LINKING RELIEF, REHABILITATION AND DEVELOPMENT PROGRAMME (LRRD) IN AFGHANISTAN

ASSESSMENT POST CRISIS & PROSPECTS
OF URBAN AGRICULTURE IN KABUL
What place is there for agriculture in the rebuilding of a city?
Case study of Kabul

2006

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1 Introduction

Since 1978, Afghanistan has been severely affected by conflict and crises. The country was marked by the Jihad from 1979 onwards, and then by a civil war from 1989, which was particularly destructive in Kabul, the capital, from 1992 onwards. The Taliban took over power in Kabul in 1996. After nearly 25 years of war, Afghanistan is a country that has been drained of its resources and where everything needs to be rebuilt. From these years of conflict and occupation, the agricultural sector has been considerably weakened: most of the irrigation systems and orchards have been destroyed and livestock has been reduced by a third. Moreover agriculture has also been severely affected by a country-wide drought (1999 to 2001).

In 2001, the city of Kabul was liberated and control passed into the hands of the international community. At this time, Kabul counted 700,000 inhabitants[1] and subsequently experienced one of the world's greatest return movements of refugees (Grinnell, 2004). According to the CSO[2], roughly three million people fled the countryside to take refuge in the cities (mainly in Kabul). The city then experienced an annual demographic growth rate of 17% (Schütte, 2006). Today its population is estimated at 3.5 million[3].

The city was not prepared to accommodate such a large influx of people. With a population density of 10,000 ihts/km² (AISA, 2004), housing has become one of the principal concerns for the Kabulis. Rent soared by 280% (Grace, 2003), unoccupied land became extremely scarce and reached exorbitant prices. The city continued to expand, newcomers were obliged to settle wherever they could, building houses and establishing informal settlements on the hills and at the bottom of the mountains (cf. Figure 1).

Figure 1: View of the South of Kabul (April 2006)

Source: C. Laillet

Infrastructure is insufficient at every level. In the schools, pupils from different grades attend classes in the same room. The population grows in an exponential way, yet the same cannot be said for the city's infrastructure. The only existing urbanisation plan dates from 1978 and

[1] UN data
[2] Central Statistical Office
[3] This figure is an estimate since no census has been made since refugees return.

is completely obsolete, as it was drawn up on the basis of half million inhabitants. Thus urban expansion continues in a completely uncontrolled manner, without any distinction between agricultural land and urban land. Building sites are encroaching on arable land, which, because of the topography, cannot simply be moved elsewhere, given that Kabul is built in a basin surrounded by mountains. For agriculture, the pressure on land just keeps on increasing.

In addition to the problem of space, the question of water access has become crucial in the capital. In this high altitude (1750m) basin city with an arid[4] climate, water resources are limited: rainfall in Afghanistan is mainly made up of snowfall, the rivers and the aquifers are recharged during the snow melt months. This resource is used for urban needs but also for agricultural activities (irrigation). In this over-populated and unhealthy city, access to drinking water is also problematic (each summer, cholera cases are detected). Water is contaminated and the water table is dropping, leading to an overexploitation of groundwater. Today in Kabul, the quantity of pumped water is higher than the natural capacity of the aquifer annual refill. Between domestic and agricultural use, the question of water distribution has become crucial and a source of conflict.

In Afghanistan (in 173 position on the United Nations classification based on the HDI[5]), the national economy is still strongly dependent on agriculture which contributes for more than the half of the GNP[6] and employs two thirds of the country's workforce (World Bank, 2006). Developing Afghan agriculture is one of the country's global development keys.

Cultivated land in Kabul today is reduced to two thirds of the surface area before the wars due to fighting, mines and drought. Over the same period, the population has increased eightfold.

In this context, how can agriculture be maintained and contribute to feed a population in perpetual growth? How has the agricultural sector changed over 23 years of crisis and what coping strategies have farmers adopted? During the past five years of relative stability, what opportunities have been taken to promote further development in a city undergoing rapid demographic expansion? How is the sector coping with the major constraints of land pressure and overexploitation of water resources? What role is there for urban agriculture in a city which has the strongest demographic growth rate in the world[7] (International Mail, 2005)?

These questions lie at the heart of the Linking Relief Rehabilitation and Development (LRRD)[8] programme which is being implemented by Groupe URD[9]. The LRRD programme aims to develop a better understanding of the various facets of Afghan rebuilding process in order to improve the quality of relief and development projects. Agrarian system analyses have been carried out in various contexts within the LRRD programme in partnership with NGOs. The particular case study was carried out in partnership with GERES[10] which is looking to improve knowledge about urban agriculture. It is currently implementing several projects looking at the possibilities of growing crops in greenhouses in Kabul.

The agrarian systems analysis carried out for this case study mainly focuses on the recent history of Kabul, since the beginning of the war (1979) and will particularly look at urban

[4] Aridity can be defined as a structural rain deficit over part of the year.
[5] Human Development Index. Afghanistan is ranked 173 in the Human Development Index out of a total of 174 countries (2006).
[6] Gross National Product
[7] From 2003 to 2015, previsions indicate that the Kabul population will increase from 3 million to 5.4 million, i.e. an increase of 81.5%.
[8] The Linking Relief Rehabilitation and Development programme, funded by the European Commission is presented in Chapter 1 of this report.
[9] French NGO, Groupe Urgence Réhabilitation Développement (Groupe URD)
[10] Groupement Environnement Solidarité et Energies Renouvelables

agriculture (horticulture), which is defined by geographical criteria but also by its particular links with the city and its inhabitants.

Having introduced the context in which this work was carried out, we will present the concepts and reasoning adopted to study these issues. In the second part, we will define the zone of study and will examine the strategies adopted by Kabuli farmers during the periods that have most marked Kabul's history before looking at the current situation of urban agriculture.

The last chapter will be devoted to a discussion about the role and the future of urban agriculture in this context where demographic pressure, land pressure, urban development and the competition for water is set to increase rather than diminish.

2 Working frame

2.1 GERES and its greenhouse projects

GERES, Renewable Energies, Environment and Solidarity Group, is a French NG0 that was founded in 1976. GERES works in France and abroad on problems related to energy in the construction industry, the environment and in agriculture. It has been present in Afghanistan since 2002 in the field of "solar" construction and rural development with the construction of verandas, potato cellars and greenhouses. In Kabul, GERES has been running greenhouse projects for two years.

A greenhouse enables families to grow vegetables and generate a complementary income

Since 2004, GERES has built ten greenhouses for vulnerable households. This year a new project focusing on access to vegetables in winter and income generation financed by the European Commission has been launched (cf. Annexe 3). The construction of about thirty greenhouses is envisaged in the three poorest districts of Kabul. A dozen greenhouses will be built this year and the remainder the next year. Beneficiary selection is based on technical criteria (wealth, land possession and whether land is south-facing or north-facing) but also on whether people have a basic preliminary knowledge in agriculture. Kabura, an Afghan NGO, monitors the greenhouse crops for a two-year period. Training is provided to men and women. As well as addressing technical aspects, they also aim to teach household members about the importance of nutrition.

This project must be accompanied by marketing support, either by encouraging shopkeepers to sell the products grown in greenhouses or by accompanying the beneficiaries in setting up their own selling outlet.

Through this research study, GERES hopes to obtain a better understanding of the Kabuli agricultural context and fragile zones, as an indicator of which areas would most benefit from greenhouses.

An economic analysis of farming systems will help identify which crops are most advantageous. The identification of the flower production chain on the one hand and the marketing of seedlings, flowers and vegetables on the other will shed light on the crop rotation system and the farming calendar. This in turn will help project managers to advise the greenhouses beneficiaries and direct them towards technically feasible and marketable crops.

This study also aims to build knowledge on post-crisis urban agriculture in order to formulate advice and proposals for greenhouse implementation and crop management.

2.2 Conceptual base

Before commencing this review, we shall present some key concepts which will enable us to establish a conceptual base for our study around which our questions on Kabul agriculture shall be structured.

2.2.1 Agrarian assessment

The agrarian assessment consists of studying agrarian systems. Mazoyer (1985, quoted by Healy, 1995) defines **an agrarian system** as "*a farming system that has developed over time, that is adapted to bioclimatic conditions of a specific area and that responds to the conditions and social needs of the time*". According to Jouve (1987, quoted by Healy, 1995), this system is characterised by two elements: natural environment and social environment.

The agrarian assessment makes it possible to study concrete farming situations and why they have developed as they have, thanks to **a systemic analysis.** We will use the systemic approach in which "*a system is a synthetic representation of a complex unity, which functions on the relations established between the different components of this unity*" (Jouve, 1992).

An assessment makes it possible to understand what are the real conditions that determine agricultural production. It is a "*judgement passed in a short time on a state or a situation*" (Jouve, 1992). This approach is based on a succession of stages moving from the general to the particular (Bainville, 2002), from the city to the plot of land.

In this report, we will only cover one part of the agrarian assessment, the spatio-temporal study, which is where the assessment begins.

2.2.2 Urban space

The city

We will use the definition of Coquery-Vidrovitch (1985)[11], who describes a city as "*a centre of dense human settlement and cultural diffusion. Its existence is determined by specific economic and political conditions for the organisation of production systems and trade whereby a surplus of agricultural production feeds a non-farming community*". But as Fall & Moustier (2004) specify, "*a city, however dense, is not a continuum of contiguous built spaces. The urban envelope includes a certain number of external urban spaces and non urban interior spaces*". Thus the city and urban spaces are not restricted to the simple inhabited space. We will therefore be interested in these non urban interior spaces.

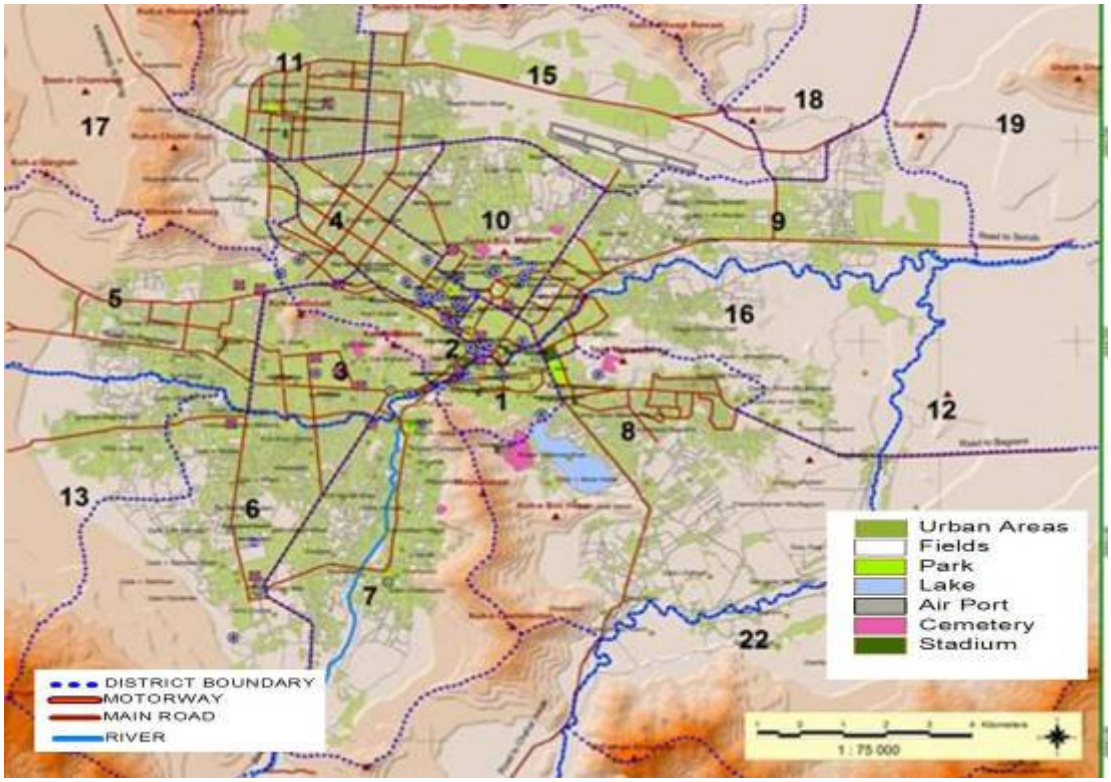
It is however not easy to clearly dissociate the external limits of the city. These limits are often vague and almost systematically evolving. There is always a transitional space where the influence of the city is still strong but where the space is less densely built up.

The official limits for Kabul city, determined by the municipality under the Soviet regime, were limited until recently to the town centre. For almost thirty years, the expansion of urban space extension has not been recognised or taken into account in the city management. Today, Kabul's city limits have increased and include these new spaces, which are now recognised by the Ministry of Urban Development (MUD).

In the case of Kabul, to establish where the limits lie in the transition from urban to rural, we initially based our assessment on topography: mountains which form a natural barrier between the city and rural areas (cf. Figure 2: Map of Kabul). Initially, population density, the proportion of built-up areas, land prices or the distance from the town centre did not appear to be the most relevant criteria in the case of Kabul. The Ministry of Urban Development's strategic maps to which we had access later confirmed our choice of city delimitation (cf. Annexe 4).

[11] Quoted in Fall, 2004

Figure 2: Map of Kabul



The recent recognition of the "wider" city explains why the Kabuli territory includes areas which are still now named villages.

We distinguish well urban space, which belongs to the city and which depends on its management, to the peri-urban space which is much vaster and, even if it strongly depends on the city, remains a separate entity.

Urban agriculture

The geographical space covered in this study is limited to the natural barrier created by the mountains. On the other hand, the geographical criteria used to define Urban Agriculture (UA), as agriculture practised in the city, is discarded because it seems too vague. Indeed, we shall complete this definition.

Moustier and Mbaye (1999)[12] indicate that in UA "*there is an alternative between agricultural and urban non-agricultural use of resources*", where "*the alternative opens up competition, but also the complementarity of the different use of resources:*
– Building land and farming land;
– Water destined for use in the city and water for irrigation;
– Non-agricultural work and agricultural work;
– Domestic and industrial waste and agricultural inputs;
– Coexistence in the town of a multiplicity of know-how due to migration, cohabitation of agricultural and urban activities generating negative aspects (theft, disturbance) and positive aspects (parks)." Moreover, in UA, production is influenced by the proximity of the market and urban demand (Maxwell and Armar-Klemesu, 1998)[13].

Thus, we shall retain that the areas of which UA is composed have agricultural activities of which the entire production or some of it is intended for the urban market (which is not

[12] Quoted in Fall, 2004
[13] Quoted in Fall, 2004

exclusively subsistence). This agricultural sector makes use of employs factors of production (land, water, labour, inputs) which could also be used for non agricultural ends and is influenced by urban policies.

In the case of Kabul, only farmers undertaking horticultural production (fruit, flowers or vegetables) correspond to the above definition of UA. It is therefore this type of farming production that will be the subject of analysis of the current agrarian system of Kabul.

2.2.3 The land

Division of land under Islam

The division of land for inheritance purposes is based on Islamic principles: two thirds for sons and one third for girls. So for each generation, the amount of land at their disposal is reduced. At present in Kabul, it is impossible to find new land to increase farming production.

In reality, women do not really inherit of land, although they can rent out this land or hand them over to their husband. They generally leave their share to their brothers. Due to demographic growth and the rise in population density, land is being increasingly divided into smaller and smaller plots, some of which have become too small to really be productive.

Land pressure

Land pressure is defined by farming population density in relation to the quantity of useful agricultural land[14]. The increase in land pressure is both the result of the traditional system of land division and the impossibility of finding new land (because of the population increase). This pressure seems to have brought about a major turning point in agrarian systems. We will be interested in the theses of Malthus and Boserup who analysed the influence of the land pressure on the way agrarian systems were evolving, one announcing the decline of agriculture, the other its innovation.

- *The Malthusian model*

Malthus exposes in his *Essay on the population principle* (1798)[15], that the increase in rural population involves a rise in pressure on resources, in particular on land whose fertility is decreased. Follows from there a reduction in crops yields and thus a drop in the available agricultural production. Eventually, this may result in famine, the elimination of a part of the population and a balance between the population size and production capacity of the considered area is restored. The new-Malthusians indicate that exodus replaces famine when there is too great an imbalance between the production capacity and the needs of those who live in this space.

- *The Boserup model*

This Malthusian thesis omits the agricultural capacity of innovation which Boserup refers to in her *Agrarian evolution and demographic pressure*, 1970[16]. She maintains that demographic pressure can be a driving force promoting change in agrarian society. Thus, an increase in rural population is a favourable factor to agricultural intensification in under-developed countries.

Boserup's thesis enables us to introduce the concept of intensification. In rural economy, agricultural intensification is defined by the investment in work and/or capital per cultivated unit of land. This intensification can appear by an increase in yields or added value. In this logic of intensification, Boserup notices that livestock tends to diminish, so, intensification is often accompanied by specialisation, i.e. orientation towards a type of crop, for example, the transition from a mix of arable and livestock breeding to market gardening.

[14] The useful agricultural surface defines the land quantity useful for agricultural production activities.
[15] Quoted in Jouve, 2004
[16] Quoted in Ellison, 2003

In Kabul, both two situations can be observed and the various factors which generated either a tendency for decline or innovation will be studied later. However, these two theories need to be adapted as they refer to rural contexts. It is interesting to replace them in the urban environment, which differs considerably in terms of access to food and to employment.

2.2.4 Water in Afghanistan

An Afghan proverb says: "*It is better Kabul without gold than Kabul without snow*".

Irrigation forms an important part of Afghan production systems. In this mountainous country, water from the mountains is collected for irrigation. Water for gravitational irrigation comes from various sources supplied by the snow melt. The most common irrigation form is from river water. This water is brought by canals which sometimes originate several kilometres upstream so that water can reach the plots by gravity. Traditionally, the management of these canals is community-based. A *Mirab*[17] is chosen by the users of these canals. He organises water distribution in a rota. The quantity of water received is proportional to the amount of land. The water rota varies according to the season. Whereas at the beginning of spring, when the river is often full, access to water is sometimes free. However, the amount of time the canal stays open decreases or the days of irrigation are more spaced out as the amount of available water drops. The *Mirab* is also responsible for canal maintenance. They ensure that each farmer participates in the cleaning out process, which is takes place at least once a year.

The *karez* is a water collecting system which dates from at least 3,000 years ago. They are subsoil water canals, dug into the mountain to convey water to the irrigation networks. In the same way water distribution coming from the *karez* is organised into a water rota. The tunnels which carry out water to the reservoir must be cleaned each year. This work is a burden for the community as a team of people has to go underground via the exit mouths to remove the deposits brought down by the mountains water. The drawing up of subsoil water for a superficial water table is done from *a harat* which is a well, broad in diameter and between 4-8m deep. Water was traditionally extracted thanks to a horse-powered system turning around this well. At present horses have been replaced by water pumps. For a deeper water table, sinking is carried out to draw out deep water.

2.2.5 Family-run farms

A family-run farm is characterised by a farming system which is at the same time a production unit, a consumption unit but also a social, ecological and cultural unit. It is an organisation in which the budget and the family accounts and the farming accounts are inextricably linked. Dufumier (2004) adds that family-based farm is "*a farm in which the labour force used for the implementation of the production system is essentially organised by the head of the family. It is in the best interest of those in charge of family farms to adopt production systems which enable them to make their own family labour force the most profitable, in comparison with alternative incomes presented by other branches of industry*".

A family-run farm is the most common farming organisation in the world and particularly in developing countries. Kabul is no exception.

We also notice that for family-run farms, the objective is not necessarily to make profit but to ensure that there is enough food for the family and that the family is capable of retaining its asset in the long term and passing it on to future generations.

[17] *Mirab* means literally: head of water

2.3 Methodology for the spatio-temporal study

2.3.1 Reasoning

Immersion phase

The first phase of our work involved getting a better understanding of Kabul and its geographical environment. Given that GERES and Groupe URD had not yet carried out any research on Kabul agriculture and my translator, Mr Mohamed Ali Muradi, was not well informed about the agricultural areas in Kabul, an exploratory phase was carried out travelling throughout the city and the outskirts, basing our investigation on topographic maps.

Indeed, the agricultural areas are scattered and often hidden by buildings along the roads and cartographic and satellite support material was extremely useful. This also enabled us to save time in our movements in Kabul, which can be characterised by its urban sprawl (970,200 ha) and highly saturated traffic circulation.

It is important to note that these tools were used as indicators only. Currently, the AIMS[18] paper map[19] data dates from 2004 and the satellite images[20] from 2005. The information relating to agriculture that is contained in these maps is no longer relevant as the city is changing so rapidly. The difference between the cartographic data and the reality on the ground merely heightened our awareness of the fast regression of agriculture in Kabul.

As previously mentioned, Kabul is surrounded by mountains. When we move away from the city on the major roads, the landscape is quite different. In the east, there are large expanses of desert. In the south, the Logar plain, and in the West and North West, the plain of Shamali, are peri-urban areas where farming produce is partly destined for Kabul market. In fact other agrarian systems are the subject of further research[21]. In this way, we distinguish Kabul agriculture from farms located in the remote suburbs.

Initial assessment of the landscape on two levels

The initial assessment of the landscape is used to distinguish various areas and identify the main homogeneous sites (Bainville, 2002). This gives us a first idea of how the environment is organised since the landscape is regarded as "*the expression of permanent interaction on the interface between the biophysical environment and social dynamics*" (Rossi, 2000).

Informal discussions with farmers about how they organise their farming system enabled us to complement this reading of the landscape.

Following the first zoning, we realized that not all Kabul agriculture was UA (cf. section 2.2); some farming practices were for subsistence purposes. It was therefore decided to carry out a second zoning, clearly defining the areas that could be described as UA. This second zoning will enable us to carry out a more in-depth study.

2.3.1 Reconstitution of recent Kabul History

Interest and aims

A spatial study alone is not enough for understanding the current landscape. It is easier to judge the functioning of a system by considering its evolution over the time (Jouve, 1994). Thus looking at an area's history helps us to understand the current situation and to assess how the future may develop.

[18] Afghanistan Information Management Service, depending on United Nations Organisation
[19] AIMS information isn't correct; localities are sometimes in the wrong place.
[20] *Google Earth* maps on earth.google.com
[21] Studies done by ICARDA, FAO and study under way by AFD (French development agency)

We will try to reconstitute how agrarian dynamics have evolved since the Afghan war of 1979; the object of this study being recent strategies, since a city undergoes significant changes in a crisis situation, in terms of population and means of production.

This historical study aims at highlighting the different strategies adopted as a result of increased land pressure and water deficit. Starting from the hypothesis that horticulture is appropriate in contexts where land is scarce, we shall try to understand why it is not currently more widespread in Kabul.

The UA limits having changed with the time; we will make a historical study on the whole territory of Kabul, as defined in section 2.2.

2.3.2 Kabul working context

A favourable reception

Afghan hospitality is no myth: people always made time available to receive us. The fact that our study was not a government initiative nor one commissioned by an NGO already working in their area meant that people were more forthcoming with their criticisms.

The study also benefited highly from the continuity of the same translator, Mr Mohamed Ali Muradi. It means that we were able to build a relationship built on trust; he understood our work and the type of information we were looking for. His outlook on the situation also contributed to an interesting exchange of impressions, remarks and points of view.

Rare and not very accessible information

Whereas Afghanistan has been the subject of many studies over these last years, Kabul agriculture has been overlooked. The Ministry of Agriculture does not have any data about UA and arable land is generally not recognised in the cities. Because of the extremely rapid evolution of agriculture and of the city dynamics, it is only possible to base our research on recent figures. During the 25 years of war, there was little data collected and few studies or maps were produced.

Working in urban environments requires a different approach to rural areas. It is more difficult to access the agricultural landscape and actors. UA is often hidden, taking place in enclosed spaces, in a relatively unnatural environment. In the same way, as the farming population is in the minority, it is not always simple to identify them or even estimate their numbers.

It is also difficult to meet the owners who are not working the land as they often live abroad or are not present during the day. In the same way, farmers carrying out different economic activities are only present in the evenings. The anonymity of the city does not facilitate meeting farmers who are no longer active or who have changed professions. We consequently based our work only on the experiences of farmers still in activity.

Before presenting the study results, it is necessary to present some of the different scenarios. Some features have necessarily been summarised and details omitted in the interest of simplicity.

3 From subsistence crops to marketable crops

3.1 Kabul and urban agriculture zoning

3.1.1 First zoning: Kabul agriculture

In Kabul, three main types of agricultural zones can be differentiated according to the type of crop. The first is made up of annual crops, mainly subsistence, and of fallow; the second is characterised by a dominance of market gardening, whereas the third is mainly dedicated to perennial crops. There is however a fourth zone, *a priori* invisible, where flowers are produced inside the houses.

We also noticed that these different types of crops vary according to the presence and distance to the river or the wells and the density of buildings in the zone.

This highlights the importance of determining factors such as water supply and urban density (and thus land pressure).

The biophysical environment

- *The climate*

The climate is continental and dry, with an average 316mm of rainfall per year (Favre, 2004). Rainfall is concentrated from November to May, the remaining five months are dry and the water deficit is very high in summer (cf. Annexe 6). Apart from the three winter months, the potential evapotranspiration (PET)[22] is very significant; it is lower than rainfall from May to October. During this period, crops require an external contribution of water because although rainfall is concentrated at the beginning of the crop cycle, it is insufficient[23]. The average number of hours of sunlight is 6h per day from February to December and more than 10 hours per day for the rest of the year (Ezatullah, 1977).

The seasons can be distinguished between a cold winter and a hot summer. Average temperatures range from -2°C to + 25°C.

The conditions for growing crops (temperature and sun) are excellent in summer, except for water deficit which is offset by the irrigation. This favourable climate makes it possible to grow two cereal crops per year (e.g. wheat/maize). These crops cannot be sown too early because of late frosts.

- *Topography and pedology*

Kabul lies in a valley surrounded by mountains made up of metamorphic rocks. The agricultural areas are mainly located in the plane. Terraces are arranged to improve the steeper areas. Thus the absence of slopes allows irrigation by immersion, with an even distribution of water over the entire plot.

The soils are clay-based and therefore retain water (have a low infiltration coefficient) and nutritive substances (high capacity of cat ion exchange for clay). Although these soils are "heavy", i.e. hard to work, they are appreciated here because they are adapted to the irrigation by immersion and do not present the problems of water clogging that can be found in areas with more abundant rainfall. They have a good capacity for holding moisture. The majority of farmers are satisfied with the quality of the soil, which they find good and deep. Some problems of salinity resulting from the mode of irrigation do occur but this does not seem to overly affect yields.

[22] Evapotranspiration: water loss (evaporation) of green plants by transpiration
[23] Even so, it is possible to grow rain wheat, with low yields.

- *The river network*

Kabul city is part of the catchment basin of the Kabul River; there are four principal aquifers with depths varying from 6 to more than 60 meters, according to the area.

Kabul is served mainly by three rivers: the Logar river in the south east, the Kabul river in the south west and the Paghman river in the west. The Logar river and the Paghman river are tributaries of the Kabul River which itself flows into the Indus. The river flow drops severely at the end of snow melt period; during the summer, some of the rivers are practically dry.

According to the period of water availability from the rivers, different crops are grown. Crops requiring little water, such as wheat, will be privileged in a zone where water is accessible only at the beginning of season. Fodder crops, such as alfalfa, will need a little more water and thus is grown in areas where the river is fuller for longer. Lastly, where water is available all year round, more fragile crops, such as market gardening or floriculture, are possible.

- *Geology*

The subsoil is of mixed origin, formed of colluvial and alluvial contributions. It is possible to dig down deep into this type of soil. However, in the east of Kabul, some deep grit layers make well digging impossible. The topsoil is hydromorphic[24], rich in clay, which results in a heavy, sticky soil which retains water and nutritive substances.

Even though topography and temperature do not appear to be determining factors, water availability (the hydrographic network, depth of the water table and the soil nature) has a significant influence on production types.

Human occupation

Kabul is large and built-up areas constitute the major part of this city. Between houses, small production areas made up of small plots can be observed, where mainly vegetables and flowers are grown. As one approaches the built-up areas and the main roads, the division of plots intensifies and the size of the plots decreases.

Distinguishing between these different areas can be done according to two gradients: water availability and degree of urbanisation (land pressure). These two factors determine the orientation towards subsistence agriculture or commercial agriculture. Basically speaking, this results in two main zones of production in Kabul:

- Zone 1: Peri-urban areas - traditional food agriculture

This zone comprises plots of land in the city outskirts, far away from the transport network. Access to water is limited and farms have been established for a long time. The principal crops are cereals, fodder and a little livestock breeding. This zone is comprised of subsistence farming. The people who farm this land are primarily landowners.

- Zone 2: Irrigated mixed type of urban agriculture

This type of farming can be found in the centre and in the city suburbs, in places where water is available. At the same time, we can find subsistence and commercial crops (fruit, vine, flowers and vegetables) and possibly breeding.

This first zoning (cf. Annexe 7: Zoning of Kabul) gives us an overall idea of the type of agriculture in Kabul. These zones do not correspond to the definition of UA we gave, so we have chosen carry out a second zoning, indexing only UA, to have a more precise understanding.

[24] Soil which undergoes a temporary hydrous clogging and which presents an impermeable layer at low depth.

3.1.1 Second zoning: Urban agriculture

Delimitation

Based on the UA definition: "*production is influenced by the proximity to the market and by urban demand*", we exclude subsistence agriculture (zone 1) since all the production is destined for self consumption.
We also exclude part of zone 2, where commercial crops are not intended for the city, such as in Tara Khel (NE) where grapes are sold on the Pakistani market. This type of production is an adaptation to the lack of water and not to urban demand. Parts of zone 2, such as Hood Khel (E), are not included in the definition of UA. There, the little surplus is sold on the local market, the proportion of commercial crops does not vary with an increase in demand, the city waste is not used and the demand for building land results only from the natural village growth.

For all the other parts of zone 2, alternatives (complementarity and trade) exist between agricultural use and urban use. Arable land is sometimes transformed into building land, industrial areas, parks or roads. The water that is used for irrigation is also sought after by the city inhabitants: water from underground sources is used for drinking and river water is used for other domestic purposes. In the same way, family labour can also be directed towards other branches of industry and daily agricultural labour is not specialised and is capable of carrying out other tasks.

Distinguishing characteristics

The UA zones are characterised by their degree of specialisation[25] depending on:

- Land pressure

The most specialised areas (high added value vegetables and flowers) are those closest to the town centre; they are also the zones where the rent is the highest.

- Mode of access to water and duration of availability

The later in the production season water is available (end of summer), an increasing proportion of production will specialise in commercial crops. However the cost of access to water may temper this tendency. If irrigation water is taken from the canal, its cost is null[26]; yet if water is extracted from the subsoil by pumping, then the irrigation has a cost, all the more expensive if the source is at a distance. Thus, the profits earned from selling these water demanding crops must be higher than the additional cost of watering. It often appears that producers who have deep wells tend to specialise in horticultural crops to a lesser extent than producers with less deep wells.

So the cost of land exploitation, water use and accessible quantity of water determine the diversity within the different UA zones.

[25] By specialisation, we understand here horticultural commercial crops.
[26] Indeed, cleaning canals roughly requires the same amount of work whether farmers receive water one month or six months.

4 Evolution of Kabul agriculture from the communism regime to today

4.1 Kabul, a garden city, open to the world

During the Cold War, Kabul received funds from the two blocks, enabling it to finance rebuilding projects and to improve infrastructure. Between 1956 and 1975, the Afghan capital underwent a process of modernisation subsidised by the World Bank[27]. Universities, hospitals and roads connecting the city to the other great urban centres in the country were built at this time (Levron, 2006). This city which was then open to the world had a tourist industry; its universities were among the best in the region. It is estimated that 66% of industrial production was concentrated in Kabul (Kazimee, 1986). The Kabuli inhabitants adopted a "Western" and urban style of living: the first Marks & Spencer[28] of Central Asia was established in Kabul.

Figure 3: Kabul street in the 1970s

Source: www.iacboston.org

At this time, the modern Kabul contrasted with the rest of the country, which was very rural and where 85% of the population was farmers. Population density was low and farming succeeded in feeding the population. Crops, especially apricots and dried fruit, were exported and represented two thirds of the national income (National Atlas, 1984).

Kabul, which was significantly smaller than today, bore little resemblance with this dusty, dirty, over-populated city that we know today. It was planted with trees and was relatively green. Kabul was in its hour of glory. Gardens occupied a significant space in people's houses (Kazimee, 1986). For the Afghan population, the garden has symbolic importance as well as its function of feeding its inhabitants, inspired by the Koran[29]. Flowers are greatly appreciated by Afghans and farmers have long specialised in the production of flowers in the form of seedlings or cut flowers.

The city was surrounded by a belt green, made up of subsistence agriculture and orchards. This zone generated a small surplus which was sold in the bazaar. This family-run and irrigated farming was based on wheat, dry beans and potatoes for the household, but also of

[27] Maiwandi, 2002
[28] www.southasianmedia.net/profile/afghanistan/civilizations_afghnistan.cfm
[29] Islamic gardens are places of contemplation and pleasure (Pordany-Horvath, 2004).

barley, maize, alfalfa and clover for animal fodder. Families had a small number of animals: poultry, goats or sheep, one or two oxen for work in the fields, an ass or a horse for transport (and to draw water from the *harat* if they have one). Work was covered by the family labour force. Fertilisation was ensured by animal manure and human waste collected in the city but also by allowing *Kuchi*[30] cattle to graze on the field after the harvest. The *Kuchi,* nomad breeders, came to exchange meat products, milk, wool, animal manure and work against fodder and goods. An agropastoral complementarity existed between nomads and farmers who were thus able to fertilize their plots and find labour for harvesting.

Farming plots were not specialised in marketable outputs. Vegetables were grown in gardens on a small scale as in traditional Afghan food, vegetables are only used as condiments. The staple diet is based on wheat, which is used to make bread, and rice, which is sometimes accompanied by meat and tea (Duchet, 2006).

Part of the urban demand was satisfied by the solidarity networks that exist between farmers in the outskirts and their family living in the city; the remainder came from the broader periphery of Kabul (cf. Annexe 8), or, from more distant provinces since road networks were built. At this time, Kabul had less than 750,000 inhabitants (Magnaldi, 2004) and demand on the markets is not comparable with the current demand.

4.1.1 From the communist regime installation to the Russian withdrawal (1978-1989)

From 1926 to 1973, the country was under monarchical rule and then with Zaher Shah a process of democratisation took place. In 1973, Daoud carried out a “coup d’Etat” and set up a republic, of which he was elected president in 1977. He was overthrown a few months later by Taraki, leader of Khalq, the democratic party of the Afghan people, pro communist and pro Soviet.

A friendship treaty linked the USSR[31] to Afghanistan. After the communist coup d'etat, rural inhabitants increasingly voiced their discontent with the image conveyed by city-dwellers and intellectuals who directed and planned their lives. Protest movements took place throughout the country and the countryside regions started an uprising. Thus the Taraki democracy ended one year later, in December 1989, with the entry of the Red Army into Afghan territory and a few days later by the installation of Karmal[32].

This Russian intrusion pushed many Afghans to get involved as *Mujahideens*[33] in the fight against the communist occupying forces. Many Muslims from other countries joined this movement and the war transformed into *a Jihad*[34]*.*

Departure of the Kabulis and arrival of rural communities

The richer Kabulis and intellectuals left the city and the foreign occupiers behind. Southwestern Kabul was on the frontline, and farmers ceased all its activities in this area. Some survived on their savings, others changed district or migrate towards other cities to find work. Others joined the *Mujahideen* and left their land to women and to the older generation. A drop in the demand for decorative plants obliged flower producers to reduce their production and to diversify. Farmers in the secure areas did not introduce any major changes to their production systems. Horticultural farmers continued their activities without expanding their production.

Kabul is relatively safe and rural communities flowed into the capital settling in towards squats and illegal constructions (Levron, 2006) and towards refugee camps at the Pakistani

[30] Kuchi nomads are an ethnic group (Pashtu language), who traditionally move with their herds in Afghanistan, Pakistan and Iran.
[31] Union of Socialist Soviet Republics
[32] Founder the Khalq party with Taraki
[33] God combatant
[34] Word defining religious war in the Koran

border. In the countryside, farmers were scared of the bombs and no longer went to work in the fields; infrastructure (in particular of irrigation) was destroyed by the bombardments and the production dropped considerably.

Agriculture adopted a prudent strategy

The population who arrived in Kabul was rural and highly varied. The city increased in size gradually and arable land was reduced (cf. Annexe 8).

In spite of the population increase, the reduction in farming land and the borders closing, agriculture continued without drastically modifying its farming systems. Urban demand was especially based on wheat, given that rural communities were used to basing their meals on bread. In addition, the country was at war and farmers were thus able to ensure their own food security rather than producing for the small urban demand for vegetables. Moreover, employment opportunities were available for the Kabul population; the farmers who were affected by the expanding city chose to reorient their activities partially or entirely towards public office or unqualified employment.

In 1985, Kabul had two million inhabitants (Magnaldi, 2004), which represents an increase of more than 100% in less than ten years. The city was not damaged by the war but underwent dramatic reorganisation due to the massive arrivals (Levron, 2006).

4.1.1 Doctor Najibullah: a step towards the intensification of farming systems (1986-1992)

In 1986, Gorbachev decided to withdraw his army, the Soviets prepared for their departure and were less offensive. Najibullah was nominated to replace Karmal within the framework of the national reconciliation policy, who gave up on the military solution and tried to integrate *Mujahideen* in negotiations (Dorronsoro, 2000).

After ten years of conflict, Afghanistan passed from a situation of quasi self-sufficiency before the war to massive imports following the fall in national agricultural production. Najibullah then undertook to increase agricultural production. His policy consisted in modernising and expanding the agriculture sector, supported by a welfare state which oversaw this reorganisation process.

- *Agricultural intensification*

Throughout the country, cooperatives were set up to ensure inputs distribution (mainly urea and improved seeds) and the collective use of motorised machinery (tractors and threshing-machines). Individual guidance was provided by agricultural advisers. Agronomic research centres worked on seed improvement. An agricultural bank facilitated access to credit for farmers. All of these innovations were organised according to a communist logic of planning and pooling the means of production.

This first intensification phase was mainly achieved by capital investment, which resulted in an improvement in yields, particularly wheat. Manual labour is progressively replaced by machinery thanks to capital investment, and labour productivity increases as a result[35]. Modernisation of the agriculture sector is accompanied by the development of the food industry (factory producing urea in Mazâr-e-Sharif, the construction of silos, modern bakeries (National Atlas, 1984)).

In Kabul, horticulture is encouraged in response to an increase in local market demand, when access to the city was limited due to fighting. Fruit trees were planted (or replanted) and vegetable seeds distributed. Consequently, some of the Kabuli farmers started up market gardening and arboriculture or increased their farming land. Indeed, the improvement in yields allowed farmers to harvest the same amount of wheat on a smaller plot and grow

[35] Labour productivity is defined by the harvested production/working time invested.

other crops on the remaining area (having satisfied demand for wheat). These "new" crops are all the more attractive since they sell for high prices: the demand was high and the offer low. Increasing land pressure due to urban expansion also encouraged farmers to grow crops which provided a stronger added value for the same surface area.

- *Access to market gardening, however limited*

Not all farmers can convert to market gardening as this activity needs a decent amount of water (e.g. short but frequent turns in the water rota) over a long time, as well as enough labour as these crops require more care. Only landowners with a sufficient budget (to cover the family needs while waiting for fruit trees to give a return on investment) and access to water, can branch out into arboriculture. Some Kabuli farmers do not have the technical know-how to practise the horticulture.

For some landowners, agricultural activities no longer have a real comparative advantage. Production conditions are poor, the available land surface too small for sustainable farming activities or farmers have opportunities to do other types of work. This category of farmers benefits from the demand for housing and sells their land and looks for other types of work.

- *Consequences of population growth on agriculture*

Wells are dug to provide for domestic water requirements. They have to be dug very deep because of the fall in the level of ground water, drain wells and some *karez.* Farmers who generate an income thanks to market gardening, in a climate of relative stability, dig wells which enable them to irrigate their crops more regularly. Loans made available to farmers make it possible for them to buy water pumps.

The shift from food crops to commercial crops has resulted in an increase in farm rents as landowners also want to take advantage of the benefits of this new type of production. Farm rents also increase with the construction of a well on the land.

The introduction of tractors and threshing-machines encourages farmers to sell their oxen. This process of mechanisation and the income generated thanks to commercial crops tend to have a negative impact on the mutual help system which existed: farmers were accustomed to lending their animals or helping other farmers harvest their crops. The use of external labour is increasing.

In response to the growth in population, Najibullah has engaged in building infrastructure and residences, which encroach both on fields and government land, which was formerly used for pasture. This limits the possibilities for grazing animals or producing fodder crops, which in turn induces farmers to decrease the size of their herds.

Listening to farmers who are nostalgic for the period when inputs were distributed liberally, Najibullah's policy seems to have durably marked their spirits.

Najibullah's agricultural policy in a closed city with a "guaranteed" market thanks to local demand coupled with the increasing land pressure thus encourages farmers to modernise (mechanisation, building wells) and to innovate (market gardening and arboriculture).

4.1.2 Kabul, a city in ruins (1989-1996)

When Soviet army left the country in 1989, finally overwhelmed by the *Jihad*, more than half million houses were in ruins and less than half of the national arable land was being used for farming (most of the irrigation infrastructure was completely or partially destroyed) and 70% of the asphalted roads were destroyed. Estimates indicate that a third of the total population, nearly 5.5 million of Afghans, had taken refuge abroad (in Pakistan and in Iran).

The calm before the storm (1989-1992)

The communist government and the *Mujadideen* met head to head. People flooded into the areas of Kabul that had been relatively saved. Refugees moved to the capital in search of employment or humanitarian aid. According to the intensity of conflicts, the capital sometimes attracted people in search of safety and at other times people fled.

In 1992, the fall of Najibullah announced the end of the communist regime and the *Mujahideen* entered the capital. Kabul fell into the hands of the victorious warlords. The various factions confronted one another and Kabul found itself at the heart of a civil war: whoever held Kabul, held Afghanistan. The city was divided into multiple battle fields.

Kabul with fire and blood after the collapse of the state

Once the country had lost its government, it plunged into chaos. From 1992 to 1996, as a result of the confrontations between Massoud and Dostom[36], Kabul was the scene of fire and bloodshed. People fled from one part of the city to another, according to where the frontline was currently situated or fled the city. After four years of war, Kabul was in ruins, emptied of its population, when previously fourteen years of communist regime had drawn the rural population there. The city was cut off from the world. It underwent significant changes, whole districts were raised to the ground. Trees were cut down in order to locate the enemy more easily. The need for firewood also contributed to the reduction of wooded areas.

- *The population fled; farmers turned to growing food*

Intra urbi flows were also valid for farmers who were looking for land where there were fewer risks. When farmers land was situated on the frontline, they send their families abroad, leaving the oldest and the youngest behind. Pakistan and Jalalabad were the most popular destinations. Fighting was often extremely violent and Kabul farmers suffered many losses. Most of the livestock was killed (animals were taken by the soldiers, killed by bombs or sold). The end of the Najibullah government also meant the end of his agricultural policy and the promotion of intensification. Farmers no longer received any support.

Farmers hence adopted survival strategies, reducing the number of times they visited their fields and choosing crops that require little work, such as cereals (cf. Annexe 8). In many cases, some of the family labour force took refuge elsewhere or was killed. The production systems are more extensive and are intended for home consumption. The destruction of the irrigation networks and the presence of mines in the canals complicate the irrigation process. Farmers are increasingly inclined to give up crops that require a lot of water or leave part of the land to fallow, not having sufficient water to irrigate all of them correctly. The *Karez* disappear either because they are blocked by the war or because of lack of maintenance. The orchards suffer at the same time from the bombardments, the destruction of their watering system and because they are no longer looked after properly due to the reduction in the family labour.

Other farmers, in areas that were less affected by the war did not alter the type of crops but reduced their production.

When the Taliban seized the country, the economy was at its lowest; much of the population had evacuated the country, agriculture had sharply decline and industries had been dismantled. Kabul had only 1.5 million inhabitants (Levron, 2006). It was a devastated city, many of the houses had been demolished and it resembled a vast battlefield.

[36] Afghan war leaders

Kabul, the depraved Babylon to purify[37] (1996-2001)

In Arabic, the "taleb" are koranic seminarists or theology students, the majority of whom had been trained in Pakistani refugee camps. Taliban are armed groups who fought, like the other factions, in order to conquer territory, but promised the return of rigour, high morals and a state of calm. Thus, tired by these destructive battles, people accommodated the Taliban in the hope of better times.

Figure 4: Kabul during the Taliban regime

Source: 1996© Didier Lefèvre

- *Taliban austerity*

Taliban began to seize power in the country since 1994 and took Kabul in 1996. They applied a rigorous and radical policy throughout the whole country. Great population movements took place: *"displacement becomes the principal survival strategy of the populations as well as a strategy of war operated by Taliban"* (Magnaldi, 2004). The population is forced to migrate *"200,000 people were moved from Shamali plain towards Kabul, [it appeared] that this forced displacement was an act of war"* (Mardsen [2006]). The last symbols of modernity in the capital disappeared from the landscape. The urban inhabitants were forced to return to a traditional way of life, letting their beards grow, wearing a turban and the Afghan traditional dress. Women were not allowed to leave the home without a man and were obliged to wear the *burka*[38]*.* A religious police force took care that everyone abided by the Islamic law.

Some refugees returned to Afghanistan because of improvements in security and the pressure exerted by Iran. They settled in Kabul, whereas some urban inhabitants choose to flee the city.

- *Renewed interest in farming*

The presence of the Taliban caused great changes in people's lifestyle but the city became safer and farmers were affected to a lesser extent. Hence farmers choose to stay in the city. The two main problems resulting from the presence of the Taliban was the drop in the number of consumers and the increase in farm rents.

Vegetables prices, and the cost of living in general, increased. Some market-gardeners speculated on these prices during the Taliban regime. The city borders were controlled and the country was under embargo (Dombrowsky, 2005). However, farmers often reduced their vegetable production because of the lower number of consumers in Kabul or because of transport difficulties. They stopped employing women for the agricultural work as this was no longer accepted.

[37] According to Taliban, quoted by Magnaldi, 2004

[38] The *burka* is a long dress which covers the body from the top of the head to the feet, with only a wire net opening at the level of eyes and nose.

Some ministries (such as the Ministry for Women's Affairs) and schools were closed down and many civil servants were made redundant as they were replaced by members of the Taliban networks. Among those who remained in Kabul, some temporarily started farming instead. The demand for arable land and farm rents increased following this renewed interest in agriculture.

In spite of this, farmers did not modify their production systems, given the instability of the situation.

The Taliban did not have the means to rebuild the country, there was not real economic policy and the country stagnated without really sinking back into war. The Afghan people had no real hope for the future and hence there was no visible impetus for innovation or investment in land or construction.

- *Drought which is still affecting the country*

Three years after the arrival of the Taliban in Kabul, Afghanistan, which was already affected by lack of water, saw the situation get worse with a drought that lasted from 1999 to 2001.

The few orchards which still remained were then completely desiccated. The lack of fodder and grass in the pastures throughout the country prompted stockbreeders to sell their cattle, and prices consequently fell. In Kabul, like everywhere else, livestock breeding no longer forms part of farmers' production systems, as it no longer adapted to the available resources and drop in profits.

The drought accentuates the recourse to farming strategies that compensate for this lack of water, many of which had already been adopted before. This reaction is not specific to this period. Indeed, in a specific or definitive way, each area, at different times, has had to face with a water deficit.

Thus, the phenomena that are described here are valid each time that the irrigation capacities are affected, with the only difference that the effects of the drought are more severe and widespread throughout the country.

It is possible to distinguish two scenarios: 1) where it is possible to compensate for the lack of water with a new source of irrigation and, 2) where the system needs to be adapted to this low availability of water.

In Kabul, the only possibility for farmers to supply themselves with water[39] is to build a well; which is expensive and is not accessible to everyone. Wells that were already built were dug deeper seeing that the water table dropped of 4.6m during the drought, according to the studies of the Canadian Association for the hydrous resources (Fearon, 2003). Where the water table is less than 25 meters deep and where the subsoil texture makes it possible to dig easily, landowners dig wells. Sometimes the tenant finances the work himself. Generally, the well digging is accompanied by an increased specialisation in farming systems. It is possible to identify two types of specialisation strategies:

- Towards more profitable crops to compensate for the increased rent or to allow the owner to cover his investment. A constant water supply makes it possible for farmers to grow crops that require more water, such as vegetables. The well also means that farmers can draw out the cropping season and increase the number of production cycles.
- Towards crops which need less water, such as cereals (except corn) or vines, because of the high cost of fuel for the pump.

Where digging a well is impossible because of the subsoil quality or because it represents too high an investment, farmers move towards a more extensive crop system or towards a

[39] Considering that any other source (canals, river, *karez)* is collective and are not based on individual decisions. These systems are collective in order to carry out economies of scale.

reduction in crop diversity and retain only the less water demanding and most useful crops for the family. In parallel, the farmer may also choose to take up part-time work or sell their land. If it is not possible to supply the fields with water, landowners who are not farmers themselves then encounter difficulties in finding a tenant or a sharecropper. The yield becomes so weak that, once the rent is paid, the remaining production is too slight to satisfy the family's needs. Some owners return to their land as no-one is interested in farming it; in this case, they adopt a simple food and extensive production system.

The former tenant then looks for other land in Kabul or in more distant places (which is more difficult) or looks for daily employment.

Rather than a more extensive system in the river irrigated plots, some prefer to concentrate the quantity of available water on some of the land, thus reducing the amount of land that is cultivated. In fact often the worst plots are abandoned although they may also be left to fallow on a two-yearly rotation. The rest of the land is preserved with the hope that more rain will come in future years. The choice to reduce the amount of land cultivated rather than changing the type of crops allows the farmer to continue growing commercial crops and thus still generate a monetary income.

All the examples where farmers chose to reduce land productivity or even to not cultivate it at all are located in the outskirts of Kabul; areas that are close to the town centre are cultivated or sold but are never left to fallow.

The international community is still present in Afghanistan. Some NGOs have established contracts with Kabuli farmers: improved wheat seeds are distributed and, in exchange, farmers must sell their harvest to the NGO who then uses this cereal for food distribution. Some collective farming wells were dug but humanitarian aid did not really have a significant impact on agriculture in Kabul.

After the terrorist attacks in the United States, the Bush government and the "international coalition" decided to engage in the war against terrorism and, in particular, in Afghanistan where they suspect Al Qaida troops, who claimed responsibility for this attack, were hiding. An American-led military campaign attacked Taliban bases and provided support to the opposition movement. November 2001 marks the end of the Taliban regime (Dombrowsky, 2005).

"Troops of the Alliance of North enter in a Kabul deserted by Taliban. It is a capital exhausted by nine years of conflict and of massive destruction which arises at them." (Magnaldi, 2004)

4.1.3 After 2001, rebuilding and competition between urban development and maintenance of agriculture

Afghanistan is a destroyed country; there is no government in place. The Bonn Agreement (December 2001) nominate Hamid Karzai as head of the intermediate authority. The international community, the UN[40], the army and NGOs, are involved in the rebuilding of the country. The embargoes are raised and the economy is jump started. Foreign military forces ensure security within the country.
In 2004, the first free elections were organised in October. Mr Karzai was elected President of the Islamic Republic of Afghanistan.

A high demand for land

With this return to a state of calm, there was important movement of population towards the city (cf. Annexe 8). Host countries encouraged refugees to return to their country. Many refugees do not return to their area of origin but prefer instead to settle in urban centres, as they had become accustomed to living in this type of environment during their exile (Mariani,

[40] United Nations Organisation

2006). Kabul also attracted Internally Displaced Persons (IDPs), those who had fled their area of origin in the hope of finding work and housing. The severity of the drought which affected the whole country was still prompted rural communities to move to the capital. Thus more than 600,000 people arrived in 2001 in Kabul. At this point, nearly 20% of the Afghan population was then living in an urban environment (Magnaldi, 2004).

Housing became problematic with squats, illegal constructions, the desperate search for land suitable for building or rented accommodation becoming the everyday life of the Kabuli. Conflicts over land ownership occurred in the town centre (Mariani, 2005). In the outskirts of Kabul, the demand for building land was high but there do not appear to have been any problems related to theft of land.

The demand for land was very high and thus prices also rose (from EUR6-20/m²; EUR80-170,000/ha). The value of land underwent an exponential increase, even more severe than the increase that had occurred during preceding migratory movements. Whereas during the Jihad, mainly rural communities flooded into Kabul, now some of the incoming population included those with a more significant purchasing power, stemming from savings made abroad or the poppy trade[41]. Huge "Pakistani style" houses that began to crop up everywhere in the Kabul landscape attest all too well to this new purchasing power. The majority of newcomers are unable to afford this type of house which contributes to the increase in land prices.

The strong land pressure coupled with the explosion of land prices lead to a risk of production system saturation. Several scenarios can then be identified in Kabul.

Much of the demand for building land focuses on agricultural land. Thus, many non-farmer landowners sell their lands, given that the land often fetches a much higher prices that level of income that can be made from renting out this land. Moreover, in order to remain agricultural, these fields often require the construction of a well which implies investment. These owners tend to keep their land only if they can demand a high rent (which implies fields with sufficient water supply). Farmers who do not have enough land or who can generate more income by selling their land rather than farming it or who intend to seek employment and/or invest in a new business generated by the urban expansion decide to sell their land. The drought also prompted farmers who were unable to find a solution to the water shortage (e.g. wells) to sell their land. This configuration is Malthusian: the farmer ceases his farming activities. Unlike landowners in rural areas, in this situation, the sale of urban land generates profit which can be invested in another activity. The tenant might find another job in the city.

Other owners or tenants keep their land or sell only a part of it in order to satisfy their money needs while preserving enough land to be able to continue their farming activities. If they are in a food system, they continue to produce enough for their family's needs. If they are partly in a commercial system, either they continue as before or they intensify their system. These farming landowners are not as severely affected by the land pressure as tenants[42].

The tenants on the other hand adapt to the land pressure, thanks to a strategy of intensification and specialization as Boserup's thesis postulates. Proximity to the market and the lack of alternatives for other employment, even downtown, means that all the available irrigated land is cultivated in an increasingly intensive way. In Kabul, this intensification is carried out at the same time as a capital investment (with an increased use of inputs and the construction of well) and especially by extra labour investment. The extra work entails a greater use of the family labour, but also recourse to external labour.

[41] Poppy sap is used to make opium. This crop has considerably developed over the last years, generating significant profits for poppy farmers and those involved in the processing chain.

[42] Land pressure affects farm rent but, as their is no land tax, it does not increase the expenses for farming landowners.

This labour intensification is only possible because the population density is sufficiently high to provide the necessary labour force. It is also necessary to grow crops which generate enough profit to offset this intensification. Indeed, to intensify the wheat crop by providing more work on the plots does not lead to a great increase in yield, nor to a rise in value of the work invested. As well as increasing pressure on the available land, the growth of the urban population also makes it possible for farmers to specialise by satisfying the demand for fresh products.

As Boserup shows, as a system undergoes intensification, livestock breeding activities have a tendency to disappear. Livestock breeding takes up too much space and producing enough fodder requires a large surface area which could be use more profitably for growing crops. In this system, the complementarity between agriculture and breeding in terms of fertilisation has lost its relevance. In Kabul, the selling-off of cattle had already began due to the difficulties in finding enough fodder for the animals. Thus crop rotations with leguminous fodder plants disappeared for the main part and beans are the only crop that provides this function in the remaining food-producing systems.

Contrary to the Boserup model which forecasts the use of artificial fertilisers, urban agriculture is able to use urban waste for fertilisation purposes. Downtown, the increase in population density implies an increase in the availability of human fertilisers. These natural and free manures are used by the horticulturists.

This specialisation towards horticulture is not instantaneous. Being aware of the existence of a market is not enough to start up new crops, indeed farmers need to develop a certain know-how. The drastic increase in rent in some areas encouraged farmers to leave and settle on the outskirts of the city in order to engage in market gardening. The diffusion of truck farming is achieved when a farmer, who is experienced in growing vegetables, leaves the city centre and shares his knowledge with other farmers.

The change in production systems increases the tendency for farmers to pay rent in cash rather than in kind (wheat) and the transition from share-cropping to renting. The rise in land pressure has caused an increase in the cost of rent.

Still now, after five years, land prices remain high and continue to increase. The demand continues to rise because the city continues to grow and the population, thanks to certain stability, continues to build houses but also because the agricultural demand remains strong. In the same way, farming rents, in the most coveted areas (near to the city or along the main access routes), have continued to increase each year for the past five years.

High demand for vegetables and flowers

Some of the returnee population has a relatively significant purchasing power and was accustomed to eating vegetables. Contrary to the movement of rural communities into Kabul, the returnee population consisted primarily of an urban population with a different lifestyle. Thus, a fall in the farming population combined with an increase in the urban population, sometimes with a higher purchasing power and different food practices, has strongly contributed to an increase in the demand for vegetables and flowers. Wholesalers, who had not experienced any dramatic changes in the market since Najibullah, have witnessed an important rise in demand since the return of peace. The volume of the market has grown 300%, passing from 300 to 11,000 shops on the market. This demand has thus allowed Kabul agriculture to intensify.

After almost half century of austerity, flowers, the symbols of life and parties, are important for the Afghan people. In the living memory of all florists, the demand has never been so high. Even households with modest incomes buy flowers. The plastic flower market has also developed, but the fresh flower market, particularly rose trees and geraniums are also successful.

Flower producers saw a boom in their trade: they increased their volumes and generally diversified the cultivated species and varieties. Some "non agricultural" people with large gardens also started out in this production, thanks to their experience of gardening at home or for other people when in exile working in greenhouses in Pakistan. Some of these new producers are pensioners for whom this activity represents a complementary income. For others, it is a full-time activity and they invest in a greenhouse. If they have a large enough budget, they sell their flowers in small stores.

The demand for fruit also exists, although Kabul agriculture does not seem to be overly interested in it. Indeed, the perennial crops mean that farmers have to wait a few years before trees will bear fruit and only farmers with a decent budget can afford this investment. They often prefer truck farming which is profitable more quickly thanks to a short production cycle. Moreover, some areas fall within the urban expansion plan and farmers were advised not to set up orchards on land that may be built on soon. Even former orchards now contain annual crops. Only a few orchards in the West of Kabul, where there is less water available, have been replanted with more productive new varieties.

Water, a highly coveted resource

With the arrival of new inhabitants, the city's water requirements increased. New wells have been dug and the ground water level continues to drop. Informal settlements have caused irrigation canals to get blocked up. Moreover, the emergence of a new Kabuli market has prompted producers in the outskirts of the city to specialise in market gardening. Consequently, water requirements are higher in these areas. Thus, farmers in the Logar plain, upstream of the river use more water, causing a reduction in the river water flow[43] when it arrives in Kabul. Water availability for agriculture is also reduced. Water shortages coupled with the reduction in river water flow, due to the drought and global warming[44], have given rise to conflict over water distribution between users within the same perimeter or between upstream and downstream users. At present, some farmers refuse to clean the canals, feeling that they are prejudiced. In the same way, the few *karez* that still exist in Kabul are not being maintained, the quantity of water does not justify effort required to clean them.

The strategies adopted by farmers in response to the drought during the Taliban regime are cropping up again but in a new context: in a city undergoing full expansion.

In the market-gardening areas, where the water table is very deep, some people continue to invest in drilling machinery and then sell some of their water to their neighbours; a water market is developing.

The most common strategy is to abandon farming activities. Land is sold where the demand for building exists and if there is no demand, fields will be abandoned. In the areas furthest away from the city, far removed from the main access roads and r villages, the land market is almost non-existent. There is little interest in building on these areas because they are too isolated and too dry. The purchase and selling of land is done exclusively on land intended for non agricultural use. Arable land is pushed back increasingly towards the outskirts.

In spite of a strong land pressure, uncultivated lands are appearing in the Kabuli landscape. Difficulties encountered in selling land in certain areas, the introduction of fallow land and the conservation of waste land in the hope of cultivating it again one day (increased rainfall) or the hope to sell it later explains why there is so much land that is seemingly abandoned in Kabul. We observe great disparities in the demand for land within Kabul. Areas that are at a distance from communications networks are not highly sought after for building, except for

[43] cf discussion with Mr Khulmy, person in charge of the hydrology department in the Ministry for Water and Energy

[44] Mr Khulmy has data showing that the water flow in rivers has dropped in this area of the world.

large property developers who will invest in hectares of land, building their own infrastructure. Thus where the land is situated determines how the land is used.

Reconstruction

Since 2002, the rebuilding of Afghanistan relies on the NDF[45], based on three pillars including physical rebuilding and natural resources management. Agriculture is one of the foundations of this pillar and in particular the rebuilding of the horticultural chain, which was formerly so prestigious in Afghanistan. The FAO[46] collaborates in the restructuring of the Ministry of Agriculture, which worked out a plan for a new agricultural policy. Agricultural research, which was neglected for many years, has been reinitiated. Government farms work primarily on wheat and potato seed improvement. New and more productive varieties of trees are developed. Truck farming on the other hand has not been studied in detail[47].

The country's infrastructure is slowly being rebuilt, transport routes are being repaired and the country is being reorganised. A large market was built in 2002 in Kabul to centralise the trade of fruit and vegetables.

The Master Plan, which was drawn up in 2005 by the Ministry of Agriculture, aims for growth of 6% per year in the agricultural sector[48]. In order to achieve this, it focuses on the rebuilding and the development of the horticultural sector. This sector has received financial support of USD70 million from the World Bank and the European Community.

The end of the war has also meant that exchange with other countries and the rehabilitation of the transport network is now possible. This also implies that agricultural production from elsewhere can enter Kabul and bring the end to a protected market. Kabul agriculture has now entered into competition with other provinces and other countries, particularly Pakistan.

Over the years, Kabul farmers saw their production means decreasing. At the same time, a huge market is available to them for flowers, fruit and vegetables and thus the possibility of increasing land profitability. This new market makes it possible to compensate for land shortages and the rise in farm rents. Most of the arable land, which easy to irrigate or otherwise, is gradually being absorbed into the city, despite the possibility of intensification and specialisation. Land that is situated close to built-up areas and roads is likely to be swallowed up first. The number of farmers falls. This reduction is at the same time the cause and the consequence of the reduction in Kabul agricultural land. Indeed, some farmers give up farming for other types of work, whereas other farmers had to look for another job because of the lack of land available for farming activities.

Amongst the refugees arriving in Kabul, even if they originated from rural communities it is unlikely that they will take up farming activities. In general, we can consider that these migrants fall into two categories. The first category is made up of those who have the means of taking up an activity, such as craft, trade or other professions (doctors, professors, employees). These people are not interested in investing in agriculture (Levron, 2006), except for growing flowers, which is a more lucrative sector and requires only a little amount of land.

The other category are unable to outbid the experienced Kabuli farmers who put in offers for farm rentals, nor do they have the necessary social network to gain access to land. Their only alternative is share-cropping, often under adverse conditions for the sharecropper. Few refugees went into agriculture in Kabul, the majority choosing instead to look for daily employment, particularly in the construction industry. Thus agriculture remains in the hands of the oldest Kabuli families.

[45] National Reconstruction Framework
[46] Food and Agriculture Organisation, depending in the UN
[47] Discussion with Eng Najibullah, from the agronomic research of Darulaman
[48] Master plan 2005

4.2 The current situation of urban family farms

In this part, we are interested only in UA, which is primarily family based. As we saw previously, these families for the majority have been based in Kabul for generations, and are mainly from the Tajik and Pashtu ethnic groups. However, some Hazaras who settled in since King Amânullah reign are farmers. Ethnic origins are not a source of difference between farmers. Farmers live in traditional houses, generally in the older parts of the city and close to their land. However, farmers whose land lies in the heart of the city do not live near their fields.

4.3 Production factors

Labour force

The work is mainly manual; this agriculture has not undergone widespread mechanisation, due to the small size of the plots and difficult access.

- *The family*

The labour force is mainly provided by the family. In Kabul, agriculture is a man's business and women rarely take part in the farming work. On the other hand, young girls help their father to sow, weed and harvest, just like their brothers. The absence of women's participation in farming activities can be explained by cultural and religious reasons, and by the fact that they are very busy at home. In the same way, women do not tend to be involved in flower production in the greenhouses. On the other hand, they look after the animals.

Farming activities can involve just one member of the family or several members. The father generally stops working between the age of 55 and 65 years. He then leaves the decision making to his sons.
The number of family workers varies in function of:

- Age and sex of the family members (the crops chosen are more or less work intensive according to how much labour is available);
- Crops requirements;
- External work opportunities: possibility of paying for external labour (e.g. children who help in the fields rather than attending school if the family is unable to afford daily labour).

Farmers seldom have other jobs, especially if their production is destined for commercial purposes.

The number of farmers varies from one farm to another, whatever the size of the farm. When the farm is small, there tends to be a greater concentration of labour force, in very specialised horticultural exploitations.

- *Mutual help*

Mutual help is very rare in UA: people are no longer accustomed to collective work since farming systems have become more specialised and with the increase of external labour. Occasionally farmers may organise themselves to rent a vehicle for transporting their produce but, in general, farmers work alone. They organise themselves as a group only for the distribution of water.

- *External labour*

Permanent agricultural employees are rather rare in Kabul. However, some large farms (4ha) may employ a few permanent workers.

On the other hand, it is very common to employ daily workers during the peak periods of work. This labour is recruited in the neighbourhood districts or in the "bazaar" where the unemployed people come to seek work.

The male workers are chosen for soil preparation or for the harvest, whereas women (usually widows) are selected for weeding. Men and women are paid the same wages, which varies from under EUR3 to more than EUR4 for one day's work, depending on the type of work and whether the workers are fed or not.

- *Other types of labour force*

Many farms have an ass or a horse to transport human waste to the farm and to transport the produce to the market. Oxen, asses or horses are used for working the land. Pack animals are often the only remaining animals to be found on farms.

Ploughing and harrowing can be carried out with a rented tractor if the plot of land is accessible for these machines. For threshing, animals have been replaced by machinery which is often rented out by rich farmers. Mechanisation remains rather weak, particularly in horticulture.

Land

The territory is divided up according to the limits of the old villages which have now been swallowed up by the city. In general, a farmer retains the same quantity of land all his life but it is still likely to be reduced following a sale or because it is impossible to farm certain parts of it.

There is no communal farming land in Kabul. Each plot has a single owner and a title deed. Farmers have access to land either directly (i.e. the farmer is the landowner) or indirectly (by renting or share-cropping). The plots are very often grouped together as the land often belongs to the same owner and acquisitions are rare.

All the horticultural fields are irrigated and equipped with a well, as regular watering is an essential determining factor for this type of production.

- *Land tenure*

Direct access:
The Kabuli farmers who are landowners have inherited their land from their father, according to the principles guiding land division which are explained in section 2.2. Farmers are seldom able to buy land themselves. Thirty years ago, land was less expensive but the standard of living was lower and based primarily on food agriculture, which did not allow farmers to buy land.

Land may be divided before the death of the father to be farmed individually by each son or as a joint effort by all the siblings.

The fact that the land is divided up for each generation explains the small size of the farms (0.1ha/UHL[49]) and why farmers are obliged to rent more land. This division land into smaller units also explains why certain owners are obliged to sell their lands, when the plot becomes so small that it is no longer economically viable to farm it.

Indirect access
In UA, most farmers access land by means of renting or share-cropping, although there is stiff competition, except from land that is not irrigated. Farmers who rent or share-crop their land have very few possibilities to modify the terms of trade, which are in general unfavourable to the farmer. If the farmers protest, the landowner can easily replace them with another farmer, even where the prices are exorbitant.

Land access is possible thanks to the social network, the farmer's reputation and his capacity to outbid the rent. Contracts from 1 to 7 years are agreed between the tenant and the landowner. Non-farming landowners are often from families who have been non-farming

[49] UHL= unity of human labour; = 1 for a man and ½ for a child.

landowners for many generations. They live abroad or practise liberal professions. Some are government employees.

- *Share-cropping*

Share-cropping is still present in Kabul but is not the most common type of access to land. It previously took the form of a land tenure allowing the landowner to feed his family and his animals. Now, the majority of landowners no longer have the same needs or do not live near their lands and so prefer to be paid in cash.

Share-cropping is particularly common for arboriculture and vineyards. The harvest is divided in half if the sharecropper provides inputs and work, and if the landowner provides inputs, he receives 2/3 and the sharecropper 1/3. The sharecropper must often adhere to the landowner's farming plan. The few migrants who are farmers tend to be sharecroppers. Share-cropping has the benefit that the risks are shared, in particular in a country affected by drought such as Afghanistan and allows the share-cropper not to get into debt with the landowner. There is a tendency for share-cropping to be replaced by renting.

- *Tenant farmers*

Several forms of tenancy exist in Kabul: either the rent can be paid in kind (wheat) or in cash. The rent partly depends on water accessibility, from 1t 400 of wheat/ha for land with water supply and the furthest away from the city to 2t 450 of wheat/ha (= EUR350/ha). Otherwise, renting is paid in cash, from EUR500/ha to EUR2,300/ha (i.e. 14t of wheat/ha), where river water is accessible for the main part of the year and where the ground water is not very deep (as a comparison, the rent is equivalent to a quarter of the selling price).

Some farmers who pay rent in wheat prefer to produce only vegetables and then buy wheat with the profits rather than cultivating wheat, which is much less profitable.

Because of the high demand for land, landowners are in a powerful position and can set high rents.

Sharecroppers or tenants are sometimes forced to leave the land which they have been farming because it has been handed over to other farmers (e.g. following a bid), or sold for building or because there is no more water. Consequently, land tends to change hands regularly at the level of tenants and sharecroppers, especially in areas close to the town centre. It is possible however that if a tenant succeeds in farming a large surface area by working well, he may then receive the trust of the landowner who may grant him his land.

- *Selling off of land*

The selling off of arable land for agricultural ends does not appear to have taken place for many years. Land may be handed over or rented but it is not sold due to its high value and the difficult in paying off the investment by farming activities. The price of land has doubled in ten years: one hectare is worth EUR50,000 to 300,000 according to its position in relation to the town centre or the main roads.

Landowners are extremely tempted by these prices. The selling off of land is a phenomenon that develops as prices rise. Selling part of their land allows the landowner to satisfy his money requirements. However, this further reduces the amount of land to be handed down to the following generation and places further pressure on land availability.

Non-farming landowners readily sell their lands without necessarily drawing up a lease. At best a compensatory sum may be paid to them, which highlights the prevailing land insecurity.

Material security is related to land tenure; it is threatened by the expansion of the city, by the expropriation of land by the government and by the uncertainty over long-term water availability.

Water

Given that rainfall is insufficient, irrigation helps farmers to extend the farming season and the diversity of crops grown. UA is irrigated from the river and water from wells. As we saw in section 2.2, the distribution of water through canals is organised and the quantity allocated varies according to the river and the season.

Water obtained from drilling poses a number of problems: it is too cold when the crops are water, it may have a high salt content and contains less sediment than the river water. Moreover, there is an implementation cost involved (purchase, maintenance of the motor-driven pump and fuel).

Irrigation by gravity has a low capital cost and uses little energy (if a water pump is not used) but requires a great deal of work. It is appropriate for clay soil. The efficiency of the water ranges from 50 to 70% (CIRAD, 2002), which is relatively poor.

A well is expensive to use but presents a certain security and guarantee of being able to irrigate (if it is rather deep), as well as freedom and flexibility in timing. Watering by river water is inexpensive (maintenance cost of the canals) but the user is dependent on the climate and on the users upstream; moreover, he has no choice in terms of timing and this is determined by the water rota. Nevertheless, farmers appear to find the river water option more advantageous as it is free and heated by the sun, which is preferable to the cold water coming from the underground.

Some farmers take advantage of the canal irrigation system but also build a well as a complement and as something to fall back on in the event of insufficient water.

Capital investment

The main investment for urban agriculture is labour as it does not require a significant amount of capital. Animal traction is increasingly being replaced by motorised vehicles.

Most farmers do not have bank accounts, even the wealthier farmers. They keep their money as cash, and savings are invested in animals or in another field for farmers. However, the majority of the farmers in Kabul are not able to save.

Whilst bridging the gap between harvests, the majority of farmers run into debt in winter and in early spring in order to buy inputs and food. It is not possible to defer the purchase or hire of means of production (cf. Annexe 9) and farmers must be able to buy them as and when they need them. Daily labour needs to be paid immediately in cash and farmers are therefore obliged to have the necessary sum available before the harvest.

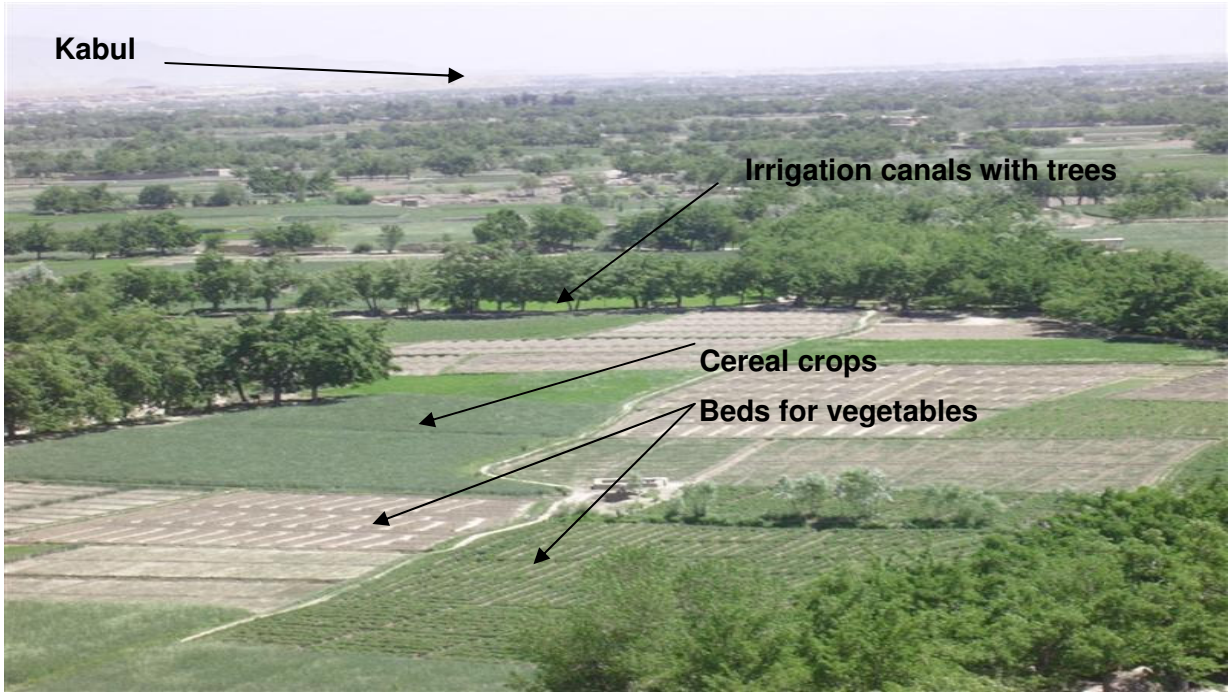
Given that farmers need to have a readily available supply of cash, if the farmer has not been able to save money from the previous harvest, he can borrow money. As credit via a bank is not an option, they thus turn to the informal network. For small sums, loans can be taken out from close family. It is also possible to have credit at the inputs suppliers. This credit can either be paid off in money or in kind: fuel, seeds, urea or wheat. Sometimes, for example during the drought, farmers were unable to pay rent to the landowners and are now repaying this sum in wheat for the next few years. Farmers tend not to pay any interest in this case, in accordance with the Koran. Usually, the type of loan lasts less than one year and is paid at the harvest. On the other hand, for larger sums (cf. Annexe 9), farmers take credit out with wealthier acquaintances, to whom they will refund the sum borrowed in money and the interest in wheat.

Farmers do not tend to encounter any difficulties in finding a creditor as the money is easily available downtown. Farmers can also sell animals and land, or withdraw their children from school so that they can replace the daily workers. They can also manufacture bricks on their fields and sell them.

4.3.1 Production systems

Crop system

Figure 5: South of Kabul, food and vegetable crops



Source: C. Laillet, April 2006

Kabul agriculture suffers from the poor quality of inputs bought on the market. This is partly due to the obsolete import control system. The urea is weak in concentration, the seeds do not always correspond to the indicated species or variety and a large proportion fail to germinate. Sometimes pesticides and veterinary products are not longer active. Imports would benefit from stricter controls.

Fertilization is mainly achieved with urea and human waste which is dried over a twelve-month period and mixed with ash. Once dehydrated, it is then reintegrated into the soil. The fertility transfer takes place from the city to the fields.

Several types of production are possible thanks to fertilisation and can be grown to a greater or lesser extent, depending on the degree of specialisation.

- *Home consumption*

Crops such as wheat, potatoes, onions and beans are grown for consumption by the family over the whole year. This includes crops that are destined for animal fodder, primarily barley, corn, clover and alfalfa. The production of leguminous plants is tending to decrease with the reduction in livestock breeding, despite their considerable advantages in the crop rotation (fixing of atmospheric nitrogen). Clover and alfalfa, with their deep roots, split up the heavy soils and produce more organic matter.

- *Market gardening*

Although a small proportion of these crops may be consumed in the home, they are mainly intended for the market. Thanks to their short growing cycles, it is possible to grow several

crops of vegetables per year. Moreover, these short cycles also enable farmers to generate money quickly and thus relieves some of the pressure on the family budget. This type of production does however require investment in labour, seeds, urea and pesticides.

- *Perennial crops (trees and vineyards)*

These crops are not overly common in UA because they are highly demanding in terms of land security, protecting crops by building walls, the amount of time required for the plants to reach maturity before they start producing and the risk of frost. The main crops are apple, peach, apricot and vines.

Figure 6: Flower greenhouse in Kabul

Source: C. Laillet, July 2006

- *Decorative crops*

There is a wide range of flowers grown in Kabul but the most popular species remain rose trees and geraniums. These crops are generally grown in greenhouses, or in the case of rose trees, planted in open fields.

It is common to find crops associations planted on the same bed, as the culture cycles overlap. Crops rotations are generally practised by alternating cereal crops, leguminous plants and vegetables. However, in highly specialised farms, crop rotations are not always possible or even required, as farmers tend to prioritise the most profitable plants. The lack of diversity in market gardening also leads to “useless" rotations (e.g. tomato/potato/aubergine, which are all three Solanaceous, and thus the effect of rotation is null).

Livestock breeding

There are very few poultry farms (almost all of them were closed down) due to preventive measures that were taken against the threat of an influenza epidemic but they are gradually beginning to return. Some farms have a cow or a goat for milk. One or two sheep will provide meat for special occasions.

Draught animals such as horses, asses or oxen are used for transport and work in the fields. Animals are fed with fodder crops, grass on the edge of the canals and roads/paths and the stubble.

There is no real association between arable farming and livestock breeding: animal manure is not used to fertilise the fields and vegetable waste is not fed to the animals.

Marketing

Agricultural produce is and not processed.

- *Fruit*

Fruit is collected by wholesalers for the Kabul market. Seeing that fruit tends to suffer in transport, it is conditioned into small wood cases. The price is negotiated at the time of purchase with the wholesaler and the cost of pumping water for irrigation will be added onto the price.

- *Vegetables*

The majority of farmers travel to the central market themselves to sell their harvest to the wholesalers. Only a few sell their produce themselves in the main bazaar. Others, who do not have the necessary means of transport (small farms) or the time (big farms) sell to tradesmen who are interested in buying the harvest in advance. They pay then an advance to farmers to ensure that they will reserve them their production. Although the price is not fixed beforehand this advance guarantees the tradesman that the farmer will not negotiate with the competitors and thus will not increase the price.

When they are able to do so, it is in the farmers' interest to sell their production themselves.

Generally, producers do not have a privileged contract or link with a particular wholesaler; they sell to the higher bidder.

Farmers are generally well informed about the market demand and prices. Indeed, when they know that the market is saturated in one product and that as a consequence its price is very low, they will wait before harvesting this same product, given that the cost of labour for the harvest and transport are unlikely to be covered by the sale.

This direct sale limits the losses at the harvest, which takes place in the evening and is transported early in the morning to the market.

- *Flowers*

Salesmen buy flowers directly at some of the more well-established producers, or alternatively, in some cases, producers have got to know the salesman and go to them directly. The recognized producers do not tend to run out of stock but those who are just starting out do not always find enough outlets for their flowers because the competition with the other provinces and Pakistan is high. The older producers do not have this difficulty because of the quality and diversity of their production.

Usually, the Kabul farmers have an advantage compared with farmers from remote areas as they are able to sell their production directly at the central market, and even if they sell via a wholesaler, the number of intermediaries is limited.

4.3.2 Factors of differentiations of the systems

As we saw in section 3.1 Kabul and urban agriculture zoning and then in section 4, the decision to shift over to commercial crops is strongly influenced by water availability and land pressure, which varies from one area to another.

However, within in area, each farmer does not have exactly the same degree of specialisation. Intrinsic factors influence these choices:

- Type of land tenure: a farming landowner will initially try to cover his family's needs or at least part of his production will be dedicated to subsistence crops, in particular fodder for the animals, whereas the tenant must first refund the rent and is thus more likely to focus on commercial crops, even if the risk is higher.
- The availability of family labour will have an influence on crop proportions: the more labour there is, the more likely farmers are to grow crops that require a lot of work.

- The amount of farmland determines the crop choice. If the farm is small, farmers will focus on flowers[50] and large surface areas will encourage farmers to grow food crops. The size of the farm also has to be compared to the number of people in the family to feed. For a small farm, the farmer may find it advantageous to grow commercial crops, which have a higher added value and will enable him to buy more wheat than he would have harvested if he had sown the same area with wheat. On the other hand, if the farm is big enough to satisfy his own family's food needs and also grow a small commercial surplus, in general, the farmer will not specialise too much and thus limit the risks.
- Technical experience is an important factor in the success of a market gardening enterprise and in getting a good balance between production and market needs. Thus a farmer who controls his production can have a larger proportion of commercial crops as the risk of failure is lower.
- The presence of other sources of income within the family unit. If the alternative income is small, farmers can focus on food crops as opposed to commercial crops. On the contrary, if there is a significant alternative income, some can be reinvested into the agricultural production system, enabling the family to see farming not as a source of food but as another income-generating activity. Thus, the family will invest in farming activities, and production choices become speculative rather than a security net.

It is important to note that this decision to invest in cash crops is facilitated by the existence of outlets but also by the possibility of buying food elsewhere, as it is easily available in the markets, which would undoubtedly not be the case in remote areas.

[50] However, in the case of flower producers, the majority were not previously involved in growing crops for food. They do not tend to come from farming families and chose to grow flowers from the outset.

5 Assessment and prospects for Kabul agriculture

5.1 Assessment

"Where the city extends, is agriculture condemned to disappear to the profit of the cranes and asphalt advance? Are the city and agriculture realities which excluding them mutually, without one enters in the composition of the other? " (Chevrier, 2001)

5.1.1 A strong link to the city which makes urban agriculture fragile

UA is dependent on the city, both upstream and downstream of its production activity: inputs, human waste or urea come from the city and the resulting harvest is then transported to the urban markets. UA is entirely linked to the city and to its inhabitants. Indeed, all production factors are influenced by the city: the cost of labour is conditioned by supply and demand on the labour market of Kabul. Water supply (in addition to climate problems) is determined by the increase in domestic water consumption in Kabul as a result of population growth. The scarcity of water resources forces farmers to find alternative solutions.

The increase in land pressure creates a demand for building land which encourages landowners to sell. Thus, the fact that this agriculture is mainly based on tenancy agreements makes it all the more fragile. This precariousness of land tenure also affects farming landowners, who are threatened by land seizures within the city expansion plan. Farmers are not very inclined to make significant capital investment in their fields (greenhouses, arboriculture, etc.) if there is little certainty that they will be able to benefit from the advantages of these investments in the foreseeable future. This explains why UA is primarily directed towards annual crops.

Moreover, land price is calculated on the basis of building cost opportunity. The cost of purchasing and renting land are thus completely disconnected from the profitability of the agricultural activity. To compensate for these costs, farmers tend to specialise in order to generate higher added value higher than that obtained by growing food crops.

In this type of production system, it is imperative that farming generates a sufficient income to refund the expenditure in inputs, labour, infrastructure (in the case of floriculture), the farm rent (if tenant) and to buy the family food which cannot be produced on the fields. UA is not a surplus sale but a production mode which privileges cash crops to the detriment of home consumption.

5.1.1 Reasons why agriculture continues to exist in Kabul

In addition to the geographical advantages of proximity from which UA benefits, the fact that agriculture continues to flourish in Kabul is explained by the current economic situation of Afghanistan.

Proximity to the city

UA has comparative advantages compared to commercial farming carried out in more distant areas. It profits from facility of exchange which limits the transport costs and the expenses related to intermediaries. This proximity to the market means that farmers do not have to invest in storage and the possibility of selling produce quickly offers a larger range of possibilities in terms of type of production. Crops that are sensitive to transport and perishable, such as peaches, aromatic herbs or lettuces, are possible in Kabul.

Access to the tools for modernisation is easier downtown. The proximity of an urban centre gives access to inputs, particularly improved seeds or new horticultural varieties (seeds of Iranian and Pakistani vegetables; various species and varieties of flowers). Access to mechanisation is also easier; it is simple to hire a tractor or a threshing-machine downtown. Thus UA is more innovative and can differentiate itself from agricultural systems elsewhere; it can adapt more easily and compensate for its shortcomings.

The existence of a non-agricultural population which is able to save money, in particular within the farming community, makes access to credit easier and less expensive. This means that farmers are not necessarily obliged to sell their livestock or land, or identify alternative sources of capital when they wish to invest (wells, greenhouse, etc.).

Urban unemployment rate and the agriculture opportunity cost

Contrary to other urban activities (wage earners for example) or subsistence agriculture, urban family farms are able to absorb any surplus family labour. Given that the unemployment rate is estimated at 35-50% in Kabul, the opportunity cost of work is low (the value of work is close to zero). This additional labour presents little value so investing it in farming activities therefore represents a profit for the family[51].

In Afghanistan, the development of truck farming is limited by the lack of labour force. However, in Kabul, labour force is not a limiting factor, indeed, quite the contrary, the offer of work exceeds the demand.

These unemployment figures are an issue of concern for farmers, who are often illiterate and wonder what other job opportunities are available to them. Thus they persist in their trade, more by defect than choice. Those who do not have the means of finding alternative work worry about what the future holds for offspring and hope to be able to hand down the land so that they will not be obliged to look for work elsewhere. The opportunity cost of their own work seems to push them towards agriculture. Indeed, farmers confirm that it is more interesting financially to work the land to be a daily worker.

Owners' choice to preserve the land

UA exists in Kabul because farmers still manage to change their production system and crops to generate a larger income and thus resist the urban pressure. They pay sufficiently high rents so that the landowner keeps his land or so that it is still beneficial for farming landowners. In highly specialised market-gardening areas, UA is a godsend for landowners who rent out their land. They will hand onto their land as long as the farming incomes remain high enough.

Moreover, after so many years of war, land is regarded as a safety net, a means of feeding your family, a tangible asset. Some owners are likely to keep their land as long as the country's stability is questionable. Others, living abroad, rent out their fields while waiting to maybe return to settle in Kabul. Others keep their land out of family tradition. Apart from a few exceptions, all the farmers that we met came from farming families and see this activity as a traditional that has existed in the family for generations. Moreover, it is not socially acceptable to sell land which has been in the family for a long time[52].

5.1.2 Urban agriculture and its impact on the city

Urban agriculture is simultaneously concurrent with the city in the use of resources and complementary in the use of space and waste.

Agriculture which goes against the city needs

- *Competition for water and land*

According to Mr. Khulmy[53], Kabul agriculture represents approximately 95%[54] of surface water consumption of Kabul. It also consumes a lot of ground water, the only source of water which is available all year. Because of the reduction in surface water availability, ground

[51] Considering that intensification in labour generates a yield profit in the case of specialised crops.
[52] This last point needs to be reappraised seeing the amount of land that has already been sold. However, it remains valid for a certain number of landowners. In the same way, it is true that the "tradition" continues because specialisation was possible.
[53] National responsible for hydrology in the Ministry of Water and Energy.
[54] Approximative value not checked on the field.

water is now the main source of drinking water for the city's inhabitants (BGR, [2006]). Almost 60-70% of this population directly draws this water from wells (Grinnell, 2004).

The rate of water consumption is higher than the rate at which the water table refills. It thus appears that it is necessary to reduce the quantity of water extracted from the subsoil. Drinking water is obviously an essential need for the city's inhabitants and these needs will continue to grow: indeed, it is impossible to reduce them. It is therefore valid to ask whether UA still as a place in Kabul? At least, are the current irrigation systems still desirable in a city where access to water is one of the major problems?

The population of Kabul will continue to rise but the geographical extension of the city is limited and indeed, the city is already facing a problem of space. There is the possibility of extending the city in the outskirts. However, the networks and means of transport that are being developed are not yet adequate to prompt people to settle far from the city centre. The city's vertical development is limited because of the risk of earthquakes.

- *Not fundamental in food security*

The city contributed to feeding the Afghan population during Nadjibullah, the civil war and the Taliban regime, but this is no longer the case. According to Levron (2006) "*There are not strong interactions between the agricultural zones located in the hinterland of the city (the majority of the foodstuffs are imported)*". In the future, Kabul is unlikely to preserve its feeder role as the agricultural perimeters are too constrained and the population of Kabul is too large.

It is legitimate to wonder about the future of this agriculture especially when we can see that it is in strong competition with the city for vital resources, such as water and land, i.e. from an urban point of view, drinking water and housing. Moreover, this agriculture only participates to a minor extent in feeding the population.

However, it is too limiting to categorise UA as a "useless competitor" for Kabul population.

Complementary and proximity agriculture

In this section, we will look at the 'secondary positive effects' of Kabul UA.

- *City purification*

UA is part of the city's ecosystem. Kabul is a dusty and dirty city. The irrigation network, planted with trees brings shade, freshness and moisture[55] into the city[56]. The planted areas holds the soil together and thus limits dust. The air quality is improved.

This agriculture uses human waste which is collected in the street where the toilets of each house emerge. Without this process, the toilets would smell, and the waste would seep into the water table[57]. The lack of cleaning in the city means that pollution levels are high[58]. This purifying system is doubly beneficial since it allows farmers to save on investing in artificial fertilisers.
However, whereas in the past UA had a true impact on the city, today farming activities have shrunk to such an extent that these secondary effects have become negligible.

UA, in a deforested and highly built-up urban area, brings a little greenery, open spaces and in general improves the landscape. Without overly focusing on Western concerns, this agriculture can contribute to the quality of life the Kabul inhabitants. As we saw in section 2.3, Afghans attach a great importance to the garden and are enthusiastic picnickers.

[55] The relative humidity is 40% for the dry months and 71% for the wet months.
[56] Discussion with Habib Haider (Advisor to the Minister of Agriculture for the horticultural project)
[57] cf. ACF study which says that the Kabul water table is 50 times more polluted than the Seine.
[58] Recent analyses on the under ground water quality indicate 50 to 70% of E. Coli in this drinking water, which means a very strong pollution caused by human rejections, www.bgr.de.

However in this city, there is little space available for parks and agricultural areas provide the vegetation that urbanisation has failed to bring.

These certainly are not the main concerns for Kabul in the current context but in a basin city which will continue to expand and which has record levels of faecal particles in the air, it is important to protect, and even restore, the quality of the air and of living conditions in general.

- *Freshness of the products*

Products which are grown near the markets can be consumed in less than one day after harvest and thus retain their nutritional value. However, a great majority of the population does not eat fruit and vegetables but makes do with bread and rice (Grinnell, 2004). There are no links between the poor Kabuli population and market-gardeners, as these populations do not have the purchasing power to buy vegetables.

- *Source of employment*

In a country where the secondary sector has been destroyed and still remains very weak, agriculture continues to employ the vast majority of unqualified labour. Market-gardening agriculture can use this labour in quantity and "quickly".

Agriculture thus represents an employment pool which has the capacity to absorb the labour force when unemployment is high.

The available external labour enables farmers to employ daily labourers and thus specialise in crops that are labour demanding. The quantity of chemical inputs used for fertilization or weeding depends upon the availability of workers in the family and their opportunity cost[59]. Indeed, human waste is free but collecting it and spreading it takes time whereas the urea has a higher purchase cost but is simple and easy to use.

The progression of UA towards more negative than positive externalities needs to assessed alongside the increased density of Kabul population. There is a paradox between the change in demand for an increasingly specialised agriculture and the drop in access to water for this same agriculture which is increasingly demanding of water.

UA is a fragile system which rests on a fine balance between what the city can provide and what the city requires. It will be interesting to see how this balance will evolve. Many farmers intend to continue their trade for a long time. Will they be able to do so, how, and for how long?

5.2 Assumptions on the evolution of agriculture in Kabul

5.2.1 New factors of change

Internal factors

The construction of roads in Kabul will change the shape of UA in the future. Areas that will be connected to new roads will see land prices soar. This access will facilitate the collection of waste in the city and selling produce at the market. Thus, farms that are already engaged in market-gardening on a small scale will specialise. Such is the case of Part Khel.

The drying up of wells or blocking of irrigation canals will mean that some UA areas will be swallowed by new building works. The drop in the ground water level will have an impact on the cost of exploiting subsoil water. Moreover, soon all the wells will have to be recorded and

[59] According to what pays more between a) a family member occupied in weeding who thus cannot undertake any other activity or b) investing in inputs which means that family labour is available for other activities.

agricultural wells will be regulated to a certain depth. It is possible that these laws will place restrictions on the use of wells, obliging farmers to change their practices or their crops.

As is already obvious in the extension plan (cf. Annexe 10), it is just a question of time before much of the arable land will disappear. On this plan, no agricultural land is included in the protected areas, only the hills and mountains feature.

Will the UA limits be pushed back further towards the outskirts? Or on the contrary, will land pressure be reduced in the city centre as inhabitants move towards the outskirts? However, with an expected growth of 5% (2% of migrants and 3% of natural growth), i.e. an extra 150,000 people each year, we can presume that land pressure will increase both inside and outside Kabul (the World Bank, [2006]). Will the urbanisation campaigns give rise to a new UA within the limits of the new city?

External factors

The construction of transport infrastructure linking Kabul to the rest of the country will facilitate the import of produce towards Kabul. The asphalting of the Jalalabad road which should reduce the truck transport time between the two towns from ten hours to three hours will encourage the arrival of imported goods from Jalalabad, a city with a warmer climate and easier farming conditions. The development of networks around the close outskirts of Kabul will give these areas the same advantages in terms of proximity to Kabul for UA without the disadvantages, seeing that land pressure is not so high.

The new agricultural policy exposed in the Master Plan is strongly focused on horticulture development and more particularly arboriculture. It seems that it will especially focus on areas such as the large productive plains (e.g. Shamali and Logar). The whole province of Kabul is already specialised in cash crops (vegetables, flowers, vines, fruit) and will benefit from this new policy to specialise further still. Afghan agricultural production, for reasons of quality, varieties, conditioning, processing and transport, is not adapted to export[60]. Thus, this type of farming in the outskirts will not direct its merchandise at export but rather the Afghan markets, and in particular the Kabuli market, creating strong competition with UA.

Afghanistan's aim to enter the WTO[61] and thus enter into a free trade dynamic would remove customs duties and make it possible to import goods at a cheaper price.

5.2.2 How will urban agriculture adapt?

UA will have less space and water and will have to deal with increasing competition. We put forward the following hypothesis on how it will adapt and what changes will be introduced.

UA will have to be innovative and find ways of using less water, in particular by improving the effectiveness of irrigation systems. Farmers will have to look at alternative techniques such as mulching or hoeing as a substitute for watering. The choice of species and variety will be directed towards those that need less water. Farmers will become more economical with their water use, because of scarcity and increasing cost.

Intensification and specialisation will continue to increase. Cereals, fodder crops and the potatoes will undoubtedly disappear. In terms of vegetables and flowers, farmers will diversify and innovate, maybe with cut flowers, perishable food products, etc. Farmers will have to focus on a niche market (expatriates, restaurants, Afghans who want to use the food produce that they were used to cooking with abroad). Another possibility would be to extend the production cycle by developing out of season crops.

[60] Discussion with Rahman, ICARDA
[61] World Trade Organisation

This intensification will continue to see the disappearance of livestock breeding and thus part of the fixed costs (the animals must be fed and looked after all year round to provide work at one period of the year). Pack animals will be replaced by tractors and rented vehicles. Hiring farm machinery or collective purchase will take preference over individual use.

The production chain will need to be better structured, both in terms of supplies, expertise and selling, so as to resist competition. Farmers organisations could be set up to both reduce the cost of inputs thanks to collective purchase but also to obtain supplies of more powerful or innovative vegetable material thanks to collective risk taking and sharing of knowledge. This exchange of knowledge exchange would allow farmers to make important advances and adapt more quickly. Organising a system for selling UA products is another means of resisting the pressure of imported goods. Indeed, Kabuli vegetables would still have a comparative advantage in terms of price and freshness compared to vegetables grown in other provinces or Pakistan. However, the small volume means that even though they are less expensive, traders might prefer to import. If Kabuli producers organised themselves to sell their produce as a group, it might be easier to guarantee their sales. Moreover, establishing a contract with the purchasers would enable them to adjust their production to the demand or at least to harvest when imports of the same product are low.

However, in Kabul very few producers are organised in this way, maybe because they do not see what advantages this could bring but also because this form of organisation is not traditional in the farming community.

In order for urban agriculture to survive, it is important for the government to control and offer guarantees on the quality of inputs, so that this agriculture can improve. Indeed, farmers hesitate to invest in new seeds and pesticides as they are often of poor quality. Thus state controls would ensure quality and would encourage the farmers to use them.

Improved land security where the farmer has a true contract which gives him a guarantee that he can stay on his land for a determined length of time and which fixes a maximum limit for the farm rent so that it is worth his while to continue farming would help producers to invest in their profession. It would allow farmers to plan their production with a longer term outlook and give the farmer hope for the future. In a more utopian way, if land access was ensured to all farmers, agriculture in Kabul would be guaranteed a future. Given that it is a family-based agriculture, a farmer's strategy is to stay on his land as long as he can and he will endeavour to preserve this system and thus provide a secure future for his children. This is a family-based rather than a capitalist intensive agriculture, in the way that farmers try to preserve their farms in order to hand down the asset to their children. However, land security depends primarily on government policy and the will to preserve urban agriculture, which at present does not appear to be a priority in Kabul.

5.2.3 Are greenhouses a means of intensification in Kabul?

The climate in Kabul is a limit for some crops and reduces the duration of the production cycle. Greenhouses allow crops to benefit from the sunlight (high levels of sunlight even in winter in Kabul) while being protected from the cold. Thus greenhouses allow farmers to develop crops out of season and plants that are sensitive to the cold all year round, such as flowers.

A greenhouse requires little space and has a high added value. However, setting up a greenhouse means that farmers must own their land or at least have the guarantee that they can stay on their land for a certain amount of time.

What is the potential of greenhouses?

It is apparent that greenhouses are a viable option for Kabul since some farmers are already using them, building them of their own initiative and with their own funds.

The majority of greenhouses that exist in Kabul are made out of brick and wood, with only the southern face plasticised. In these greenhouses, we mainly find flowers and to a lesser degree vegetable seedlings that will be transplanted in open fields. These greenhouses are personal initiatives. Other greenhouses have been built with NGO backing, such as the FAO who has tunnel greenhouses where vegetable are grown.

Thus, it appears that floriculture has a stronger potential to be developed in greenhouses than out-of-season crops, which require more space and have less added value. However, the out-of-season crops arrive on the market when access on the road networks is poor and where competition is weakest. It is important to remember that in Kabul, the price determines customer choice (McNamara, 2002) and if the price is too high, the produce will not be sold.

Seedlings grown in greenhouses can be transplanted as soon as the outside temperatures allow. This shortens the production cycle in open fields, making it possible to harvest earlier and thus sell one's produce ahead of other farmers for a better price.

6 Conclusion

There is some confusion between urban agriculture and farming in the outskirts, which explains why some of the specific characteristics of UA are overlooked and why UA is often forgotten in agricultural and urban policies. Admittedly, UA does not represent a major element of the agricultural sector but it plays an important role in the life of the city, and therefore merits greater consideration.

UA is currently having to deal with high land pressure and a shortage of water resources but benefits from a high demand for horticultural products.

Kabul UA can be identified by its strong focus on cash crops, especially short cycle and high added value crops. In general, UA in Kabul is practised by farmers whose families have been living and farming in Kabul for generations.

This agriculture would benefit from a better organisation between farmers, especially in terms of marketing. There is a need to structure the production chain for fruit, vegetables and flowers. Farmers do not have the capacity to fully satisfy the market demand because they do not have sufficient knowledge about what sells well and when, nor the necessary technical knowledge. A better structuring requires an impetus from farmers but also from government policy.

The objective of this study is to assess the Afghan post-crisis situation, although it is relevant to ask whether today Kabul is really in a post-crisis situation. Improvements in the situation on the ground are proving tardy (Grunewald, 2006).

So, will UA encounter increasing land pressure and evolve towards an even higher specialisation as has been the case over the past five years? In this case, how much longer will family-based UA continue to exist? How will UA evolve? Will it succeed in resisting the deterioration of natural resources due to urbanisation or to increasing land pressure? Or to the increased competition? Or indeed will it turn to speculative choices rather than to agronomic choices?

An alternative scenario is that the situation in Kabul may deteriorate once again, with the city's inhabitants forced to flee. Will UA return to a more subsistence form of farming?

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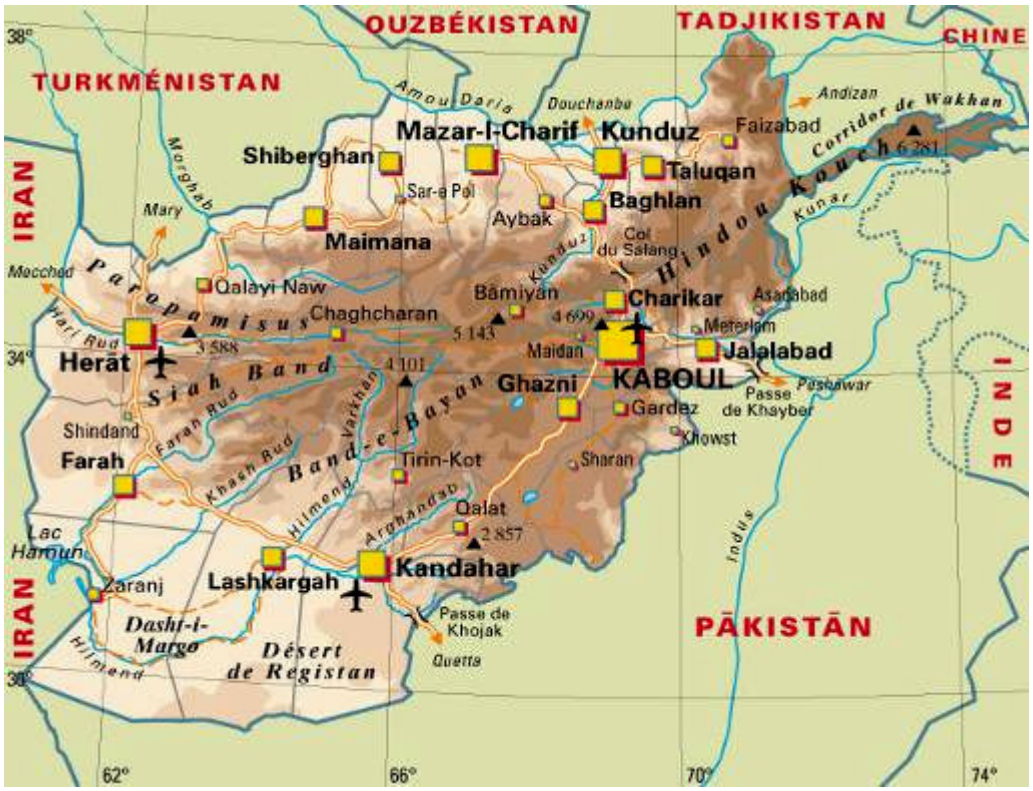
ANNEXES

Annexe 1: Map of Afghanistan



Source: www.idcb.com/pays/afghanistan

Annexe 2: Terms of reference

INTERNSHIP: GROUPE URD/ GERES (Kabul-Afghanistan)
COUNTRY: AFGHANISTAN (Kabul city)

PRESENTATION OF THE STRUCTURES

This internship is proposed by Groupe URD, a research, evaluation and training institution and GERES an implementing NGO.

Presentation of Groupe URD and of the LRRR project
Groupe URD (Emergency Rehabilitation Development) was founded in 1993 with the aim of improving our understanding of the complexity of emergency contexts and developing new operational procedures. Groupe URD functions as a non-profit research, evaluation and training institute. Its activities are based on a "learning cycle".

Groupe URD's core team is composed of eighteen members of various nationalities, from Africa, the Americas and Europe. The support team is made up of consultants from a range of disciplines, such as Agronomy, International Humanitarian Law, Medicine, Nutrition and Management.

Evaluations: Groupe URD regularly carries out several major evaluations for donors, UN agencies and NGOs covering a diversity of contexts in Africa, Asia, Latin America, and Europe/Caucasus.

Research and publications: Groupe URD runs several research programmes, including the Quality Project, the Global Study on Participation and the "War in cities, Cities at war" project. All research results are published in well-known specialised publications and are widely diffused. Groupe URD's web site presents all these activities and publications (www.urd.org).

Training: In order to re-inject the lessons learnt in the field back into the humanitarian sector, Groupe URD conducts over 130 days of training per year for international, national and local NGOs, UN agencies, bilateral donors, and in various universities.

The LRRD Project
The LRRD is a two year project funded by the EC. It aims to draw lessons from current experience to inform policy and programmes, for both NGOs and governmental institutions in Afghanistan. It seeks to do so by introducing innovative techniques, methodologies and concepts. The LRRD project will focus on the 3 following sectors :

- Rural development sector / Agriculture
- Health sector
- Urban sector

LRRD Project has three main objectives:

- Learning and sharing lessons in this period of political and technical transition, through iterative multi-sectoral evaluations.
- Increasing and sharing knowledge and experience by carrying out applied research in rural and urban settings in specific fields (including food and economic security, health, housing and habitat), with a focus on key issues as identified during the lesson learning process. This study is part of this component.
- Contributing to the capacity building efforts of the relevant ministries, Afghan NGOs and universities through training.

The project comprises:
Applied research: Improve the knowledge related to farming systems, urban systems, health issues, in partnership with the aid community.

Evaluation: Visit regularly a set of projects and areas in order to follow the evolution of the programmes (in terms of appropriateness, relevance to the evolving context), and the trends in terms of impact.
Training session: Strengthen local capacities in the fields of assessment and ex-post evaluation.
Communication system: Share the information collected and the results of the research and evaluation to the most extensive set of stakeholders. This will entail various publications, workshops, as well as an end of project International Conference.

Presentation of GERES

GERES, a French association created in 1976, has been working since the 1980 in the Hindu Kush Himalaya region (North West of India, Nepal and China). In these countries GERES has been mainly involved while supporting local partners in rural areas in two ways:
Introduction and diffusion of passive solar architecture for domestic and public building in order to improve the quality of comfort and to decrease the energy consumption (wood, cow dung...).
Development of project to facilitate the improvement of income generating activities and the implementation of new ones: solar greenhouses for vegetables production in winter season, solar poultry farms, food storage, wool processing, improved drying food …

GERES employed a total of 45 persons in the headquarter and its representations. Nationals represent 70% of the staff.

In Afghanistan, GERES worked since 2002. GERES projects focused on the development of energy efficiency through the rehabilitation and construction of domestic and public buildings, solar greenhouses as well as food processing (drying fruit). GERES collaborates as technical partner with implementing international NGOs (DAI, AFRANE, AFRANE development, AKDN, ACTED, SOLIDARITES and MADERA), GO (GTZ), local NGOs (KABURA, RRA, AREA…) and Ministries (Ministry of agriculture and animal husbandry, Ministry of health and Ministry of Education). Its projects cover the region of Kabul, Badakhsan, Oruzgan, Wardak, Bamyan, Kapisa, Parwan, Samangan, Loghar and Laghman.

Since 2004, GERES in partnership with KABURA has started a pilot project of income generating activities through protected cultivation (Greenhouse) in the district seven of Kabul (Djangalak). Ten greenhouses or trench was build for vulnerable families. Regular training occurred to allow the beneficiaries to develop technical skills. With KABURA a regular monitoring was assured.
As a result, the beneficiary families are able at the end of the project to conduct protected cultivation (vegetables and flower) and release some benefits. The beneficiaries after one year and of half are able to be autonomous in the activity either for the technical management or for to get the input (seeds, tools…) to assure the running the activity.

This pilot project will be developed through a new project of implementation of 30 greenhouses in the peri urban area of Kabul. This new project will start in February 2006.
The objectives of the project are

- Increase the income of poor households through development of new agricultural activities.
- Empowerment of women by practicing income generation activities
- Increase the vegetable consumption during winter
- Support the local market seller for greenhouses cultivation produces.

Before implementing the action, GERES and KABURA would like to implement a diagnostic in order to redefine the action if it appears to be not any more adapted to the actual situation. The proposition was designed in summer / autumn 2004.

OBJECTIVES

In the framework of this new project, GERES would like to get a better vision of the agro system of the peri-urban area of Kabul city. A deep study will enable to have a full understanding of the agricultural situation before implementing the project in the peri-urban district of Kabul.

Moreover the study will aim to study more precisely:
- to identify the vegetable and vegetable seedling production
- to identify the flower seedling and flower production
- describe the production system related to these productions
- to make a typology of the producers taking into account the decision making processes
- identify the channel of marketing

The study will focus in priority on the districts where GERES and KABURA plan to implement the "greenhouses" project, that is district 6, 7 and 13. Other areas should be also visited to see if the chosen areas are the most relevant.

PRODUCTION EXPECTED:

- Mid term draft orientations answering the topics studied
- Final report in English.
- Restitution to GERES/ Groupe URD staff at the end of the training period.
- Restitution to the national stakeholders involved in the agriculture/breeding and more generally Rural Development sectors at Afghanistan National level (Ministry of Agriculture and Animal Health, FAO, Dutch Committee, and relevant or partners NGOs involved in breeding sector and Rural Development in Afghanistan) at the end of the training period.

- II - PROFILE OF INTERN REQUIRED / LANGUAGE REQUIRED:

- Student with a master degree in agriculture
- Good understanding of the methods of agrarian systems analysis.
- Good understanding of the methods of market analyses
- Interested in the relations urban-rural
- Fluent in English.
- Interested to live and work in a Muslim environment
- In order to prepare their “experience”, the students are very encouraged to realize a desk review of the study to GERES and to Groupe URD.

Annexe 3: Proposal of the greenhouses project

Action No:2

(a) Title :

Income generation for households in poor peri-urban districts of Kabul through innovative agriculture activities

(a) Precise location within the beneficiary country :
KABUL: District 6, district 7 and district 13

(b) Total cost in EUR[62] :
144,610 Eur

(c) Local Partner (name and partner number used in section III) :
KABURA n°1

(d) Brief description of the context of the action :

Critical situation in several district of Kabul

The repeated conflicts has affected the peri-urban area of Kabul implying the migration of household in other part of Afghanistan or abroad (Iran, Pakistan..). Since the fall of Taliban in 2002, The population of Kabul tripled. In district 6 and 7, tadkik and pashtou families have come back to their houses partially or completely destroyed. Consequently, a large part of their income is intended to renovate or reconstruct their property. In this reconstruction area, markets are developing rapidly with little shop and services (carpenters, smiths, potter).

The district 13 has always been a vulnerable district. Its inhabitants are from Hazara, ethnic minority in Afghanistan. The households income of this district is based on daily work and is less than 40 $ per month. There is no skills and inhabitants their income opportunities is mainly daily labor (construction) mobile fruit and vegetable man and carry load with their "Karachi" rickshaw. With the decrease of humanitarian and relief assistance, the livelihood remain precarious. More sustainable and mid, long term solution is required. Few coping mechanism has been developed and unemployment and regular price increase (rent, fuel, …) reinforce the vulnerability level.

Opportunities thanks to news agricultural peri-urban activities

This new population has raised the consumption demand more particularly in food. Vegetables are coming mainly from Pakistan and the vegetable production is weak in Kabul. KABURA, a local NGO started in 2004 a off season cultivation project in part of district 7 with implementation of 10 greenhouses. The first phase of the project showed a good acceptation and involvement of families and local responsible.

(e) Overall objectives and specific objective of the action :

Overall objectives are to :

- Increase the income of poor households through development of new agricultural activities.
- Empowerment of women by practicing income generation activities
- Increase the vegetable consumption during winter
- Support the local market seller for greenhouses cultivation produces.

The specific objectives is to:

- improve the livelihoods of 30 urban vulnerable families in kabul peri-urban area through the sale of greenhouses and trench produces (seedling, flower cutting, vegetable and flower) in Kabul market.

[62] Excluding contractual costs and administrative costs.

(f) Description of target group(s) (social category and economic situation, age group, gender, etc.); estimate of anticipated number of direct and indirect beneficiaries :

Target group is especially from vulnerable population of each district:

- Women, heading of family and/or members of family with disable (adults) and/or member of family with large number of children and/or members of family with none source of income or daily work. The number of direct beneficiaries are 40 women and their family (about 400 persons) : about 10 women in each district. The cultural and social context of this district imply that women are based inside the home compound. The action will give them the opportunity to implement an income generating activity without defying the social and cultural rules. Men of each household (40 household) would be involved in the training session and in the support of marketing activities. The age bracket of direct beneficiaries would be from 20 to 50 years old.

Other beneficiaries are:

- Seedling and flower cutting seller and/or wholesaler of each district will be supported in their business to develop their activity.
- Related family and friend will benefit indirectly from the activities as the social tradition in Afghanistan is to share produces and distribute benefit in nature..
- Training sessions will be opened to any interested and motivated individual (women, men, youth people, …). Experience demonstrate that other persons (which are not direct beneficiaries) want to participate to training sessions. The population of each district will be concerned with this local dynamics that is 4.000 households.

(g) Description of main activities :

Mobilisation of the district representatives and beneficiaries identification

The action will be presented to the local representative (Wakil) to assure a better acceptation and support in the implementation of the action. After a clear identification of the target group and beneficiaries selection will be conducted jointly by KABURA and GERES according to common criteria.

Demonstration of the greenhouse and trench cultivation activity

Field visit and exchange seminar would be organized between the beneficiaries and the household which has already handled greenhouses and trench cultivation in Djangalak district. This local experience sharing is intended to support the beneficiaries in starting up of their activity.

Training of future greenhouse users

Visit and discussion to support household in the activity design and management:

Beneficiaries are supported in the choice of vegetable and flower variety to assure a good economical profit and market diversification. Moreover, they are stand in the planning of their activity.

Training on greenhouses cultivation, nutrition and economical approach

Implementation of new agricultural activities.

Design and construction of greenhouse or trench in the compound of beneficiaries. Each greenhouses and trench is adapted to the compound configuration (attached, improved, size, ….)

Activity Monitoring

The beneficiaries are supported in the development of their activity through regular visit. Advise and support is brought to solve the problem faced, improve the quality of the handling (productivity, disease and pest control). Information is spread and problem solving discussion conducted to support the beneficiary in its marketing strategy.

Marketing promotion of products in district market

Survey to understand and quantify the seedling, flower cutting, flower market at the district level. Organisation of the beneficiaries to find new outlet and understand the chain. Support of the seedling and flower cutting local seller in the organization, promotion of their stable.

(h) Concrete results expected:

The concrete expeted results are :

- 10 greenhouses in the district 6, 10 greenhouses or trench in the district 7 and 20 greenhouses in the district 13
- At the level of each district, 40 persons (men and women) will be trained on the vegetable, flower, seedling and flower cutting production, that is a total of 90 persons
- 40 household (400 persons) will increase their income of minimum of 30 euros per month (depending on vegetable and flower choice as well as greenhouse size (from trench 6 m² to greenhouse of 50 m²).
- 40 women empowered
- The offer in vegetable seedling, flower cutting increase at the level district and fit the market demand.
- 40 household supported in their marketing strategy
- 10 seedling and flower cutting sale and/or wholesaler business developed

The induced effects

- The distribution and share experience tradition in likely to induce an effect on 240 related household by an improvement of food security and an sensibilization on flower, vegetable, seedling and cutting production.
- The local dynamic and market will be strengthened by the introduction of adapted new techniques and new produces.
- Local masons and carpenters trained on greenhouses and trench construction
- Awareness of extended related families and friends raised on vegetable and flower production and sale benefits

(i) The action is part of a larger programme:

No

(j) Sustainability once EC co-financing has come to an end (financial, institutional and social/cultural aspects, where applicable) :

Independent management of the activity by the beneficiaries :

The beneficiaries have conducted the greenhouses cultivation during two winter and two spring with training and support of agronomist and field extension officer. The marketing strategy have been reinforce and support at the household level to assure economical viability of their activity (investment, sale, benefits management)

Local partner ability reinforced to replicate action :

KABURA capacity would be reinforced in terms of project management with the competence to conduct peri-urban development project (beneficiaries identification, training, activity management, monitoring, evaluation and capitalization).

(k) Monitoring and evaluation mechanisms :

Monitoring assured through periodic field visit and monthly report by GERES Kaboul.

Evaluation by GERES France at mid term and independent external evaluation at end of the project with impact assessment of the activity.

(l) Human resources and principle means proposed for the implementation of the action (including credit and/or revolving funds) :

KABURA : One project supervisor agronomist, one male field extension officer, one female field extension officer, one logistician

GERES : one project coordinator, one agro-economist volunteer, one local agro-economist

Transport : Car rental (GERES), Taxi (KABURA), one motorcycle (Kabura)

Office: Kabura office rent, Geres office rent

Investment Fund : Mean to support beneficiaries in implementing their activities

(m) To whom will movable and immovable assets acquired in the framework of this action belong once EC co-financing has come to an end?(including credit and/or revolving funds)

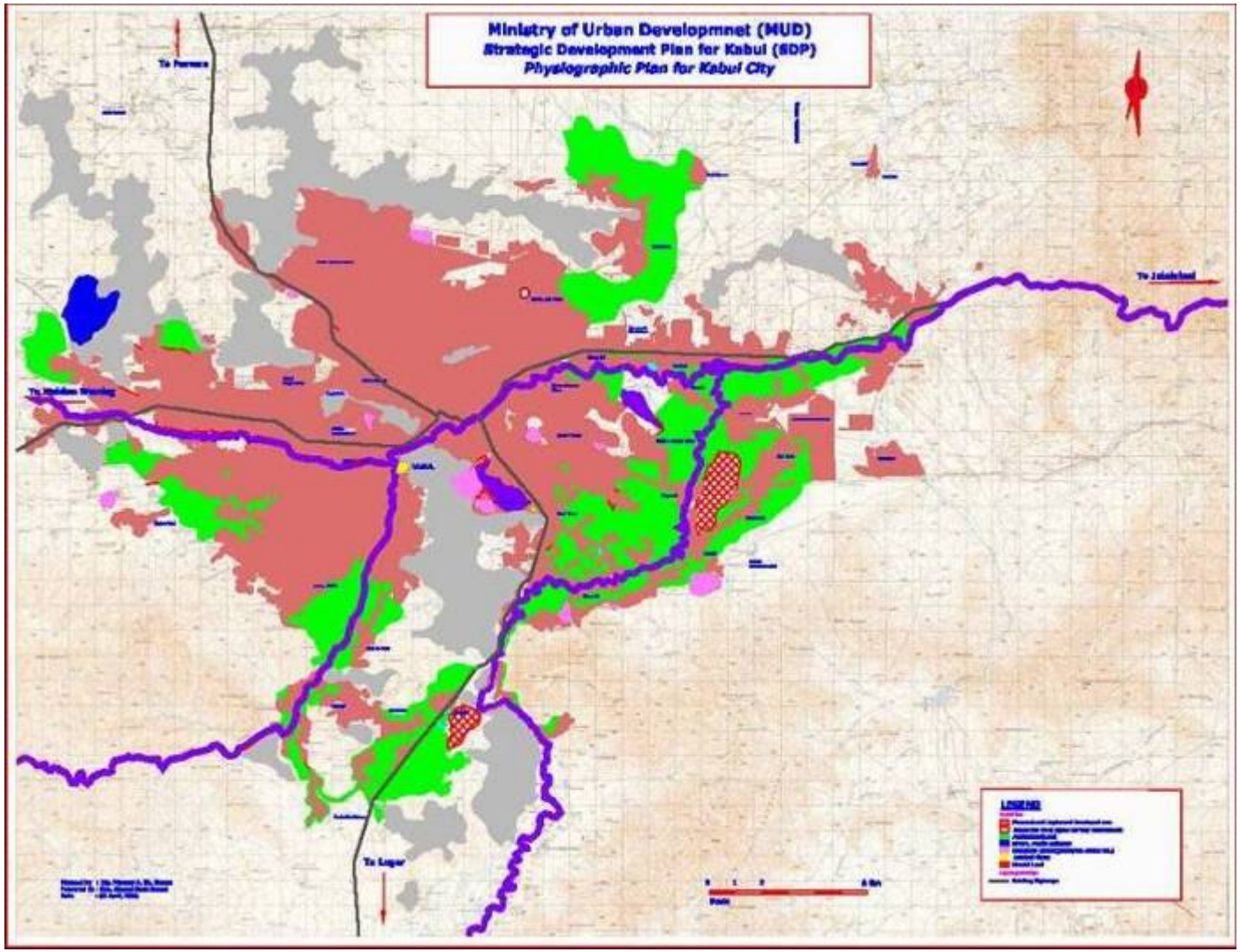
Greenhouses – trench: Beneficiaries

Motorcycle and Office supplies: Kabura

(n) Duration (in months) :

24 months

Annexe 4: Map of Kabul from the Ministry of Urban Development



Annexe 5: Questionnaire

1. N° 2. For how long has your family been here?
3. Date 4. District
8. From which tribe are you?
9. What have been the main transformations in the landscape? Hill, land, trees, NC... explanation & localisation on the map
10. What has changed in the infrastructure: canals, roads, buildings...
11. What has changed in the population? Migration, jobs, relationship, rural to citizen...
12. Where were living the farmers before?
13. Did and do the inhabitants have vegetables and fruit garden in their houses
14. Do you consider here as a village or as a part of the city?

LAND

15. Did you have more land than your F, GF when you arrived on the exploitation?
16. Do you have the same area now than when you arrived on the exploitation?
17. What was the land tenure before and has it changed. If yes, why and when
18. How has evolved the farm rent (or the part in share cropping), when and why has it changed?
19. Is it easier to find land now or before, why?
20. do you have contract with the land owner

LABOUR

21. For the same quantity of land, how has evolve the number of workers from the family
22. Since when are you using labour? Why? Do you use more or less now? Where do they come from
23. Do you have mutual help? When and why has it changed?
24. Do you have other job? Since when, why, is it part time? Which job
25. Is it easier to find a job now?

WATER

26. What were your father irrigation systems; how were the organisation and the year distribution?
27. What are your system now
28. When has it changed and why
29. How do you react in case of lack of water

VEGETABLE PRODUCTION

30. What were you growing before the war (proportion of each); what was sold? which % of the total production
31. Same during the Russian occupation
32. Najibullah
33. The civil war
34. The Taliban
35. What have you changed in your life during the war/ Taliban?
36. Production now
37. Since you have vegetables, how many harvests per year you had, and how many you have now?
38. How do you prepare the soil, since when and why?
39. How many times were you and are you going to the market per week during the production time?
40. Where are you selling your products?
41. How do you transport the products?
42. Do you have any uncultivated land?
43. What is your priority when you choose your crops: to produce food or to earn money
44. How do you choose what you'll sow?
45. Have you changed your rotations, why, what have been the effect of such a change? Plant, diseases
46. Are you using the same seeds than at the beginning? If no, why, were does the new seeds come from? in which way are they better, since when are you using improved seed
47. How were you and are fertilising the soil? changes, when

48. What were your relation with the *Kuch*i, when has it changed and why?
49. If vine/trees: type, age... was their many
50. Will you go on with agriculture, why and how?
51. Why don't you sell your land?

ANIMALS

52. How did you and do you feed them: pasture, crops, buy, go on the field
53. Do you have more animals now or before?
54. When and why has it changed?
55. Are you using your animals as a way to save your money: do you sell animals when you need money and do you buy ones when you have money?

£

56. Which investment you had done in your farm?
57. How did you pay it
58. Type of credit, from who
59. Do you regularly have recourse to credit?
60. What for
61. Type of credit
62. Have you had other sources of income that agriculture?
63. Do you have savings, before, now, how has it evolved?
64. Are you in debt frequently?
65. What is the difference between rich and poor farmers, who are they?

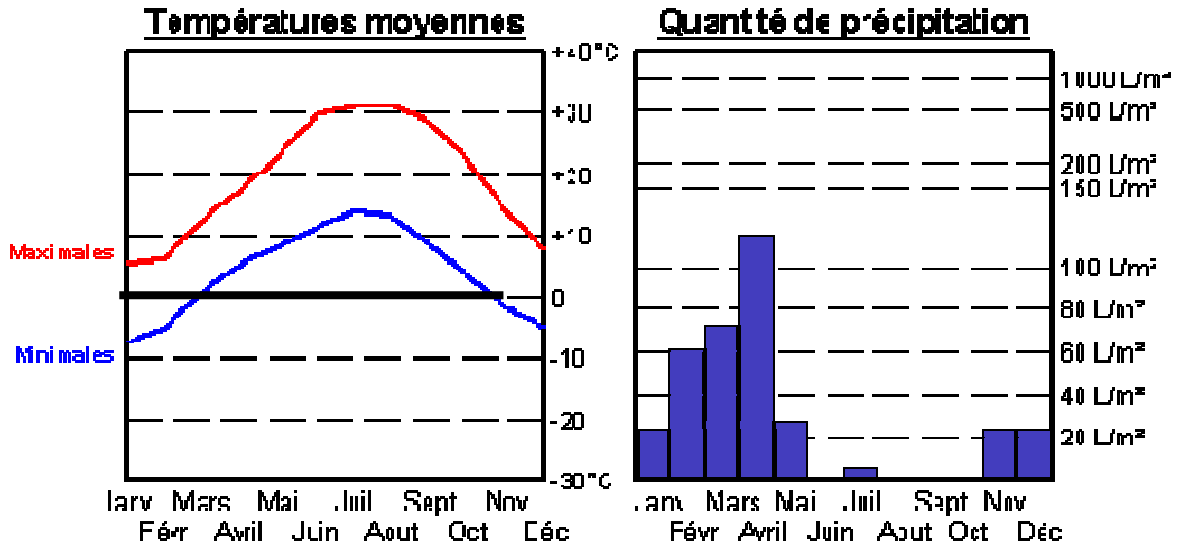
What do they do with their money?

HELP

66. Was or is the government supporting you, in which way?
67. Did or do you have any organisation between farmers (which one, since when...)

Comparison with other farmers of the area

Annexe 6: Average temperatures and rainfall in Kabul

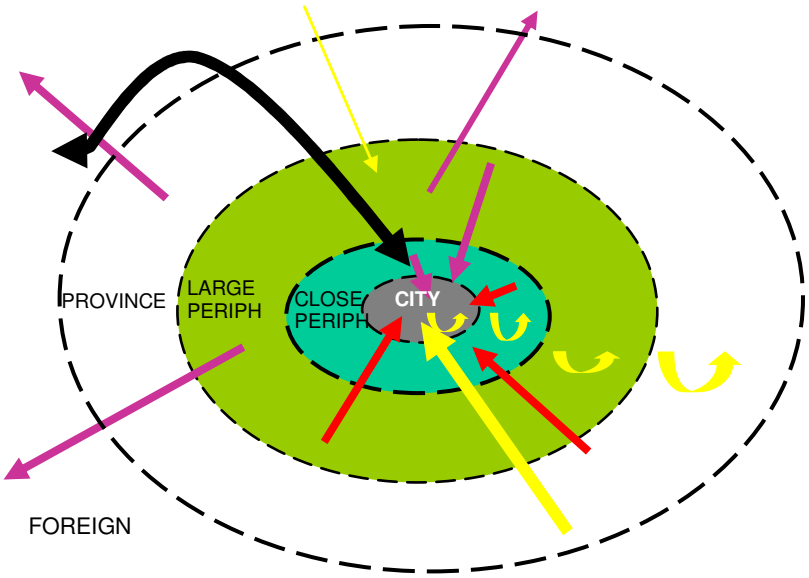


Source: Météo France 1999

Annexe 7: Zoning of Kabul

Source: C. Laillet 2006

Annexe 8: Dynamics of Kabul and its outskirts



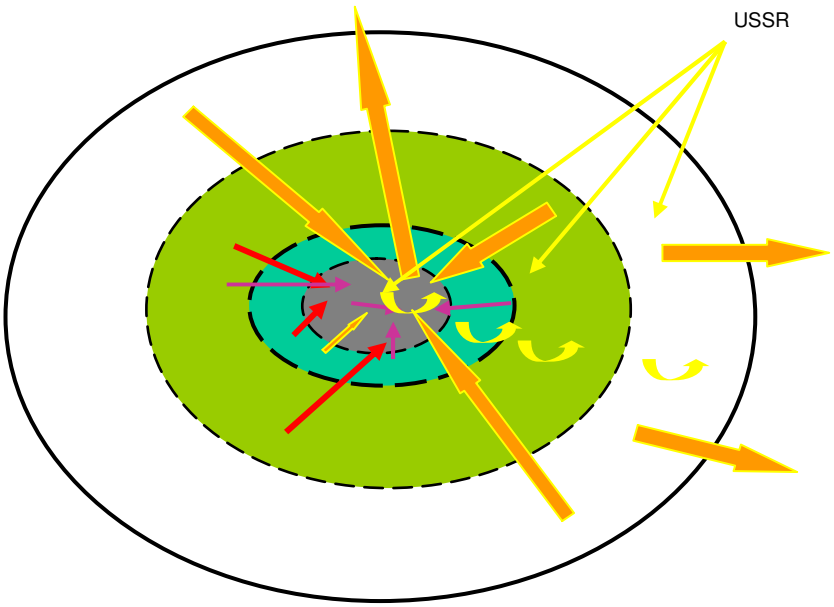
KABUL IN THE 1970s

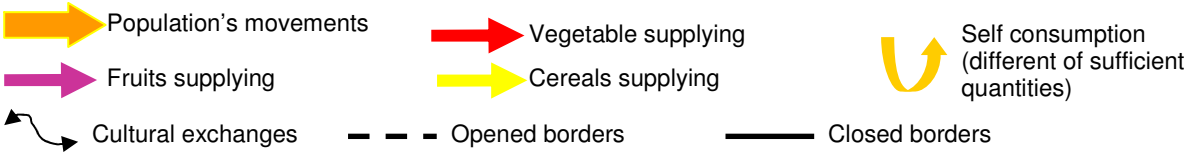
A vegetable belt supplies the city.

Agriculture is a subsistence one but a production part (arboriculture) is designed to the exportation.

KABUL, REFUGE FOR RURAL AFGHANS (1980-1989)

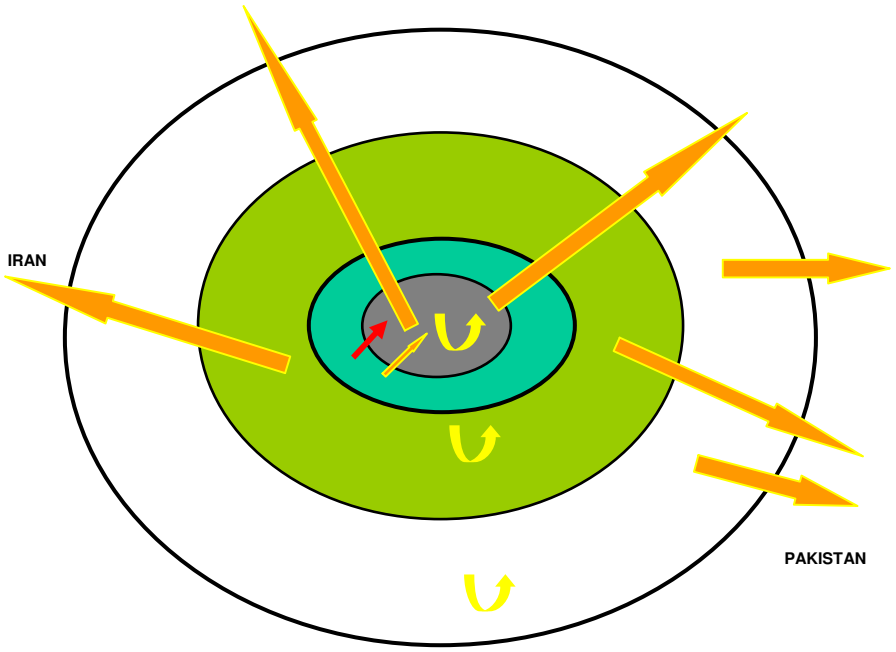
Populations flock to Kabul. The city extends. Exchanges with foreign are reduced due to the closed borders and due to the agriculture weakening. But, after Nadjibullah agricultural policy, agriculture in Kabul gets intensified.





KABUL FROM 1989 to 1996

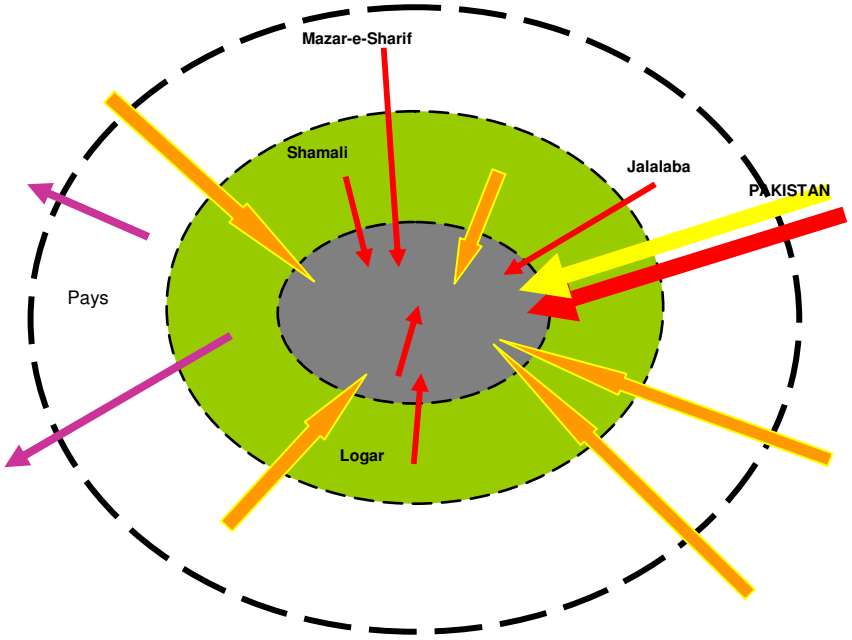
Populations flows massively; agriculture is reduced to nothing. Farmers adopt a survival strategy and so essentially do subsistence crops.



KABUL SINCE 2001

Populations previously in foreigner return to Kabul.

Borders are open again, the city is supplied by the outskirts, Afgan provinces and by foreign, especially Pakistan.



Annexe 9: Farming costs

- Agricultural tools
- Seeds of potato, improved wheat or form any other varieties they weren't growing before. But globally, seeds are produced on their own fields.
- Fuel for water pump
- Urea
- Labour or transportation of human dejections
- The tractor or animals rent for the soil preparation
- Labour for soil preparation, weeding and harvesting
- Eventually pesticides
- The threshing machine rent
- The farm rent

Big investments:

- Well or drilling construction
- Water pump
- Animals
- Wheelbarrow
- The plough or ard plough
- But it can also be personal needs for wedding, funerals, illness…

Annexe 10: City extension plan