple and low cost adaptation measures building on traditional knowledge, meeting domestic and local conditions, and aiming at achieving sustainable developmental goals. Adaptation policies should prioritize their interventions based on the most urgent and vulnerable areas whether that is coastal zones or agriculture sector. Such priorities differ from one country to another. Yet there are general policies that can be adopted in the majority of MENA countries to achieve the required goals. Among such policies are improving irrigation and drainage systems, developing new water resources, extending sanitation systems, enhancement of public awareness activities, and establishment of specific climate change risk mitigating funds. Tradeoffs between feasible adaptation measures and their negative social consequences should be avoided. For example, improving efficiency in water usage could require using agricultural technologies such as drip irrigation which could result in reduced demand for labor.

In the *energy sector*, mitigation measures should focus on switching to natural gas, utilization of cleaner fossil fuel systems as clean-coal technologies and nuclear power for energy generation, and encouragement of utilizing renewable energy sources such as wind and solar power. Adaptation measures should focus on enhancing energy use efficiency and demand side management actions by rationalization of energy usage mainly through institutional and regulatory reform actions. MENA countries have different kinds of ad hoc initiatives and plans that address climate change, yet most of them lack comprehensive national plans (Haddad, 2009). Moreover, the majority of MENA countries do not have systems that are able to monitor climate change GHG from different sectors systematically, and suffer from weak detailed databases of knowledge and research related to climate change.

Regarding *water management strategies* and According to Agarwala et. al (2004) where they reviewed donors' project in Egypt, they identified that there are few donor projects on coastal zones. Hence, they indicated that the absence of climate change concerns in these projects could be a significant omission, given the urgency of climate change problems especially those associated with sea level rise and saline intrusion. They also pointed out that despite the existence of several institutions dealing with climate change, they remain short in real implementation due to the overriding of other urgent developmental concerns. Specific aspects of extra attention were identified and especially those that address developmental and demographic pressures that exacerbate coastal vulnerability including coastal pollution. The enactment of laws that reduce coastal vulnerability and correct existing distortions that exacerbate coastal vulnerability to sea level rise was also identified as a priority. There is a need to adopt effective adaptation measures that are closely intertwined with water resources management. This will require implementation of

water demand management strategies which may require capacity building and awareness raising across institutions and individuals in the society as well as supply-side measures including ways to improve rain-harvesting techniques, increasing extraction of ground water, water recycling, desalination, and improving water transportation.

There is also an urgent need for MENA countries to adopt joint work strategies and investment in research and development and capacity building activities (Nasr, 2009), especially that unilateral effective actions have been the norm so far (Sowerly and Weinthal, 2010). Conflicting national interests have been evident in the unilateral actions by governments in the region to build dams, extend irrigation networks, tap underground aquifers, and divert water for industrial and municipal uses. Regional initiatives created to deal with such challenges have remained non-existent or weak, which has been the case, for example, with the failure of the Euro- Mediterranean Water Ministers Conference to reach consensus on a strategy to deal with increasing water stress around the Mediterranean (Sowerly and Weinthal, 2010). MENA countries can establish regional R&D networks based on the existing research institutions for climate change technology development and commercialization that permit sharing of resources and cost for innovation infrastructure and expensive equipment. Moreover, areas of research as the field of renewable energy and energy technology should be promoted, while taking into consideration that this is a multi- and interdisciplinary and requires integration of skills from different fields including basic sciences, various engineering disciplines, and economics (Ghaddar, 2010). MENA countries can also use tax policy to promote private venture capital investment in climate change technology.

Hence, the above review showed that there are several climate change mitigation policies adopted in MENA countries, however the room for further improvement in such projects, consolidation of efforts, and focus on main priorities are needed, which is to be reflected in their NAMA and through better adoption of measurement, reporting, and review (MRV) system, especially that with the exception of Israel, none of the MENA countries have proposed national emission targets or goals to 2020. More emphasis should be put on adaptation measures. The tradeoffs that existed between urgent developmental aspects from a political economy perspective (as poverty alleviation and food security) and climate change concerns (which were looked upon as non-urgent matters) are fading away. Climate change mitigation and adaptation measures are becoming an integral element of developmental policies addressing such urgent issues. MENA governments have realized that, yet still this has not been fully translated in their domestic developmental plans. In other words, the political will still need to be strengthened to ensure that the climate change issues are seriously addressed.

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Conclusion

This research has shown that climate change has started in MENA countries since the 1970s. In particular, Maghreb countries have been more concerned with global warming, which generally occurred from the early 70s. The rise in temperature after this structural change is about +0.3/°0.4 degrees Celsius for these countries. In addition, global warming has accelerated in the early 2000s (+0.9/+1.2°) as compared to the period before the structural change. Global warming also concerned Mashrek countries, although to a lesser extent (+0.3/+0.6 °C).

The decrease in rainfalls is also very significant. It mainly concerns Mashrek countries. In addition, this process started earlier than global warming (often before the 1930s). In the most recent period (1990-2008), annual average rainfalls in Mashrek countries and Libya reached only 50% those recorded in the period (1900-1929). Conversely, the reduction in precipitations is much less dramatic in most Maghreb countries and Turkey

Basically, these results correlate the predictions highlighted by the literature review. As a matter of fact, we have shown that climate change is not only expected in the future, as the literature predicts, but this process has started since the 70s and concern all MENA countries.

It has also been shown that there is significant evidence that the climate change has a negative impact on GDP and GDP per capita in MENA countries. These results are in line with the predictions of the literature review developed in the first part of this study, which suggested that climate change would lead to significant losses in terms of GDP. The present research tends to show that these negative effects on GDP have already taken place. Using the standard OLS estimator, results show that any increase in temperature by 1°C leads to a decrease in GDP per capita which ranges between 17% in Egypt to 0% in, Turkey, Tunisia and some Mashrek countries. This range is very close to results at worldwide level which show that 1°C rise in temperature leads to a decrease in GDP per capita by 8.5% (Dell et al., 2009). The impact of the reduction of precipitations is less straightforward. It depends on the country sample and the estimator which is used. Still, there is still some statistical evidence that the decrease in precipitations observed in MENA countries reduces GDP and GDP per capita in these countries.

There are several initiatives that have been undertaken in MENA countries to deal with climate change. Most of such initiatives have been implemented jointly with donors as the European Commission and the World Bank. In each MENA country, several projects dealing with climate change have been set, signaling that governments are aware of the potential negative consequences of climate change. Yet, such efforts remain insufficient to create large scale, meaningful positive

change. There is a need to undertake structural and comprehensive change in governmental policies. Moreover, such changes need to be well coordinated to arrive at positive impacts. Several MENA countries have still did not develop their National Adaptation Programs of Action (NAPAs), following the provisions of the United Nations Framework Convention on Climate Change (UNFCCC).

Adaptation measures adopted in MENA countries should focus on simple and low cost adaptation measures building on traditional knowledge, meeting domestic and local conditions and aiming at achieving sustainable developmental goals. Adaptation policies should prioritize their interventions based on the most urgent and vulnerable areas (coastal zones or agriculture sector). Such priorities differ from one country to another. Yet there are general policies that can be adopted in the majority of MENA countries to achieve the required goals as follows:

In addition, MENA countries should focus on reducing CO2 emissions. Low carbon growth can bring significant benefits for MENA economies, including productivity gains in energy use, improved air quality, and reduced traffic congestion. There is a large room for its reduction through energy saving projects. This requires a revisit of the existing energy policies with the introduction of a new comprehensive framework where pricing and efficient targeted subsidies are its main elements. In terms of water management there are a number of adaptation measures that can be implemented including rational usage of water through introducing new pricing systems that count for political economy conditions in several MENA countries. Also there is a need to include systems for reuse of water. The issue of non-conventional measures of water supply as desalinization should be also considered.

For reducing GHG emissions, capacity building initiatives and technology transfer are needed to help MENA countries develop energy efficient systems that minimize global GHG emissions, which take into consideration social aspects to minimize negative impact on the poor. The majority of MENA countries have an outstanding potential for solar energy. In the energy sector, mitigation measures should focus on switching to natural gas, utilization of cleaner fossil fuel systems as clean-coal technologies and nuclear power for energy generation, and encouragement of utilizing renewable energy sources such as wind and solar power.

Hence, and despite the efforts undertaken, the room for further improvement is still wide, including consolidation of efforts, and focus on main priorities where MENA countries could adopt joint work strategies and investment in research and development and capacity building activities.

Annex A: Some Referees Comments

Femise referees have made comments on the section titled “Global Warming and Other climate Changes in MENA Countries: Fiction or Reality,” of the present reports. As stated by one of the three referees, the authors use in this section a standard OLS linear regression with the variable “temperature” (and precipitation) as the dependent variable and the variable “year” as the independent variable to establish for the period 1900-2008 whether or not countries in the MENA region have experienced a rise in temperature, or climate change. This econometric approach may be not adapted to the issue. The main issue is whether the trend temperature rise reflects systematic warming or whether it is simply an effect of natural variability. Simply fitting a linear trend does not allow to answer to the question since it is of crucial importance to analyse the underlying stochastic process generating the data, as has been emphasised by, for example, Galbraith and Green (1992), Seater (1993) and Koenker and Scorfheide (1994) in the present context of long run temperature data. Indeed, the last 3 decades have witnessed an explosion of studies that have examined global average temperature from the perspective of testing for unit roots to ascertain whether the stochastic process generating global temperature is difference stationary (DS) or trend stationary (TS). In the earlier studies of the time series properties of observed global temperature series, the presence of a deterministic trend was interpreted as an evidence for a long-term, human-induced, global warming process. In contrast, under a stochastic trend, the recent warming trend was interpreted as part of natural variations and this trend should not be expected to continue in the long-term. This debate continues. See in particular the paper by Kaufmann and others (2010) for applying cointegration techniques to global and hemispheric temperature series and to “forcing” variables and how to interpret a stochastic trend in temperature series.

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Annex B: Answer of the Authors to the Referees Comments

The authors of the report precise that the main objective of part 2 is simply to observe and comment long run series of temperature and precipitation and to detect potential structural changes. This analysis is then used to assess the impact of present and past trends of temperature on the economic activity of MENA countries (part 3) which is the core of the report, using specific spatial econometrics and panel data.

However, we do not intend to answer the question whether recent trends will continue in the future. In other words, the section does not intend to forecast temperature and precipitations in the future. This would require determining the time series properties series (determinist or stochastic trends) which goes beyond the scope of this report.