

## Desertification and migration - a challenge to co-operation

### Food for thought for Egypt

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### Introduction

Since the 1980s, desertification<sup>1</sup> of arid regions<sup>2</sup> is an issue which increasingly raises concern of the international community. After a period during which the ecological aspects of the phenomenon have been in the focus of interest, since the 1990s, the interrelationship between desertification and population growth has aroused increasing attention and has alarmed politicians and scientists alike. High rates of population growth in arid regions whose limits of ecological carrying capacity are obvious, suggest that out-migration of part of the population would be a positive solution. Hence, observed adaptive processes by out-migration are regarded as more a problem of the receiving regions, like urban centres, than of the sending areas. The question what results for arid source regions raises less concern, as out-migration from there is considered as a relief.

In the whole Middle East and North Africa (MENA) region which is one of the most fragile environments of the world, at the same time arid, affected by desertification and characterised by high natural population growth, migratory movements play a decisive and increasingly important role for the economic development. As regional discrepancies between economic carrying capacity and population density grow, people look for alternatives outside. Few studies, however, have been searching for the consequences which these adaptive processes bear on the region of out-migration and on the population which is left behind.

This also applies to Egypt, which is a striking example to the conditions which prevail in the region. The role of migratory movements that take place in reaction to increasing desertification, can hardly be overestimated. Nevertheless, when going through the available literature it becomes obvious that almost no research has been done about this issue. Hence, a paper issued by the World Bank with the initial intention to provide an overview over Egypt's demographic development, its causes and consequences, starts with the diagnosis: „Data on migration are so unreliable and the prospects for migration to relieve population pressure are so uncertain that this paper concentrates on changes in mortality and fertility„ (Cochrane and Massiah 1999:1). Few studies have been done about the impact of international labour migration on the rural home regions of the migrants, in spite of the fact that international labour migration is a dominant factor of the country's economic development. Even more scarce are studies which focus on the impact of internal migration on the rural source regions.

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<sup>1</sup> According to what has been agreed at the 1992 Earth Summit, desertification is defined as „land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities.“ (Secretariat of the UNCCD 1995:12)

<sup>2</sup> Arid regions are defined as those with an average precipitation of less than 200 mm p.a. Semi-arid regions are those with a precipitation of 200 to 400 mm p.a. (WRI 1994)

Against that background, it is essential for policy makers in all areas, to gain more insight into the causes and consequences of these migratory movements and about their interrelationship with the process of desertification. Without specific knowledge about these issues, serious development policies in such regions are not possible. This is demonstrated by the case studies presented below. They show that out-migration provoked by increasing discrepancies between population density and economic carrying capacity may lead to implications in the source regions which would not have been anticipated by reflections based on theoretical considerations or general experiences (see also Knerr 1998 and 2000).

The problems arising from large scale migratory movements have their roots in the arid regions but - on a political, social and economic level - may bear consequences for the global human community through across-border migrations, water shortages, food deficits and social unrest. Therefore, they constitute a challenge to international co-operation to influence this process where necessary which is in the self-interest of other nations, too.

As increasing desertification is, in many arid regions all over the world, both a result of and a threat to human activities, scientific co-operation is necessary on a global scale to collect, compare and draw conclusions from experiences made. This is a central issue of the future of mankind, implying questions of food security, of social peace and of international conflicts.

In order to stimulate the discussion in this area, the author presents theories and experiences made in arid regions affected by desertification. By this, it is intended to provide a background for building up scenarios which might be used as a basis for formulating research hypotheses for individual cases.

Two phenomena are considered which in practice are difficult to disentangle with regard to which came first, but which both lead to the same result: firstly, desertification which entails an increasing discrepancy between population density and carrying capacity and hence out-migration; secondly population pressure which leads to desertification and as a consequence to out-migration. Pressure can come from both sides, from the natural environment which degrades or from the growing population which causes the degradation. Without asking for initial causalities, the paper analyses the interactions which characterise the following-up process are analysed. In this context, problems which face the MENA region are exemplified by Egypt.

## **Background**

Land degradation and desertification in drylands is one of the major challenges to food security world wide. The MENA region, including Egypt, is particularly concerned with this. Over the last decades, desertification has accelerated. Most of this is man-made, as population and increasing claims entail land degradation „...with rising income expectations and standards of living, higher agricultural yield levels are necessary. And this is why in the course of development land which has been regarded until now as fertile will become marginal land, and the previously marginal land will go out of production,, (Andrea 1977; cit. from Wolff 1993). Under these conditions, the carrying capacity of arid region declines due to both decreasing productivity and growing aspirations, and it is attractive for people to move away.

It cannot be concluded a priori that population movements which take place in reaction to increasing population pressure on a given resources' basis and/or in reaction to an erosion of the resource basis, tend to support the way to a stable equilibrium between both. They might as well contribute to a permanently unstable situation, implying a threat to the natural environment and to the people living in it. The out-come of the interactions depends on the social, political and economic framework which is set on the international, national and local level. The following case studies will provide insights into prevailing relationships.

Egypt is among the most arid countries in the world with almost 100% share of arid land in total land (WRI 1999), characterised by increasing desertification. With a population growth of almost 3% p.a. (World Bank 1999) and a share of around 47% of its labour force working in agriculture (el-Hawari 1998:70), taking care of agricultural sustainability is of vital importance for the country.

Agriculture supplies a share of 16.7% to the country's GDP which is a decline from 27.1% in 1977 (World Bank 1999). In 1998 the growth rate of agricultural production has been 2.6% , and hence lower than the growth rate of the population (World Bank 1999). The total cropland per capita of the population is only 0.05 ha, and over the last decade this figure has declined by 11.5% (WRI 2000). The World Resources Institute comments on that: „agricultural land being lost to urbanisation and windblown sands; increasing soil salinisation below Aswan High Dam; desertification; ...; other water pollution from agricultural pesticides; ...; very limited natural fresh water resources away from the Nile which is the only perennial water source; rapid growth in population overstraining natural resources.“ (WRI 2000). This situation is no exemption in the whole MENA which altogether experienced a decline of 13.7% of its total cropland over the last decade (WIR 2000). Although food production in the country has been increasing by a remarkable 72% over the last decade (WRI 2000), for many years, the growth of agricultural production, in particular food production, has lagged behind the country's population growth (Wolff 1993:103). Over the last two decades, the growth rate of agricultural production has displayed a slow but steady decline. There is not much scope for increasing the agricultural productivity much further. The possibilities for irrigation seem to meet their limits; according to the information of the World Resources Institute, 116% of the total cropland is already irrigated (WRI 2000). This gap between population growth and growth of food production can also not be closed by land reclamation in which many governments have put tremendous efforts for centuries (see Wolff 1993).

The move from the rural regions to the urban centres, in particular to Cairo and Alexandria, goes on, although the government has made attempts to stop it, by resettlement schemes and other programmes. Hence urbanisation has been steadily increasing and has reached more than 45% of the population. The question what this implies for the rural regions, from where the migrants come has not been answered sufficiently. Well known and influential theories on migration stress the advantages of such migratory movements out of strained regions as they seem to take population pressure away from them and imply a better relationship between carrying capacity and population density. However, as will be demonstrated below, out migration might not be a favourable solution for rural development.

Under these conditions, Egypt is at a critical stage, where the gap between population growth and growth of food production becomes increasingly wider, desertification pro-

ceeds, and population movements out of rural regions accelerate, with unknown outcome for the rural regions carrying capacity.

In spite of the fact that it is a century old phenomenon in Egypt which has significantly gained momentum over the last decades, and in spite of its close relationship with core political issues of the country (Toth 1999), in particular internal migration in its consequences has been insufficiently investigated. In her book about the consequences of migration on Egypt's labour market, el-Hawari states that although a widespread phenomenon with far-reaching economic and political consequences, internal migration in Egypt is not reflected in the actual literature (el-Hawari 1998:127). She, therefore, concentrates more on theoretical reflections and on international migration.

More attention is paid to international migration. It is important for Egypt's economic development, and due to its contribution to the country's inflow of foreign exchange and its relief for the labour market, has received much attention on the political level. At the same time, it has been investigated far more from the scientific side than internal migration. One reason might for this might also be that data about international migration are more easily available as they imply across-border transactions (out-migration, in-migration, bank transfers) which are registered more than internal transactions. Hence, a number of sophisticated studies about the impact of international migration exists, often concentrating on the macro-level impact of remittances (see, e.g. Farrag 1995). Investigations about the economic and demographic determinants and social implications of international migration allow some rough and indirect conclusions about the impact on the source regions (see, e.g. Adams 1993; Nasrat 1999). This contrasts sharply with the lack of knowledge about internal migration, its dimensions and consequences.

According to the traditional neo-classical theory of migration, people tend to move to where they expect to receive the highest income, taking care of aspects like transaction costs, risk and uncertainty and employment chances (Knerr 2000). As in rural regions of low-income countries income is largely determined by natural resources, spreading desertification c.p. implies an increasing gap between the income in the region of origin and the income which might be expected in other regions, and, as a consequence a rise in out-migration which takes pressure away from the source region. This in turn, implies declining population pressure in the source region, leading to a more balanced regional distribution of the population and an approximation of real incomes in both regions. Famous and influential models of migration and rural-urban development, like those of Lewis (Lewis 1954), Fei / Ranis (Ranis and Fei 1961) and Todaro (Todaro 1976) put this aspect into the centre of their analysis. In fact, large-scale migratory movements out of regions hit by desertification are observed all over the world (UNCCD 1998) lending support to the results of such theories.

Yet, reality shows that the times for peaceful settlement migration of larger numbers of people who wanted to leave their home region are over. This applies, first of all to across-border migration, but increasingly also to internal migration. As a result over the last decades of the 20th Century, migratory movements have increasingly become temporary and selective (Knerr 1998b). Hence, questions about the impact of out-migration on the source regions have to extend not only to the consequences of out-migration, but must also include those of return migration and the inflow of financial and other resources brought or sent by the migrants.

A major consequence of temporary migration patterns is the permanent interaction between the migrant and his family/household in the source region. This interaction extends to many levels of the migratory process, from the decision who will migrate and when, over the extent and use of remittances up to decisions of return. Moreover, interactions with the home community build up migration chains which promote and shape following-up migration processes.

The following case studies demonstrate a set of different consequences of out-migration which result under various socio-economic and cultural conditions.

### **Circular labour migration within the framework of traditional family / household strategies**

Strategies to cope with adverse environmental conditions have existed in arid regions since ancient times. In many regions, they have been essential for the survival population. In many locations, they continue according to established patterns, although in the present time, due to rapidly changing external conditions, i.e. desertification and population growth, they have assumed other dimensions. Adaptations take place within this given framework, often build on long-term stable adaptations to stable arid environments, such as pastoralism or patterns of regular seasonal and circular labour migration (see, e.g. Scoones 1995, Prothero 1998 ).

An example of this kind of migration are the people of Senegal. Their migratory patterns are pre-determined by historically established survival strategies which display typical differences between ethnics. This is demonstrated by Dia's detailed study of the migration strategies of the Kaskas, the Soninké, the Seres and the Haal Pular (Dia 1992). Common to them is that migration decisions are taken jointly by the social unit the migrant belongs to, and that migration/remittance strategies are pursued with the intention of supporting the existence of the reproductive unit at the place of origin.

The Kaskas live under climatic conditions which make labour demand on the farms peak over a short period. In addition, due to insecure rainfall, irrigation is essential for increasing and securing agricultural productivity. On the irrigated lands, external labour is particularly important due to the extremely narrow calendar of cultivation.

The Kaskas on the average have 1.5 out-migrants per household. Their agricultural development strategies include special forms of temporary migration which embrace mainly the younger age groups. Migration income is the most important component of non-agricultural income among the Kaskas. In 1988, each household on the average received 65.800 F CFA p.a. which is equivalent to a salary for 188 to 268 working days.

Behind this average migration situation there are important differences between household groups which have a decisive impact on the economic situation of the whole region. Three typical groups can be identified: a) households where about 75% of the men are migrants. They are able to subsidise their farms by migrants' remittances which pay for inputs and external labour. b) large production units with few migrants; in spite of large areas of land per household (74 ha on average) only an average of 2.6 ha is cultivated due to lack of external income to hire labour, buy inputs and finance irrigation parameters. Here, land productivity is low, farm households are

indebted and suffer from food deficits. c) small production units without migrants; they are the worse off. In spite of their small area of land, they are not able to satisfy their need for labour. Although they employ innovative technologies, like direct seeding etc., they are not able to compensate for the lack of labour and inputs. As a consequence of this, families with migrants accumulate large land holdings. The head of the production unit secures the farm management. The production units which have the most migrants are enlarging their irrigated area at the most, and their mechanise more than others. Yet, these farm activities are not sustainable out of their own resources. The net return of their investment is negative, and it would not be possible to finance them out of the farm income. Hence, the applied migration-remittance strategies allow the families to continue their life in their arid home region, which otherwise might not be possible.

Similar strategies are common in other ethnic groups of the population of Senegal (Dia 1992). Of the Haal Pular more than 90% of the men between 30 and 60 years of age have migrated at least once in their life. 58% of the migrants move to towns within Senegal, 35% to those in Mauritania, and 6% even further away. Households in the home villages on average consist of 1.4 men present, 2.2 women present and two absent men or women, not including the seasonal migrants. Close ties maintained within the clan support highly organised seasonal migration patterns. So, households established in Dakar take over the responsibility for young migrants arriving there.

High rates of migration are also observed among the Seres, with 48%, and the Soninké. The movements of the Seres whose tradition of migration to Dakar only dates back to the 1980s have intensified significantly with the increasing droughts in the region. As a result, the Seres are distributed over Dakar, the Terres Neuves and their home region in Central Senegal, and between these regions there are intense movements, supported by strong social networks. Decisions about migration are usually taken within the family subgroup consisting of the mother and her children, in co-ordination with the head of the farm-household unit.

The Soninké are specialised in long-distance migration. In the 1960s they had taken part in the labour force agreement between Senegal and France. In 1975, when the French government decided to stop in-migration from Africa, 83% of the out-migrated Soninké were in France. Afterwards, some illegal movement to France carried on, and in addition new international paths established themselves, in particular to Central and Western Africa. At the Soninké, the oldest who heads the social group living, cultivating and consuming together, decides on migratory movements, organises the out-migration and decides on the use of remittances. On the average such a group consists of 16 persons.

Similar strategies of maintaining the reproductive unit in the rural area by subsidising agricultural activities by migrants' remittances are common in other arid regions of Africa, as, for example, in the Communal Areas of Zimbabwe where the subsistence needs of the smallholder families can only be met due to migrants' remittances which are used to buy the necessary inputs (Hedden-Dunkhorst 1993). In addition, this is accompanied by long-term migration-cum-remittance strategies, which aim at giving the children a good school education which later on will put them into a position to earn a higher income allowing for higher remittances.

All of the described strategies can only be successful, as long as the migrants are able to find employment which provides them with a surplus to transfer to their home region. With increasing desertification, accompanied by mounting population pressure these strategies are increasingly threatened to fail. Mauritania provides an example where they definitely have collapsed (Fahem 1998). While the country's nomadic areas are emptying, urbanisation increased from 8% to 47% between 1965 and 1988. This development has been promoted by the availability of water and food supplied by international aid organisations to urban centres. Hence, many were attracted by these supplies and not by well-paid jobs. Although out-migration from rural areas is highly selective in favour of the younger males, which deprives the rural regions of their most productive labour force, hardly any resources flow back there. The gender distribution in the rural areas is significantly in favour of women, while in the urban areas it is the reverse. One third of all households in the country are headed by women. In the face of increasing desertification on the one hand and continuing high population growth on the other hand, the largest part of Mauritania's population today is threatened by hunger and thirst. For a large part of them, only international aid secures the survival.

In addition, as has been demonstrated through a study by Knerr and Schrieder (Knerr and Schrieder 2000; Schrieder and Knerr 2000), migration-cum-remittance strategies seem to support first of all those in the home region who possess productive resources. It shows that in rural regions of Cameroon, not all of those who have migrant family members are supported in case of need. The amount of remittances received is not negatively correlated with the income of the migrant's family member at home, - as would be expected under the assumption of altruism -, but positively with the number of animals and the amount of land the remittee holds, and the remitter might inherit. The example of Cameroon demonstrates that migration strategies might be more a way to preserve productive capital in a strained region, than just a strategy to maintain the living standard of those left behind. A study made by Lucas in the mid-1980s in Botswana seems to point into a similar direction (Lucas 1985; Lucas and Stark 1985).

## **Out-migration for resettlement**

Migration out of arid regions for resettlement as a rule means movement to urban centres and increasing urbanisation. In fact, in all arid countries, cities are spreading and the growth rates of the urban population are significantly higher than the average growth rate of the whole population.

When individuals or families leave for good, remittances might be sent for a shorter or longer time span to those left behind, but as a rule they tend to decline and eventually dry out. How this process develops, depends on the economic and cultural context.

Sending remittances to secure the survival of the family/household left behind is, for example, less common for internal settlement migration in the social context of Latin America. Therefore, the implications of out-migration from overpopulated regions are quite different from those described above. They are analysed by Müller (1993) for the Valle Grande in Bolivia, a smallholder region characterised by long-term net population loss, selective out-migration and no significant remittances received from those who have out-migrated. 76% of the population of Valle Grande live in rural areas where non-agricultural sources of income are largely lacking. With the applied techniques, only 10% of the province area can be cultivated by field crops. Over the past

decades the region was hit by repeated periods of drought. Desertification is accelerated by deforestation and soil erosion which is mainly due to cattle holding in unregulated pasture economies.

Between 1950 and 1992, the Valle Grande lost 20% of its population by out-migration. Out-migration is promoted by the fact that the Valle Grandinos dispose over alternatives to agriculture for gaining an income. Traditionally they are engaged in trade and transport. Under these conditions, they have concentrated less on agricultural innovations to improve their farms.

Out-migration seems to bear a negative ecological impact. It has not lead to a reduction in the number of cattle kept, but only to a stronger concentration of cattle holding. In addition, deforestation has accelerated due to a lack of labour force. As the fields weed up extremely rapidly, and herbicides are very expensive as compared to labour, it is more profitable for the farmers to burn down forest areas to gain new fields than weeding old ones. This development has resulted in increasing desertification.

In addition, out-migration has brought a permanent erosion of the region's productive human capital. The major reason is that out-migrants tend to be the younger and more productive persons, while the weaker sections of the population stay behind. As the better qualified leave, more demanding jobs cannot be filled adequately, neither in the private sector nor in the provincial administration. As this pattern has persisted over decades, social problems, like over-ageing of the population, high dependency rates, alcoholism and high suicide rates prevail.

As unfavourable areas are increasingly emptying and isolated, critical numbers of inhabitants for maintaining the public infrastructure in many places do not exist anymore, which provides further incentives for out-migration.

Declining productivity has been particularly pronounced in agriculture. For almost all crops for which Valle Grande once had an almost monopolistic standing, like maize, land productivity has fallen far beyond the average of the departamento and the country.

Out-migration hence has lead to an erosion of the physical as well as the human resources. As a result, the region suffers from a steep economic and social decline. Life expectancy is below and child mortality is above the Bolivian average. As the economic potential of the region has dramatically declined, the remaining populations finds it increasingly difficult to maintain itself.

A case of involuntarily permanent out-migration from an arid region hit by desertification is described by Randall (Randall 1998). In her study she demonstrates for the Malian Gourma that traditionally based strategies to temporarily escape from drought can end up in permanent displacement, the loss of the traditional socio-economic life style people and, as a result, accelerating degradation of the region's natural resources and desertification, if too much physical and social capital is lost. „...both those maintaining a nomadic lifestyle and those who have migrated to towns are modifying their use of natural resources in ways which are inevitably likely to increase demand and probably lead to over exploitation. The very basis of existence in the arid rural region cannot go back because no more resources are available.,, (Randall 1998:172). The loss of herds is the key to this development. „Unfortunately, human



exploitation is probably less controlled than animal numbers and poverty is leading both rural and peri-urban populations to depend more and more on the only 'free' resources around" (Randall 1998:172).

An important but largely neglected aspect to consider when asking for the impact of out-migration on the carrying capacity of arid regions is the fact that the maintenance of irrigation systems often requires a certain social organisation of the population in the region. When this social organisation is disturbed, such systems tend to collapse, and, as a consequence, desertification accelerates. Such a situation is described, e.g. by Amini for desert border regions of Iran, where the flight from the countryside and the depopulation of numerous villages entailed a drop in the number of ecologically very important „qanat,, irrigation systems, and their replacement by deep wells, all of which led to the desertification of wide areas (Amini 1999).

### International migration: a special case

Strategies of labour export from arid regions are also pursued on a large scale at the international level, often actively supported by governments. Arid countries are among the world's major labour exporting countries, and it is a striking fact that those arid countries which are not in a position to earn a significant amount of their foreign exchange by oil exports are labour exporters<sup>3</sup>. In these countries, remittances are so high that they have a significant, and in many cases a dominant, influence on the macro-economic development of the whole country<sup>4</sup>. In 1998, Egypt received an amount of US\$ 4.360 bio. and in 1997 US\$ 4.528 bio. as workers' remittances, which is equal to a per capita receipt of US\$ 71.0, resp. 75.14 per capita of the population<sup>5</sup>.

This amounts to more than 10% of the country's GDP and about 25% of its export earnings in 1998. These official figures still underestimate the total amount of remittances coming into the country, as much of the money earned abroad is sent back or brought back through informal channels. According to estimates by Adams for the period 1985 to 1986, almost one-third of the total remittances entered the country without being registered officially (Adams 1991). In spite of its still high significance for Egypt's economy, remittances have been declining. Ten years before, in 1987, they still amounted to US\$ 9.807 bio.

For the households involved in international migration to high income industrialised and/or capital rich countries, like the U.S., Saudi Arabia or France, the monetary gain from migration is so large that their reactions and the consequences resulting from this differ significantly from those of intra-national migration or migration to poor neighbouring countries. Therefore, this form of migration requires separate consideration.

Most often, international migration is so profitable for the households that remittances exceed all other sources of income. Against that background, it is not unusual for regions of international out-migration that agricultural productivity declines because a large part of the younger male labour force is absent for a longer span of time, and

<sup>3</sup> Labour exporting countries are defined as those who receive more than 50% of their foreign exchange through migrants' remittances (Knerr 1998b).

<sup>4</sup> For details see Knerr 1998b

<sup>5</sup> Calculated with data from the World Bank (World Bank 2000). Remittances can be calculated there as the category „net current transfers from abroad“.

remittances are hardly spent on productive farm investment. Striking examples to this are Yemen (Knerr 1998b), the Mexican province of Zacatécas (Moctezuma 1999), and Pakistan (Knerr 1998b, Batzlen 2000). Typical investment categories are houses, furniture and vehicles, and in some regions, as, e.g. Pakistan, the marriage of the migrant himself, his brothers and sisters (Batzlen 2000). The last investment category might be quite rational from the individual point of view as it provides a social safety net which might be helpful in adverse situations in a hostile environment. A similar pattern has been observed by Reichert in his case study on six Egyptian villages, where the major specific motivations and goals of international migrants were building or rebuilding a house and marriage (Reichert 1993).

## Conclusions

The above analysis demonstrates that predicting the impact of migratory movements from and within arid regions by applying the results of theoretical models may be misleading. It demonstrates that for rational reasons migration strategies might be chosen which further accelerate desertification and the erosion of the natural resources.

Against the background of an urgent need for information on which policy action can be based, it is strongly recommended that results obtained from case studies are immediately fed back into the political discussion process, both on the national and on the international level. Development policies which do not take these experiences into consideration might lead to unexpected and undesired results. The existing interactions between desertification and migration, combined with a lack of knowledge, call for co-operation on the scientific as well as on the political level.

There is an urgent need for research about internal migration in Egypt, its dimensions, causes and consequences. Within this context, making use of experiences made and results obtained by joining international scientific co-operation are essential. In return, further investigations in Egypt could provide valuable information for other arid regions faced by similar problems.

International co-operation might also include technical and financial support by the population of those states which are economically and ecologically better off, but which are equally negatively effected in their well-being when desertification proceeds world-wide, and migratory movements extend to refugee movements of those who are no longer able to make a living in their arid home region.

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