Research for Development in the Dry Arab Region

The Cactus Flower
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Shadi Hamadeh
Mona Haidar
Rami Zurayk

International Development Research Centre
Ottawa · Cairo · Dakar · Montevideo · Nairobi · New Delhi · Singapore
In memory of
Khaled El Chab
“the Sergeant”
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Foreword

Development research witnessed in the past decades an important shift in paradigm from the traditional, positivist, scientific paradigm, which arose to bring certainty and verifiability to natural science research questions, to post-positivism which recognizes and tries to address the complex human and social problems often embedded in natural resources degradation issues. Participatory action research situates itself firmly in the latter. One of the main differences between the two research paradigms is that, while the first tends to be linear, starting with a hypothesis and proceeding to a conclusion, participatory action research proceeds through repeated cycles in which the researchers and the community start with the identification of major issues, concerns and problems, initiate research, originate action, learn about this action and proceed to a new research and action cycle. This process is continuous: participants in action research projects continuously reflect on their learning from the actions and proceed to initiate new actions on the spot. Outcomes are very difficult to predict from the outset, challenges are sizeable, and achievements depend to a very large extent on the researchers’ commitment, creativity and imagination.

This book summarizes and reflects upon ten years of participatory action research in an isolated community in northeastern Lebanon. The sustainable use of marginal lands project in Arsal was originally conceived following an initial diagnosis of the situation and was designed in response to the identification of conflicts over the use of limited and degraded land and water resources on communally managed lands. The most important conflict, dated back some 30 years when one member of the community experimented with growing fruit trees in what was traditionally a pastoral grazing area. The experiment worked and spread. Enclosure of fruit growing parcels soon became a source of conflict between fruit growers and pastoralists, who increasingly witnessed restrictions on their flocks’ movement and limited access to some of their best pastures. A number of community development constraints were identified, largely linked to Arsal’s isolation: lack of access to agricultural extension knowledge and services as well as to markets for fruit products and women’s handicrafts, in addition to poor soil conditions, limited access to water and loss of biodiversity.
The research team embarked enthusiastically on the project to help solve some of these issues. As time passed, a number of actions were implemented, such as the creation of a local users network, an innovative participatory development communication platform between communities, researchers, decision makers and other development actors. The network enhanced the community’s adaptive capacity, which in turn facilitated the establishment of two cooperatives, one for herders and another for women. In parallel, the team soon came to realize the importance of village history and politics in decision making at the local and national levels, and it initiated research to better understand this component. Similarly, gender relationships were investigated, and the results contributed to strengthening actions on the ground.

At the level of natural resource management, the team developed a methodology for siting water-harvesting reservoirs, designed a participatory methodology for land stress evaluation, and established a nursery of wild fruit trees in the region, to cite only a few of its accomplishments. A major development resulting from the project was the creation in 2001 of a new multidisciplinary group at the American University of Beirut called the Environment and Sustainable Development Unit, which pools together expertise from the university and elsewhere to deliver programmes in research, education, training and outreach.

While individual participatory action research projects are always different, being influenced by specific sets of political, economic, social and cultural factors, successful projects often involve a number of common factors which contribute to their success. In a case study to evaluate the project’s policy influence, seven reasons were listed for the success of the project:

- The project was started at a time when Arsaalis wanted help and, given the conflicts they were facing, were willing to consider changes to traditional practices. To a surprising extent, the Arsaal project was demand driven.
- Every member of the team believed in the work the team was doing and was very clear with the community about the role of research in development.
- The implementing institution (American University of Beirut) has a certain standing throughout Lebanon that allows it to take initiative and to innovate where others would be halted.
While maintaining its focus on research, the team initiated a number of actions which demonstrated the direct linkages between research on the one hand and development activities on the other.

The project brought together a remarkable group of people who demonstrated commitment, creativity and imagination.

The project did not arrive and disappear. In contrast to most field research in Lebanon, the researchers kept going back, interacted with the community and, to some degree, became a part of the community.

Finally, the project was able to accommodate change.

The International Development Research Centre’s mission of “empowerment through knowledge”, that is, to help optimize the creation, adaptation and ownership of the knowledge that the people of developing countries judge to be of greatest relevance to their own prosperity, security and equity, is vividly illustrated through the Arsaal experience. In their concluding section, the authors stress that “local participation in research, while leading to valuable information, often results in little change in the livelihoods of the target community” and that “only when the elements of development were injected into our community-based research process that change in the behaviour and aspirations of the people started to emerge”. The book thus opens avenues for a wider dialogue among researchers, funding agencies and governments on comprehensive development programmes based on knowledge generation and appropriation. It also adds to our knowledge of some of the complexities of development processes.

Finally, and given the similar nature of problems facing dryland communities, the Arsaal experience related in the book bears great relevance to other research and development activities in marginal environments.

Eglal Rached
Regional Director, Middle East and North Africa
International Development Research Centre, Cairo, Egypt

Louis Navaro
Program Leader, People, Land, and Water
International Development Research Centre, Nairobi, Kenya
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Preface

They will feed beside the roads and find pasture on every barren hill. They will neither hunger nor thirst, nor will the desert heat or the sun beat upon them. He who has compassion on them will guide them and lead them beside springs of water.

Isaiah 49:9–10

Wind-swept and sun-parched in the summer, snow-capped and bitterly cold in the winter, Arsaal, like all mountainous drylands, lives between the two extremes which have forged it: the environment harsh and unforgiving which threatens life at all times, and the unstoppable will to survive of its people, its plants and its animals.

Drylands are aptly named for the lack of water, the basis of life. Besides a severe lack of natural resources, the predicament of drylands is also man-made: rapid population growth, poverty and inequality, and protracted political instability. Under these pressures, dryland communities are breaking down and disasters are expected. And these are indeed occurring: famines, severe land degradation, rural exodus and so on.

However, hidden in the highlands of Arsaal, some unlikely events are unfolding. This village for centuries subsisted on a traditional agropastoral economy based on small-scale farming and seasonal transhumance. In the past 50 years, rapid social, political and economic changes occurred and coincided with the introduction and successful production of rainfed stone fruit trees. Today, about two million trees cover its mountains, planted one by one, against all odds. This is the Arsaali paradox: at a time when the global trend is one of loss of trees and other vegetation, Arsaal, the driest part of Lebanon, is covered with orchards. Yet, every change has its price. The massive introduction of fruit trees resulted in increased fragmentation of the grazing common land, making it less accessible to other users and creating conflict between pastoralists and fruit tree growers.

The paradox was bound to attract the attention of researchers, a breed that lives on the dissection of unlikely events. Thirsty for freedom, yet boxed in disciplinary pens, we, the researchers, rammed our way out of the enclosures in search of job satisfaction. After many false starts, we
reached Arsaal on a freezing sunny day in January 1992. That was when we learned to juggle.

We had many apples to juggle with: our promotions (our livelihoods), our curiosity, our social responsibility, our thirst for adventures and our cultural roots. We juggled all these, carefully taking one bite at a time, making sure never to drop any.

The International Development Research Centre (IDRC) recognized the potential and helped us through the first, difficult steps. Research money is always a convincing argument to institutions in the drylands. IDRC effectively bailed us out of the disciplinary jail.

That was how we found ourselves rambling in the midst of new concepts and practices: multidisciplinarity, participatory research, community-based natural resource management and others. And when our apprenticeship was completed, we created our own customized tools. Our repertoire included participatory geographic information systems, blending community participation with state-of-the-art satellite imagery; different forms of institutional bricolage, such as a local users network, cooperatives and communication platforms; and new paradigms for development research, such as sustainable livelihood approach and embedded research.

Arsaal became a real-life laboratory to test innovative approaches, assessing them in terms of successes and failures, and to draw on the lessons learned. Arsaal taught us a lot. A striking first lesson is that poor and isolated communities in drylands in the Middle East and North Africa region take development research seriously and eagerly respond to its outcomes. Another lesson is that participatory research can empower the local community through knowledge, but that in order to generate a sustainable impact this knowledge needs to be intimately linked to other development activities taking place around it. We also realize that, contrary to what the development establishment purports, the sustainability of rural livelihood in drylands is not necessarily in line with the sustainability of the ecological systems that support this livelihood. In fact, these communities are bound to invest in multiple options – some of which are not necessarily sustainable – in order to cope with the various uncertainties they are forced to face. The magnitude and the impact of these complexities are driven by global (or, better, globalized) forces that are beyond the control of the local communities and dictate their survival decisions.

None of this would have been possible without the ever-present Arsaali community. Along the journey, we met many people, all of them concerned, albeit in different ways, with our development research projects: suspicious
traditional clan leaders, falsely accommodating local authorities, visionary farmers, antediluvian pastoralists, revolutionary social activists, demoralized intellectuals, and empowered yet not so independent women. They were really the people who taught us the meaning of the word participation. And not always kindly.

But who’s that El Harid character?

If the spirit of the drylands were condensed into a living object, it would be the cactus. El Harid, the cactus, is the drylands personified. His thick, spiky skin has endured the blistering sun and the bitter cold. His ears have heard the whistling wind, the bleating of sheep and goats, the cries of herders and, more recently, the rumbling of lorries. He belongs to none of them; he belongs only to the land, and it is to it he will one day return. But not before justice is done. His predicament echoes the true situation of the drylands. He is there but no one can see him; he has potential but no one is interested. If the drylands had a voice, what would it say? He has silently witnessed the modern-day scenes unfolding around him, and finally he cannot stay quiet. He dreams of worst-case scenarios but is intent on change.

This book is the tale of our journey in his eyes – a quest for an answer and a plea for hope.

Our thanks go to many people, hopefully none will be missed out. They include the researchers and research staff who contributed to both phases of the Arsaal project: Mounir Abi Said, Efat Abou-Fakhr-Hammad, Ahmad Baalbaki, Riad Baalbaki, Ghada Bistanji, Amal Bohsali, Ragy Darwish, Corinne Dick, Faraj El Awar, Rana El Hindi, Lara Geadah, Amal Hayek, Nahla Hwalla, Wael Jabre, Mazen Makki, Martha Mundy, Farah Naja, Michelle Obeid, Amal Saliby, Christine Sayegh, Helga Seeden, Richard Smith, Salma Talhouk and Farshad Tami. There are also our partners in research and development: the Lebanese Agricultural Research Institute, in particular Salah Hajj Hassan; the Lebanese Ministry of Agriculture, in particular Fouad Fleifel, Edmond Choueiri and Ali Raad; the German Agency for Technical Cooperation (GTZ), in particular Berthold Hansmann; the Green Line Association and all our friends there; UNDP-Lebanon; ICARDA, in particular Adel Nassar, Liz Bailey and Richard Tutwiller; and Oxfam Lebanon, in particular Omar Traboulsi.

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Special thanks go to Mairi Nasr and Wassim Kays for bringing El Harid to life. Finally, our deepest gratitude goes to the community of Arsaal for all the magical moments we have shared and continue to share.
### Acronyms and Abbreviations

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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ARDA</td>
<td>Association for Rural Development in Arsaal</td>
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<td>AUB</td>
<td>American University of Beirut</td>
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<tr>
<td>ESDU</td>
<td>Environment and Sustainable Development Unit</td>
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<td>FAFS</td>
<td>Faculty of Agricultural and Food Sciences</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>GDI</td>
<td>Global Drylands Imperative</td>
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<td>GEF</td>
<td>Global Environment Facility</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>GTZ</td>
<td>German Agency for Technical Cooperation</td>
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<tr>
<td>ICARDA</td>
<td>International Center for Agricultural Research in the Dry Areas</td>
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<td>IDRC</td>
<td>International Development Research Centre</td>
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<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
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<td>LARI</td>
<td>Lebanese Agricultural Research Institute</td>
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<tr>
<td>LUN</td>
<td>Local Users Network</td>
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<tr>
<td>MENA</td>
<td>Middle East and North Africa</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>PGIS</td>
<td>Participatory Geographic Information System</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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The Land

Came a year of famine.
No wheat in the village, no flour in the houses.
The land is burning hot and no seed for sowing.
Let us move to another land and then another . . .
God forgive us herders and peasants, orphans of the land.
We are never content.

Old Arsaali chant

The “Cherry Man” died on a freezing winter night in the month of January. It was he who introduced cherry production to Arsaal in the 1950s, thus changing the Arsaal landscape and shaping the events to come. I, El Harid, still remember his words echoing in the vast Arsaali highlands: the land belongs to the one who cultivates it.

But first let me introduce Arsaal.

Arsaal

Arsaal is a vast highland village in northeastern Bekaa stretching over 47,500 hectares or 4.8% of the total area of Lebanon and has an annual rainfall of 300 millimetres. Like many villages located on the marginal slopes of the semi-arid Anti-Lebanon Mountains, it subsisted on a traditional agropastoral economy based on small-scale farming and seasonal transhumance until the first half of the 20th century. Historically, Arsaal is known to have been a resting ground for transhumant Bedouins. It is located on two famous ancient mountain passages, well known since the third millennium BC: the “highway” to Damascus via the Bronze Age capital of the Southern Bekaa, Kamid al Loz, and the passage north through Arsaal. Now, sadly, they are passageways serving a different kind of traffic, involving smugglers or fugitives. The village was first recorded 350 years ago; its cemetery contains grave stones bearing century-old symbols, akin to 3,000-year-old stelae. And I have watched its transformation, from tents to stone houses, from a society of animal herders to one of farmers of marginal land.
Pastoralists at work

At my first meeting with a group of Arsaali elders, I could hardly get a word in as they eagerly competed to divulge information. Abu Hilal Izzidin, 102 years old, proudly announced that until the 1950s the villagers had owned more than 90,000 sheep and goats and cultivated 5,000 hectares of cereal and pulses for local consumption and for winterfeeding livestock. The elders even boasted that Arsaal was able to sustain an even larger number of grazing animals. The carrying capacity of the region could sustain at least 100,000 small ruminant animals, especially goats, which depended entirely on local forests for grazing and sustenance, until sheep were brought in from Turkey during World War I. The animals grazed throughout the remaining forest stands and groves in the region, in addition to forests in Syria facing the Hassa Mountain.

An elder member of the community remembered, “There was a time when trees were abundant throughout the highland areas and the plains surrounding the village, mainly wild pear, wild almond and juniper.” Pear trees were widespread in the plain and valley, living for centuries and
reaching impressive sizes, while juniper trees were distributed mainly in the highlands. Tree cover was extensive until Turkish rule. “These forests were home to 150 flock owners, who reared 90,000 animals,” added Abu Hilal Izzidin. “During their pastoral journeys, these shepherds cultivated some of the lands which they had secured, together with the grazing lands of Al Suweidan landlords, the Aghas in the province of Homs.”

The Aghas owned 13 villages before the land reform that took place in Syria in 1959. They provided water for the shepherds, in addition to land for grazing their animals and some arable land for cultivation. Also, they offered protection against raids by thieves, in return for some animals.

At the beginning of the 20th century, during World War I, Turkish authorities ordered the people to clear dense forests in order to secure firewood and fuel and to construct a railway. During this period, logging for coal became a common practice. Railways, however, were not the only reason for the disappearance of forest cover. Pear trees were subjected to other pressures. Izzidin recalled, “We often attempted to graft wild pears with cultivated pear and apple varieties, but the young saplings died.”

Today, only a few wild tree species are scattered sparsely throughout the bare landscape. Felling and grazing opened up vast arable land for exploitation in the humid highlands.

The arid northern land of Arsaal, estimated at 5,000 hectares with a precipitation rate of less than 100 millimetres, was used for grazing during the wet years. During years of above average snowfall, and prior to the introduction of motorized water tanks, some shepherds stored snow under a thick cover of vegetation as a source of water for their ruminant flock during the dry seasons. Later, shepherds depended on communal wells for water sufficiency. Some of the land in these northern areas was cultivated with barley, which was not harvested during years of below average rainfall but, instead, served as a supplement for grazing animals.

To find out more about the agropastoral system, I consulted Ahmad Baalbaki, a rural sociologist better known as the Mukhtar (village head) because of his natural ability to blend with the locals, who told me, “The system was typically based on a sheep-to-goat ratio of one to three, explaining the increasing dependence on forest land for pasture, which lasted until the mid-1950s.” However, this system did not stop the Izzidin family, for example, from raising flocks of ruminants with more sheep than goats to obtain – for the benefit of the family – milk for consumption and wool for carpet weaving. The Izzidins’ inclination towards the rearing
of sheep was brought with them from their native area of Mouheen in Hama, where the sheep was regarded as a more valuable asset.

The agropastoral production system, which prevailed in the community for several hundred years, relied on sound management practices, given the limited agricultural resource base and the harsh climatic conditions in the region. Pastoral activities were promoted at the expense of agriculture, and flock size was the determining factor for land use. The natural resources in Arsaal were managed according to traditional rights and agreements that responded to the mutual interests of the various users and reflected the integrated nature of subsistence agropastoral societies. The system was only moderately dependent on the market economy; rather, it operated in such a way that secured and perpetuated itself in its traditional form. A traditional partnership was observed in Arsaal until the beginning of the 1960s, whereby two animals were offered by a large holder in exchange for one animal and flock rearing from a small herder. After a period of seven years, the assets were divided equally. The large holder also received three kilograms of gee for each newborn female animal. Alternatively, the division of assets may be concluded on the basis of two-thirds to the big partner and one-third for the small partner, if the transaction took place within three years of the partnership. For longer periods, the division was 50/50. When the prospects for the partnership declined, the 50/50 division was applicable during any year of the partnership. Another basis for partnership consisted of the owner investing his flock and the shepherd offering his labour. Equal division took place after seven years. However, as pastoral work and labour became scarcer, this transaction period was reduced to five years.

Inheritances from cultural and production practices enhanced social cohesion and welfare, which were further strengthened by the exchange of gifts (such as newborn lambs and sheep). Some of the features of the agropastoral system, which prevailed till the middle of the 20th century, were modified by skills, traditions, and the customs which characterized the local culture and governed social relations. The extent of cooperation in production and work was concretized in a cooperative agreement: any poor man or shepherd could seek from flock owners a number of newborn sheep to start raising his own flock or expand the existing one. This enabled poor herders to obtain resources and enlarge their ruminant flock as the seasons went by.

However, these cultural inheritances which governed the pastoral way of life were disturbed by external factors related to the expansion of the
markets in the world. One such external pressure was the increasing demand for white wool, predominantly by the British, who had lost vital trade routes during the Korean War in the early 1950s. The demand for wool was locally translated into preference for sheep rearing rather than for goats. This coincided with the decline of forests and the increasing control of the government as well as the municipality over land use. Both advocated the protection of the remaining forests (especially wild pears and junipers).

The trend towards sheep rearing also took place at the same time as the breakdown of goat rearing in forests in Syria, following the agricultural reform and the division of villages among big landlords. The replacement of goats with sheep was based on a comparison between the perceived risks and benefits and the bioeconomic qualities of both goats and sheep under the circumstances at the time.

Until the early 20th century, Arsaal’s inhospitable landscape led to the emergence of big flock owners at the expense of big landowners. The vast common lands were collectively managed for the purpose of animal grazing. With the exception of wild pears, which still remained in sporadic stands and were harvested and sold by villagers, watchmen guarded other communal grazing lands along with agricultural lands. Watchmen were assigned by mukhtars, or village heads, and paid by farmers and shepherds.
“Such arrangements did not occur in other places. For example, in the more humid areas of the Bekaa, developments pertaining to traditional systems of exploiting communal lands and pastures had led to the transformation of the land there,” reported Baalbaki the sociologist. He recounted that it was administered by the villagers, who used the communal land as they saw fit. Eventually, these communal properties became a tradable commodity which could be rented or mortgaged in accordance with regulations set by the local authorities, the municipality and village committees.

“However, in Arsaal an interesting development occurred,” Baalbaki remembered, “There, owners of ruminant flocks resisted the idea of tenancy because it implied restrictions on free exploitation. They preferred joint management and exploitation of communal lands, which eventually led to their overuse. Their persistence culminated in the mobilization of a large political movement which fought against the decision of the newly elected municipality in 1965 to partition the common lands into two sections, each to be open in turn to grazing for five consecutive years. The opponents argued that large ruminant flocks could not be confined to half of the land. Their political opposition led to the dissolution of the municipality that year.”

The decline

A number of rapid social, political and economic changes, which caused dramatic impacts on Arsaal, have occurred in the past 50 years, such as population growth, rural–urban migration and the development of a market-oriented economy. These changes coincided with the generation of cadastral maps by the government in 1945 followed by the introduction and successful production of rainfed stone fruit trees. These factors led farmers to exploit communal land for stone fruit production and, at a later stage, quarrying.

The introduction of stone fruit trees to Arsaal dates back to 1952 when the Cherry Man brought cherry seedlings to the village. He met initial resistance from the villagers. Today, some 50 years later, there are an estimated two million trees in Arsaal, of which 50% are productive and are a major source of income to 60% of the villagers.

Rural migration from Arsaal waited until the late 1960s, a lag of about ten years compared to surrounding villages in the Northern Bekaa. The resilience of pastoral practices was an important factor that delayed rural migration, providing Arsaalis with little incentive to emigrate to places outside Lebanon, such as to the Gulf states, which then attracted many Lebanese.
With the breakdown of the local authorities in the mid-1970s, many shepherds began to show an inclination towards planting fruit trees as the Arsaali pastures became less available and the outputs derived from ruminant flocks could not meet the growing needs of a market-oriented economy. The trend was accentuated with the reverse migration of Arsaali to the village fleeing the raging war in Beirut and the enrolment of many young pastoralists in militias and political parties.

The 1980s brought a collapse of the national currency and a surge of smuggling activities across the Lebanese–Syrian border. Many middle and large owners of ruminant flocks began to sell their flocks, or part of them, in order to purchase small trucks which were suited for crossing inhospitable lands and dirt roads for the purpose of smuggling. The growth of smuggling activities, the massive planting of stone fruit trees, the selling of flocks and, eventually, the operation of quarries (including extraction, drilling and carving) contributed to an irreversible decline of the agropastoral life in Arsaal.

The final blow came in the early 1990s, when hundreds of young Arsaalis joined the reinstated national army and other security forces
following the demise of militias and the control of smuggling along the Syrian border.

**Flashback to agriculture**

Prior to the series of transformations and structural changes, the total cultivated land represented 40% of the total 25,000 hectares of arable land in Arsal. Until the end of the 19th century, no large land ownership patterns existed, unlike in the humid regions of the Bekaa. The land in Arsal did not attract urban traders and real estate administrators. Agriculture was restricted to the production of cereal and pulses, such as wheat, barley and chickpeas, and local varieties of vine. Hay and some barley were stored to feed donkeys, mules and sometimes horses, which either accompanied flocks during their local and distant movements or were used to plough vineyards. The use of draft animals declined after the 1950s, when tanks were introduced to carry water to the flocks.

The dispensability of draft animals, in turn, led to the decline in grain production. To Arsal shepherds, grain never constituted an important source of feed to their flocks, even during the winter season, no matter how harsh it was. This gradual neglect left these relatively dry lands fallow, which were subsequently used as grazing land for the increasing number of sheep after the 1950s. Earlier grain production employed two threshers up until 1985. With the decline in grain output, Arsalis relied on one thresher only, which was rented from outside the village for short periods of time, whenever needed.

Along with the decline in the cultivation of grain, which frequently gave way to shepherding and stone fruit production, the importance of vineyards (which constituted 5% of the community's surroundings) also decreased. Most vineyards were neglected because of expanding construction and because of the relatively low yield of grapes compared to cherries and apricots.

**The landscape today**

The Arsal landscape today is wild and barren. It is desiccated and treeless except for some wild pears and almonds and a few lonely junipers scattered here and there.

A mukhtar admitted that the 4,000 Arsal households felt isolated, largely because of hardship caused by the lack of resources and the fact
that they were Sunni Muslims surrounded on the Lebanese side by Shiites. These factors, as well as being marginal politically with weak ties to the central government in the capital, Beirut, contribute to the isolation of a community of nearly 35,000 residents. The labour force in the village is still in its majority unskilled and 75% of Arsaalis work in agriculture.

Arsaalis recognize six ecozones, three of them along altitudinal lines in the highlands. The remote and inaccessible high Jurd (elevation 1,950–2,400 metres) reaching to the summit that forms the Lebanese–Syrian border was the traditional chickpea planting area owing to moisture provided by snowmelts that replenished the soil reserves. The middle Jurd (1,550–1,950 metres) has mild slopes and large areas of land which were the traditional grazing lands of Arsaal but which have become prime lands for orchard development and later on for quarrying activities. The lower Jurd (1,300–1,500 metres) with a steep rocky landscape and a severely eroded soil has little agricultural potential. At the base of the Jurd lie the valleys (wadis), considered by the locals as an independent ecozone in view of their relative lushness. Whenever feasible, the wadis have been reclaimed and farmed with figs and grapes and have witnessed a rapid spread in urban dwellings. Then comes the dry and scorched vast eastern plain (Sharqi zone), which is the entrance to the Syrian Badia. Previously a main barley planting area, cropping is now at a near standstill having been replaced by open access overgrazing by large wintering herds. The eastern plain and the wadis are characterized by wide ravines carved over the years by flood routes and by the presence of scattered shallow unlined rainwater catchment wells, locally called the roman wells. A sixth ecozone acknowledged by Arsaalis is the western area (Gharbi), extending westwards towards the Bekaa valley, which has been planted with cereal, pulses, grapes, fruit trees and recently olives as well as serving as the wintering site for small village flocks.

The struggle for survival has produced rapid changes recently in the lives of the villagers. The private land of the village, about one-third of the total area and once owned by 500 households, has been increasingly fragmented among the expanding population of inheritors. About 70% of this land is owned by 30% of the population, while 44% of households have small portions of less than five hectares amounting to about 10% of the land. Only 5% of the households are landless.

The massive introduction of fruit trees on Arsaali communal land was facilitated by the breakdown of state and local authorities and was undertaken in anticipation of a government survey to reassess the public
and private delineation of land in Arsaal. The planting of stone fruit trees, together with cultivation practices such as tillage, has not been accompanied by proper soil conservation measures such as stone-walled terraces as applied elsewhere in the Lebanese mountains. Harvest and erosion without fertility enhancement or soil conservation measures are therefore continuously depleting the land.

A group of Arsaali schoolteachers provided further insights. “The overall picture in Arsaal reflects a swift transition from a traditional agropastoral system to rainfed fruit production and off-farm activities,” one teacher said. “The people don’t know how to look after their land properly; they were shepherds before. The soil is becoming weak, and now there is less common land for the remaining shepherds to use.” What about the 60,000 sheep and goats owned by about 170 households? “Because of all these changes in land use, they have been forced to move outside the village, sometimes travelling long distances. I suppose this new trend is understandable since livestock requires full-time tendance, while tree cultivation is far less demanding yet far more rewarding.” One hectare of cherries requires 74 workdays per year, mainly in the spring and summer with the major labour requirement during harvest, carried out collectively by the whole family. Thus, agricultural practices remain predominantly family based.
“As a matter of fact, the practice is that families plant cherries and apricots in quantities and areas that their family can manage,” began a second teacher. “A few farmers might occasionally hire paid labour during the short periods of planting and harvest. Because of this traditional set-up based on direct involvement and low-input practices, which confine the work in cherry and apricot orchards to the household level, no other modes of agricultural management have evolved. In Arsaal, the size of the orchards is dictated by the labour force of the village.”

Moreover, agricultural activities in Arsaal rarely attract foreign workers, particularly Syrian workers. This is mainly because working in an orchard for a relatively short period of the year provides little work incentive to Syrian families, who prefer to camp for several months, and sometimes for a whole year, in areas which benefit from more extensive agricultural activities, such as in the wetter valleys. There, women and children, too, work in the field, in agricultural projects run by agribusinesses, which exploit cheap labour and transport families in small trucks or pick-ups from one farm to another.
In light of the small production scale and the seasonal nature of fruit production, farmers are left with ample time for other activities, including the generation of off-farm income. In fact, more and more farmers are relying on non-farming jobs as the main source of income and consider farming income as supplementary. “Our children (the boys) are more educated than our generation, and they are reluctant to work with the animals,” reflected the schoolteachers.

Furthermore, education, even at the elementary level, has enabled Arsaalis to diversify their livelihoods. Around 600 of them are currently government employees, including teachers and members of the army and other security forces. Another 250 households are involved in small businesses and commerce.

The last two decades have also witnessed expansion of the unregulated quarrying sector onto the village common land, further complicating the socioeconomic landscape. One of the mukhtars elaborated, “This has been facilitated by the absence of regulation and sometimes the complicity of local authorities. There are 60 small-scale quarries and 100 stone cutting factories providing income for 100 families.” It is noteworthy to mention that the government has recently developed a regulatory master plan for the quarrying sector in Lebanon. The plan proposes to limit quarrying activities to the semi-arid areas of the Anti-Lebanon Mountains, including Arsaal as a major site. If implemented, it will have drastic impacts on the sustainability of agriculture in the village.

Despite all these changes and transitions, Arsaal still boasts a ruminant stock comprising around 42,000 sheep and 19,000 goats, equivalent to about half of the stock during the 1950s. The owners of some of the large ruminant flocks, and those who have returned to rearing and shepherding, still believe that pastoralism is the safest activity worthy of capital and human investment in an insecure open market.

“Today, there is a general move towards a wage-based pastoral practice, especially when the flock is small. In this way, the flock owner can work in other jobs,” another mukhtar added. “I mean, rearing a flock only requires one man, and domestic feed is now freely available in the winter. They can get hay from farms in the Bekaa and grain from the market. This practice, involving paid labour, is becoming common in villages in the Bekaa and is causing traditional types of partnership to disappear.”

The mukhtars agreed that expropriation of common lands for fruit cultivation and quarrying operations has led to frequent conflicts over land use among pastoralists, fruit growers and rock extractors amidst the
breakdown of traditional land management arrangements. The once delicate and consensual formula has given way to a critical status quo based on a de facto conflict management system, modulated by kinship affiliations and aggravated by the lack of any government policy on the exploitation of communal lands. This is not what the Cherry Man had in mind when he planted his seedlings and was shunned by the villagers and even his closest relatives. He had dreamt of a better future for himself and his fellow Arsaalis, a future which would transcend the misery and hardship of agropastoral life.

The Cherry Man’s proud and imposing face softens as he comes to the final sentence, and climax, of his story – a tale about a king and a shepherd arguing over who is richer. The shepherd wins owing to his height, which he claims will guarantee him a bigger coffin when they are both dead and gone. The Cherry Man’s twinkling eyes give away his amusement at this startling truth, and one begins to glimpse into the depths of a man whose simple story encapsulates his philosophy: you are rich in who you are. As I prepare to leave, he carefully selects and presents me with a sprig of basil, and one becomes aware that he is the rare species among the abundant variety of green plants crowding his garden patio.

He died on a freezing night leaving Arsaal behind in a state of dissent; after all the land belongs to whoever exploits it! The Arsaalis did just that in a desperate effort to sustain their livelihoods amidst an increasingly hostile environment and little available resources. Just prior to his death, this gifted visionary was still at work! The Cherry Man’s last thoughts rested on the prediction that urban dwellers would come to Arsaal for a breath of fresh air, sadly lacking in their increasingly chocked-up environment.

Where are the women?

I heard from the villagers that a “special” lady is living in the village with them. She is Michelle Obeid, a graduate student studying traditional lifestyles. I met with her in the little room that she has made her home. Michelle had a lot to say about gender issues.

“Arsaal’s traditional system of agropastoral production has produced a particular gender ideology based on cooperation (ta’awun) and sharing (ishtirak), enhanced by the nature of the herding unit, which usually involves large households and requires the participation of all members. Men accompany the flock to pasture, shear sheep and take care of marketing the milk. Women take care of the household doing cooking and cleaning,
milk goats and sheep, and clean their pens. Clearly, the roles are elastic enough for the boundaries to be crossed by both men and women.”

“Were you able to talk to any of the men about these boundaries?”

“Yes, of course. In fact, one Arsaali herder, Abu Hassan, was very clear on the matter. According to him, this world is about cooperation. When there are two or three females in the house, they take care of their own matters. But when there is one female on her own, the male has to help her; he is obliged to. He has to milk with her, make cheese and ghee with her, while she will help with marketing.”

And this is true; one only needs to pay the herders a visit in the months of harvest (June–August) to find the entire household – men, women and children, even relatives and neighbours – working collectively on a plot of land.

It is important to note that, with agropastoralism being the primary mode of production, women’s domestic role extends to extra-domestic activities, especially harvesting and other agricultural as well as pastoral activities. But with the ambivalent shifts in traditional modes of production – fruit growing, employment and new industries (namely, quarrying-related
activities) – gender roles and relations started moulding along new cultural expectations, different from those of the earlier agropastoral model.

The shifts to seasonal and less time-consuming modes of production along with the encroachment of technology have had a multitude of repercussions on the household and more so on women. On the one hand, women find themselves confined to more monotonous, domestic activities. On the other, the changes are imposing increasing pressures on the household to increase production and cash income.

Unfortunately, Arsaal’s sluggish economy and the lack of governmental attention have created a limited space for women in the labour force in the form of seasonal agricultural activities and domestic food processing. Women work partly because of a household’s need to share but more importantly because work brings with it important values and an important balance in gender power relations.

And, as if to prove her point, Michelle shared with me a very moving statement from one Arsaali woman: “When I stayed without work, I felt that I was buried alive. I would wipe the floors and clean here and there. I felt that it would have been better if I were not born! The more I worked, the more I became confident of my kayan [being]. While working, I meet people and, through this, I learn from my social relations. Social relations make you explore all sides [of yourself]. But when I sit at home doing nothing and seeing no one, my mind becomes stagnant” (Sana, secretary of a non-governmental organization).

The Dryland Predicament

The first president and cofounder of a local association that was established in the 1980s to promote rural development in Arsaal (the Association for Rural Development in Arsaal, or ARDA) was known as the Karl Marx of Arsaal because of his eloquent and prolific sociopolitical analyses and use of unmistakable terminology adapted to fit the Arsaali realities. He was often heard saying, “Arsaal has been kept outside of history and geography!” and this was his opening sentence at our first meeting.

He was only repeating a version of a familiar tune that has been resonating for decades in all the drylands of the globe: the old song of marginal life. Drylands are aptly named, for they lack water, the basis of life. This in itself is enough to limit the ability of people to build livelihoods that satisfy their basic needs and aspirations. According to the Food and Agriculture Organization (FAO 2001), drylands cover 89% of the land area
of the Middle East and North Africa (MENA). More than 100 million people live in these areas and are at risk from the effects of the loss of productivity on their livelihoods.

It is not only the lack of water that makes drylands a difficult environment; it is also the distribution of water. Rainfall, which can reach up to 700 millimetres per year in the subhumid zones, is erratic. Inter-annual rainfall can vary from 20% to 100%, and periodic droughts are common. Arsaal, for instance, receives an average rainfall depth of 300 millimetres per year. The low rainfall depth is coupled with a temporal and spatial non-uniform distribution, further exacerbating the water shortage problem. Furthermore, water management for irrigation is practically non-existent in the village.

“Besides the severe limitations in natural resources, the dry lands in the MENA region also bear the brunt of man made predicaments: the disabling economic, political, social, and cultural structures that shape the world today” (Rodenbeck 2000). The region continues to endure protracted political instability as well as social alienation and is lagging behind its potential by most development indicators. Rapid population expansion is placing tremendous stress on scarce and fragile natural resources. Inequality and poverty limit the opportunity for fair, balanced development. Public policies, markets and politics are often associated with the chronic lack of transparency and democracy, along with the dominance of either state-controlled or laissez-faire economic systems (UNDP 2002). The natural and man-made predicaments are huge driving forces. Under these pressures, significant changes have swept through dryland communities in the MENA region faster than the people could adapt. This has led to the breakdown of traditional livelihood systems, which have not been replaced with a viable alternative. As a result, the livelihood of millions of rural people living in drylands is presently in serious danger. Dryland communities worldwide are in a major crisis and are breaking apart under the strain of global development forces. The declining local economy along with environmental and social degradation is eroding local identity and community cohesiveness (UNDP 2001).

“Allah [God] does not care for us,” said the “Sergeant” to me on one of the frequent hikes he used to have in the blazing sun of the highlands. He would sarcastically add, “Things will improve in a couple of hundred or thousand years.” Obviously, God was not the one to be blamed by an old-time atheist like the Sergeant, a nickname he acquired in the 1980s because of the army uniform he used to wear while undertaking smuggling activities
across the border. That period witnessed an explosion of smuggling activities attracting hundreds of otherwise jobless young men who migrated back from Beirut to Arsaal following the Israeli invasion of Lebanon and its aftermath. “We had very few options,” explained the Sergeant while trudging through the tortuous trails of the high Jurd, a region he knew like the back of his rough hand. “Savings from these smuggling activities were later invested in quarries and related industries after the decline of smuggling in the early nineties.”

Poverty or “having very few options” is a crushing weight for most of the rural poor in drylands as they search in vain for opportunities that continually elude them. They face severely limited opportunities and are forced either to overexploit the natural resource base or to migrate to already overcrowded urban centres (Bishay 1998). Nevertheless, the poor in dry MENA truly believe in local development as shown by the Sergeant, who became one of the active founders of ARDA. The establishment of ARDA came as a response to a complete absence of governmental development programmes usually associated with towns or villages in the more productive Bekaa valley that are situated closer to major road links and are therefore more accessible.

De-developing the drylands?

Faced with problems as monumental as these, my quest was to find a solution. What is being done and how to find out? What better way to find out than to attend a workshop on Research for Development in the Middle East and North Africa? I felt that I would have some significant encounters. Sure enough, the workshop was very interesting. I found out that a multitude of development agencies and non-governmental organizations (NGOs) have been channelling aid funds aimed at improving the lot of the rural poor in drylands. For the most part, their approach has largely been piecemeal and has lacked context and broad visioning. Most agencies, under the banner of sustainable development, have predominantly addressed issues relating to the natural predicament. The current approach can be summarized in the following question: What technologies can we import to overcome the constraints imposed by the natural environment? I could see that, often, the result is development in which only some aspects of the problem of rural communities are addressed at a time. Moreover, I felt that there is also a significant donor bias towards what is perceived as a problem through Western eyes. It was obvious that these perceived problems include
governance, social and gender, as well as environmental conservation issues, often addressed in a manner that is inappropriate.

Arabesque

Development in the Arab world has a bitter taste of Bedouin coffee. I was struck by this comment. Eglal Rached, regional director of the International Development Research Centre (IDRC) for MENA, explained, “Traditional approaches to development in the Arab region, including policies and research, have often ignored the role of local people in designing and implementing the required solutions. Public participation in decision making in the specific context of environment and development is rare and lacks the proper institutional framework. Also, reports from FAO tell us that agricultural research has rarely been focused on applied problems of communities in risk-prone areas and market research for small producers has been minimal. Moreover, extension systems have often been top-down in design and delivery, leaving little scope for farmer-driven initiatives and partnerships. Institutions of higher education have failed to join in comprehensive partnerships with communities” (Rached 2002). I was disappointed to hear Ms Rached say that the concept of participatory research is still not widely appreciated or applied. Policy is rarely based on a good scientific understanding. Most importantly, transdisciplinary research and development institutions with coherent research strategies and holistic conceptual frameworks are lacking.

Another important person I met was the president of IDRC, Maureen O’Neil, who was able to give me some insights into the predicament facing the vast majority of the population in the Arab region. According to Ms O’Neil, the region suffers from acute development problems. Growth in gross domestic product and integration in the world economy have not been paralleled by social and human development. Environmental degradation and accrued depletion of water and arable land are working against economic growth, food and water security, and qualitative human and social development. The absence of representative, accountable and democratic governments, in addition to bureaucratic bottlenecks, threatens already bleak development prospects (O’Neil 2000).

My heart sank on hearing such negative comments, but worse was to come. Ms O’Neil revealed further that the research environment is weak and plagued with the lack of institutionalized or well-defined public, national and regional research strategies, problems associated with the
dispersion of research activities, inadequate national funding, weak research management, weak scientific and research capacity, and restrictions in terms of independent inquiry and data access and collection.

Feeling distinctly gloomy, I headed for the American University of Beirut (AUB) hoping for something positive. Could Dr Nuhad Daghir, dean of the Faculty of Agricultural and Food Sciences, enlighten me further? I was desperately disappointed to realize that institutions of higher education had failed to introduce the concept of sustainable agriculture or join in comprehensive partnerships with the rural communities.

“In most colleges and universities in the Middle East, agricultural programmes are still traditional, and little emphasis is placed on the concept of sustainability, especially in production agriculture programmes. Furthermore, these programmes are poorly integrated and often too specialized for undergraduate instruction. There is a need to expand on the concept of diversification in crops and animals and to focus on subjects related to agriculture as a form of sustainable resource management, such as integrated pest management, crop rotation, judicious use of fertilizers, and other practices that foster sustainability.”

“In that case, what kind of courses do your students take?” I interjected.

“So far, we have been teaching conventional agriculture production courses with the objective of maximizing yield and quality of product with minimal attention given to environmental and social impacts. This approach has to be changed, and we need to instil in students a consciousness about reducing the use of non-renewable resources and replacing them with renewable resources whenever possible. Our students must become aware of their role as stewards of the environment and of rural life. Therefore, our philosophy and approach must become increasingly centred on attaining sustainable rural livelihoods. This requires us, the agricultural universities and colleges, to make a major paradigm shift from the unidimensionality of production farming to the multidimensionality of rural livelihoods. This can only be possible if we fully adopt sustainable agriculture as our credo.”

What is new?

So, is there anything new? I felt uplifted, at last, to discover that current development donor organizations do recognize the dryland predicament. The Global Drylands Imperative (GDI) is a recent collaboration of organizations involved in dryland development. This partnership includes the Canadian International Development Agency, the United Nations
Development Programme’s (UNDP) Drylands Development Centre, UNDP–Global Environment Facility (GEF), the International Institute for Environment and Development, the World Wildlife Fund, the World Conservation Union and the Near East Foundation. It is a growing partnership that is dedicated to addressing dryland issues and increasing the awareness of their importance.

Elie Kodsi, the Drylands Development Centre’s MENA regional team leader, spoke to me about a series of challenge papers on drylands recently developed by GDI. “We call them challenge papers,” explained Elie, “because they aim at challenging ‘conventional thinking’ about drylands, that is, that they are hopeless places in need of constant welfare support. We believe that, with enlightened policy and adequate support, drylands can provide good livelihoods for their inhabitants and thus contribute to national poverty reduction efforts.”

Excited to hear this, I pressed for more. “This is good news! But what do you mean by enlightened policy?”

“We believe a major challenge facing the development community will be to put dryland development where it belongs: at the heart of development and poverty alleviation for nations that contain significant amounts of arid and semi-arid land.”

“Why hasn’t this been the case until now?”

“Well, think of the war on poverty in developing nations as an analogy of World War I. In this fanciful scenario, big irrigation projects in areas of high agricultural potential would be the equivalent of trench warfare in France, the battles that consumed vast resources – and accounted for huge losses. In the mind of the high command, on the other hand, the fight to alleviate poverty in drylands would be more like a minor skirmish in a faraway continent, a sideshow of only peripheral interest. For a variety of reasons, the issue of poverty in drylands has been treated as a marginal phenomenon, isolated from the main thrust of development. This is tragic negligence based upon a number of assumptions about the paucity of rural dryland populations and their remoteness from the pressing concerns of emerging nations. These assumptions fall apart upon close scrutiny. In fact, the tendency to isolate dryland concerns undercuts anti-poverty initiatives. In poor countries, the very poorest of the poor tend to be rural dryland people. When things go bad in the hinterland, problems quickly transmit to the more humid areas. Cities lose the benefit of dryland production, while they gain a surge of migrants, often without the skills and education to successfully integrate into urban life. And if drylands contribute in
unexpected ways to national poverty problems, they also hold the promise to be part of the solution.”

And so I left Elie’s office greatly encouraged and inspired by the “lonely heroes” of GDI who are fighting for the drylands by developing new approaches and trying to get something done.

**The Lebanese Backdrop**

I wonder whether Elie Kodsi’s new initiative could work in Lebanon. I visited experts in the Faculty of Agricultural and Food Sciences of AUB, who gave me this information on the Lebanese agricultural sector: Lebanon’s arable land is limited to one-third of its total area of 10,452 square kilometres with only 68,000 hectares as permanently irrigated land and nearly 100,000 hectares as fragile terraced mountain land. All lands experience moisture deficit during a period ranging from four months in the high rainfall zones (1,400 millimetres per year) to over ten months in the lowest rainfall zones (200 millimetres). Agriculture, once a prominent activity, now contributes less than 10% to the gross national product. Over the past 50 years, the Lebanese agricultural sector has witnessed a major shift from a low-input, extensive farming system aimed at staples and some fruit production to an intensive, land-limited and horticulture-based system. The proportion of the agricultural force in the total labour force dropped from 38% in 1960 to 7.5% in 1993 (FAO 1995). The Lebanese wars, including the Israeli invasion of 1982, further contributed to the crippling of the agricultural sector, as it caused a total breakdown of the country. The work of government offices was halted, including research efforts and extension. The lack of institutional capacity in the country prevented the development of the agricultural sector and delayed any legislation on its environmental impact. Remote rural areas remain least developed in the country with the lowest income rates: more than 15% of households and 20% of individuals earn less than US$40 per month, compared with a national rate of 4% and 6% respectively (Nehme 2001).

In spite of the comparative advantage inferred by a cooler and wetter climate than other Middle Eastern countries, the Lebanese agricultural sector is clearly collapsing. The ecologically sustainable integrated agropastoral system of the plains and the terrace-based conservation farming of the hills and mountains have nearly disappeared. In some areas, they have been replaced by an extensive, no-input mono-cropping of wheat and barley, in which the lack of organic and mineral fertilization is inducing a
decline in soil fertility. On the terraced mountain land, some fruit trees are still harvested, while other terraces are left to decay. In areas where irrigation water is available from renewable or non-renewable sources, the economically (but not environmentally) sustainable high-input agriculture has established itself as the only viable alternative.

Dryland agriculture, especially in the Bekaa valley, is severely constrained by the physical nature of the land. Throughout the centuries, local farmers have developed time-tested strategies which mitigate the impacts of droughts, seasonality of rainfall and poor soil fertility. These strategies include, for instance, the selection of drought-tolerant cultivars, the use of fallow for increasing soil moisture, the reliance on cropping systems that maintain high soil organic matter, and the incorporation of a legume in crop rotation in order to improve and sustain soil fertility.

Livestock production, especially sheep and goats, has traditionally been an integral part of dryland agriculture in Lebanon. The Bekaa valley and the surrounding mountains are home to half of Lebanon’s small ruminants (440,000 goats and 150,000 sheep) and account for 40% of Lebanese pasture land. The small ruminant systems in the dryland zones are highly interlinked with the crop production of higher-potential zones. The grazing activities of these animals used to be regulated by traditional grazing rights which took into consideration the carrying capacity of the land. There are indications that these dryland farming systems are undergoing drastic changes (Hamadeh et al. 1999). Marginal lands are being increasingly used in crop production and becoming less available for livestock production. In addition, traditional agropastoral systems are developing into more sedentary ones to adjust to severe environmental constraints. The breakdown of the system of traditional grazing rights and the low productivity of the flocks have all contributed to the overstocking of the shrinking rangelands.

It is clear, therefore, that a significant effort is required to improve agricultural sustainability in Lebanon. Rami Zurayk, a consultant to the Minister of Agriculture in Lebanon, was able to outline for me what that “significant effort” might entail. “One approach to the successful implementation of sustainable agriculture is currently advocated by the major international development organizations and donors, such as the World Bank and the United States Agency for International Development. This approach requires cooperation between five major players. These are the public sector, the industrial sector, the small-scale commercial sector, the NGO community and the farm sector. This approach was crystallized
by Harwood (1996) in a model of successful technology development used for enhancing agricultural sustainability, which represents the mainstream thinking on the matter.”

“Unfortunately,” Zurayk continued, “none of the five main players have the will or the leverage to establish such a partnership.” This is how it looks according to Zurayk:

**The governmental sector.** In post-war Lebanon, governmental efforts are geared towards the reconstruction of the infrastructure in urban areas. There is a clear lack of commitment from the government to the improvement of the traditional agricultural sector. Today, with around 1% of the country’s budget allocated for agriculture, the governmental sector cannot be depended on either for regulation or for extension and research.

There is a growing realization that, in most countries of the MENA region, governments have failed in critical core functions such as providing universal education and establishing an enabling framework for private sector investment and production (Hall and Jones 1999; Lofgren and Richards 2003). Moreover, by promulgating excessive regulations that are impossible to enforce, governments are often actively destructive while at the same time protecting privileged groups.

The role of Lebanese research and development institutions, including universities and the Lebanese Agricultural Research Institute (LARI), has been constrained by the lack of a comprehensive policy for sustainable agriculture. It is worth mentioning that an IDRC-supported study to formulate a research strategy for LARI in post-conflict Lebanon has been mostly ignored. Environmental sustainability issues have only recently become research priorities in academic institutions. AUB’s Faculty of Agricultural and Food Sciences is in the best position to play an effective role, in view of its access to funds and resources. Its role in producing agricultural professionals has been prominent in the region since its founding. In spite of its high international research output and its significant contribution to the introduction to the Middle East of the principles of the green revolution – intensive crop and animal farming – its global impact on technological development has been questioned.

**The industrial sector.** In view of the limited size of the Lebanese market, it is unlikely that the industrial sector will see any potential in producing cultivars or employing any other technology aimed at sustainable production in local Lebanese agriculture.
The small-scale commercial sector. Unregulated and operating under difficult economic conditions, the small-scale commercial sector lacks a sense of responsibility for nor a commitment to sustainable agriculture. In the absence of public extension, fertilizer and pesticide recommendations are provided to growers by salespeople from commercial companies. These salespeople’s aim is usually to maximize use in order to increase their sales and hence commissions. The pesticides sold are often inadequate or internationally banned. Where intensive irrigated agriculture is practised, fertilizer use is routinely excessive. The short-term nature of the investment and the rapid return sought by the small-scale commercial sector are understandable in the high-risk, unregulated and unsupported Lebanese environment. The negative implications on resource sustainability nullify all potential benefits that might result from this sector’s diversity and entrepreneurship.

The NGO community. New and growing, this sector is characterized by its immaturity, financial dependency on foreign sources, imported paradigms and Western influence. This is clearly demonstrated by the priorities adopted by NGOs regarding the sustainability of natural resources: while there exist currently over 100 “environmentally concerned” NGOs in Lebanon, few are effective in addressing the problems of agriculture and farmers. The situation is similar in other Middle Eastern countries, where the concept of civil society empowerment is also a recent import. Although much hope was placed in their potential role in effecting change towards sustainable agriculture (Zurayk 1994), this change has not materialized.

The apparent failure of participatory civil society organizations in Lebanon and elsewhere has been attributed to cultural – that is, independent tribal ethos (Chaudhry and Ryan 1984) – political and financial reasons (Salamon 1994) and to patronizing attitudes towards farmers and rural people (SARD 1995). Their reliance on external sources of money, usually from international NGOs channelling bilateral aid funds, means that their survival is linked to Western aid sources and their development priorities. As a result of the global economic recession and the shift in emphasis towards Eastern European countries, after the war ended in Lebanon the amount of financial support given to Lebanese and Arab NGOs has been reduced to a fraction of what it was in the 1980s (Pike 1993), leaving them distraught and generally ineffective.
The farm sector. The Middle East is believed to be the cradle of settled agriculture. It is therefore not surprising that Lebanon’s farming community is rich in indigenous management systems that have evolved over centuries to mitigate the impact of droughts, deforestation, erosive rainfall, rainfall seasonality and poor soil fertility. Research has shown that, in some remote communities, elaborate management systems are still being used for the communal management of forests, irrigation water and soil conservation (Zurayk and Al Mubayyid 1994). However, the rapid sociopolitical and economic changes that have been witnessed by the Middle East region in the past five decades, such as migration, land tenure changes, market pressure and the availability of cheap grain resulting from Western food surpluses, have led to the near demise of these systems. Although these systems have ceased to be sustainable (in the socioeconomic sense), they may, given suitable environments, form the basis of an adapted, improved system. The issue is urgent, as this knowledge is only available in the oral tradition and is rapidly disappearing.

Although this discussion addresses Lebanon only, a similar analysis probably applies to the other countries of the Middle East which share the same sociopolitical and economic characters.

“It would seem that the main shortcomings of the prevailing World Bank model is that, in the Middle East, roles and responsibilities are not equitably distributed among all five players,” I concluded.

“Yes,” agreed Zurayk, “A prerequisite for the operation of any such model is a responsive political system that is sufficiently free to allow liberal and participatory development, yet influential enough to regulate powerful players such as industry. In the current context of the Middle East, where governments are generally undemocratic and insecure, this requirement is not readily achievable. The ‘public-sector prerequisite’ view is shared by technology, economic and policy experts (Bay-Petersen 1986; Rukuni 1994; Harwood 1995), who acknowledge the difference in paradigms between developing and industrialized countries, underline the critical role of political and social pluralism in sustainable agriculture, and emphasize the structural role of the public sector in enabling all the other players in resource-poor developing countries. The role of the public sector is at a primary level, as it enables the other actors to play their roles. Without it, sustainable technologies, sustainable agriculture and sustainable development cannot be realized. Unfortunately, it is difficult to visualize such a public sector in present-day Middle East.”
Back to Arsaal

Back in Arsaal, I was astonished to stumble across a group of researchers wandering around Arsaal. After having completed my own “researching”, I was intrigued to find out what had brought them here. They were only too happy to oblige.

“Our encounter with Arsaal took place in 1992, within the context of a regional dryland resource management project conducted by ICARDA and funded by IDRC. The objectives were to assess changes in natural resource management within the MENA region, identify the causes of, and the problems resulting from, those changes and propose alternative strategies for improvement. Under the umbrella of this project, teams of national scientists from six participating countries – Jordan, Lebanon, Libya, Pakistan, Tunisia and Yemen – conducted case studies.

“Originally, the Lebanese study set out to update the development of agricultural systems in Buarij, a highland village situated on the wet eastern slope of Mount Lebanon, based on a historical recollection of the village by Anne Fuller, a young graduate student of anthropology from Harvard University who came to reside in the village in 1938 for a full year. Her description of life in the village was detailed in a book that became a classic in its category. Our findings revealed that Buarij in the 1990s was only a vestige of Fuller’s account in the 1930s. Despite ample water resources, agriculture was dying out and most of the arable land was left fallow. The village’s lush pastures were being leased to outside flocks for grazing. Some of these flocks came from Arsaal. From our discussions with the herders, we knew that they had to migrate with their herds from Arsaal because Arsaali grazing lands were being converted to fruit production and becoming less accessible to their animals. Our curiosity led us to visit Arsaal (literally, a village off the beaten path), and we came face to face with the cherry phenomenon: hidden in the highlands among one of the most desolate landscapes certainly in Lebanon stood colonies of thousands and thousands of green stone fruit trees – in a dry and marginal ecosystem barely suitable for barley. The Arsaali ‘miracle’ was beyond any description, probably one of the largest reforestation efforts – without the pretension of being one – in Lebanon and probably in the region. We immediately decided to include Arsaal in our case study to compare farming systems under different agroecological conditions. This is how the story of Arsaal was uncovered.”
The Cactus Dream

Reflecting upon his journey, El Harid sat down, confused by the intricacy and complexity of the problems prevalent in drylands. After all, El Harid is ancient. He is the remnant of an old and bygone age. Left alone and deeply troubled by the gargantuan forces which have taken control of livelihoods and are changing the land forever, he sleeps and wakes. Fleeting images and crying echoes – the sound of multitudes of sheep and goats grazing nearby and the steady plod of the shepherds’ feet – haunt his dreams. He sighs, remembering distant, kinder days.

Day after day, he thus ponders on his lost value and wonders if it is too late. Nightly, he shudders as rumbling lorries haunt his dreams. He tosses and turns, moaning, “What’s to be done?” . . . But who is this?

His plaintive cry has summoned three great reactionaries into his dream. Could this be the answer?

Before him stands Kyang Hi. “Nothing will be done before blood is shed. I’d give my life for Korea, to change what is happening to my land,” the Korean farmer declared before committing suicide at the World Trade Organization meeting in Cancun, Mexico, in September 2003.

Startled, El Harid turns round as the gruff voice of Jose Bove growls, “Tomorrow I weel go to ze McDonald’s and throw ze breeks. You must pressure ze government to change policies. Attack, I say, attack!” (Jose Bove, one of the leaders of the anti-globalization movement, was imprisoned for his act of vandalism against McDonald’s.)

Finally, a transparent-looking Tanious Shahine quavers, “Listen to me, my son. Call on all other cacti to fight, to march the streets and overthrow. It’s revolution that’s needed.” (Tanious Shahine led a Lebanese peasant insurgency in the 18th century that was brutally repressed.)

“But”, begins El Harid after a few moments of contemplation, “my basic problem is water shortage. I’m a cactus. I can wait . . . maybe it will rain.”
Here comes the rain!
II

The Seed

You see things; and you say ‘Why?’
But I dream things that never were;
and I say ‘Why not?’

Luigi Pirandello (1867–1936)
Italian writer of Six Characters in Search of an Author
and Nobel literature prize winner

“Now that I know how you got here, tell me the story of your project and its inception.”

Our story has much in common with Pirandello’s masterpiece Six Characters in Search of an Author. The premise of the play is that six characters have taken on a life of their own because their author has failed to complete their story. They invade a rehearsal of another play and insist on playing out the lives that are rightfully theirs. Suggesting that life defies all simple interpretations, Pirandello’s characters rebel against their creator. They attack the foundation of the play, refusing to follow stage directions and interfering with the structure of the play until it breaks down into a series of alternately comic and tragic fragments. The stage manager, watching this entire scene, is unable to tell if it is still acting or if it is reality. Fed up with the whole thing, he calls for the end of the rehearsal.

Throughout the Arsaal project, we felt as if we were invading a stage that was not our own and that our story had not been completed. We had started our adult life with political engagement but had never been sufficiently empowered to make a difference. We found that all the various characters of the project shared similar feelings. ARDA, the local counterpart NGO, had been founded by a group of left-wing militants who felt that the Lebanese war had not brought them what they fought for. The “funding officers” at IDRC shared much of our ideologies and our experience. Together, we invaded the development scene and attacked its foundation. We refused to follow stage directions and interfered with the structure of the play, never failing to emphasize the tragi-comic aspect of it all. All the time, we were expecting the whole thing to be called off.
The Characters of a Comedy in the Making

THE RESEARCHER
THE UNIVERSITY
THE FUNDING AGENCY
THE FUNDING OFFICER
THE LOCAL COMMUNITY (does not speak)
THE LOCAL NGO

The Researcher

The Researcher was born in the second half of the 20th century. His hair is greying, and he has been through the Lebanese war as an adolescent and a young adult, an experience which has emotionally scarred him. He is concerned by world poverty and by injustice. He likes to see his work as an essential component of the global struggle towards equity. He has toyed with various socialist doctrines and has now settled with Existentialism as a literary emblem for his mid-life crisis. He was born angst-ridden.

The Researcher has been to the best schools in Lebanon and is perfectly fluent in at least three languages: Arabic, English and French. He has a doctorate from the West. He teaches at the American University of Beirut (AUB), in the Faculty of Agricultural and Food Sciences. He is frustrated because he feels that the University does not address real-life issues, with academics living in ivory towers, divorced from reality. He desperately wants to make a difference.

The University

The University is where the Researcher lives, eats and breeds. A venerable establishment, it has as its creed “That they may have life and have it more abundantly”. Over the past 160 years of its existence, it has taught students from all over the world, many of whom have progressed to key positions in their countries or on the international scene. The University has been severely punished by the Lebanese war. Over 17 years, the quality of its teaching slowly declined, and many faculty members left. It became a national university and somehow lost its cutting edge. By the end of the war, many Lebanese expatriate researchers returned, freshly graduated, rich in experience and in tune with the most recent paradigms. A new administration took the reigns, dedicated to liberal arts. A struggle set in, between the old guard and the avant-garde, who sought to break with the
tradition that the importance of a research paper is inversely proportional to its relevance to real life. The University became increasingly committed to new fields of study, such as environmental sciences. It opened up this time to new frameworks of action and declared its belief in research of a practical, applied nature that would benefit the community.

The Funding Agency

The Funding Agency is the mother, the father and the stepmother of the Researcher. The Researcher fears, listens to, emulates and obeys it. It preaches pure values using sanctimonious tones, which hide its contradictions and humanity. The Funding Agency is truthful and righteous. It believes that it can help communities in the developing world find solutions to social, economic and environmental problems through research. It is very keen to protect the environment and interested in local communities. It uses terms such as holistic and synergistic without flinching. Of course, it has stopped using the term sustainable; it is sooo passé.

The Funding Agency’s brain is in Canada, with members in many developing countries. It is a strange body, because the members themselves have brains that allow them to deal with many routine issues without going back to the central brain.

The Funding Officer

The Funding Officer is one of the local brains of the Funding Agency. She is a hybrid of the Researcher and the Funding Agency. She is vested with the unenviable job of making the local development research agenda meet the Funding Agency’s agenda. This sometimes poses a problem when the agendas do not match or when the local agenda does not exist (which is almost always). Like her mother, the Funding Officer can be compassionate, firm, affectionate, authoritarian, empathetic, patronizing and well-meaning. Like her father, she can be committed, passionate, emotional, angst-ridden and a heavy smoker. Like all parents, she does not know what the children really want. That is, of course, because the children rarely know it themselves.

The Local Community

The Local Community has many mouths but does not speak. It lives in a village called Arsaal, poor and remote, dry and parched. The closest analogy we can draw on to describe the Local Community is a football. It is made up of many
patches sewn together by threads. It can be inflated at the will of the players, who keep on kicking it as long as there is a game that can be won. After that, they shelve it till the next match. When it is tired, it is replaced with another community, where the rules of the game remain the same.

The Local NGO

All the characters desperately want to believe that the Local NGO is a microcosm of the Local Community, the valve that allows the players to pump the ball. Unfortunately, it is just one of the patches that make up the Local Community. Only, it is a patch that can speak the language of Development. The Researcher holds on to it desperately, as it allows him to use the word *participatory* at will. The Local NGO clings on to the Researcher, and helps him in his endeavours, in the hope that some development funds will finally materialize. Godot may still come . . .

Play Synopsis (as told by the Researcher)

Act 1: The Birth

We woke up from the lethargy produced by the Lebanese war to find that Earth had continued to turn in our absence. We had been idle for a while, but now we were back with a vengeance. Our mission was simple, and we shared it with our institution: “That they may have life and have it more abundantly”, the words marking the AUB portal. We wanted to replace death with life, sadness with joy, and despair with hope. We knew we had something to give.

We were all graduates from AUB and had attended the same schools, although not at the same time. We had, one way or another, all been involved in the local political scene in the 1970s, then became disgusted in the early 1980s and left for doctoral studies in the USA or the UK. Our political baggage synergized with the new concepts which were flowering in the West at that time: sustainable development, appropriate technologies, community participation and environmental conservation. We dreamt of a transdisciplinary world where we all offer what we have, for the common good. We practised these techniques with local NGOs and international development organizations, which acknowledged our potential and recognized our skills. We founded Green Line, the first scientific association for the environment in Lebanon, before the cannons shut up. We worked
with Oxfam and others in Yemen and Algeria. We were ready to share our
talents and shake the academic world.

The Faculty of Agricultural and Food Sciences at AUB felt like a heavy
yoke. We were out of place in the long meetings in which insignificant
items were discussed at length, according to Robert’s Rules of Order. The
list of research projects we were undertaking, few of which had any
relevance to the real needs of our communities, made us go into
uncontrollable fits of laughter. But we were also terrorized most of the
time. We had chosen to return and had abandoned excellent opportunities
abroad, in order to be able to live in Lebanon and aid in the reconstruction
of the lives of its people. Our entry point was AUB, our alma mater, which
had given us life during the death years. We meant to give our students
what we had learned and to help them on their way through a new life,
where tolerance replaced bigotry. We uncovered a side of the system we
never knew as students.

The ultimate goal of every faculty member is survival, expressed as
rank promotion and renewal of contract. The major criterion back then
was the number of international refereed publications one could list on a
résumé. It did not matter what they were about, or how the research project
was selected and where it had been implemented. All that mattered was
the name of the journal (which ought to contain the word “International”)
and whether one was first, second or third author, first being best. We
selected our research projects to fit those criteria and quickly wrote the
results for publication. We had nightmares of papers being rejected and
mail getting lost, which happened quite a lot back in the early 1990s, when
no affordable courier service was operating. These day-to-day worries
occupied all our time and, slowly, the noble goals which once guided us
started to fade into the background.

From time to time, one of us would rebel against the establishment and
try to run on a different path. This was how, one early spring day, we – a
soil scientist, an animal scientist and an ethnoarchaeologist – ended up
trying to unravel the relationship linking land degradation, grazing patterns
and ancient folk customs in Buarij, a small village in the Lebanese
mountains. This day was to be crucial to our destiny, but we could not
have foreseen that then.

Fate gave us a push, in the form of a grant offered by the United States
Information Agency to members of the AUB faculty who had an interest
in the environment. A multidisciplinary study group was to visit key
institutions in the USA and come back to Lebanon, sit together and design
an interfaculty environmental programme. Both the process and the content of the trip were seminal to our future work. Over 15 days, we got to meet, as a team of faculty members from engineering, agriculture, policy, health and education, with counterparts in the USA. Significantly, we visited the offices of the United States Agency for International Development in Washington on the very same day Arafat was shaking Rabin’s hand (and attempting to kiss him) under Clinton’s watchful eyes. These were times ripe for change but regrettably not for all.

The process of founding the environmental programme was long and arduous, but in 1997, four years after the trip, the programme was officially initiated, managed by a committee representing all faculties and reporting directly to the higher administration. The programme, named the Interfaculty Graduate Environmental Sciences Program, offered three majors: environmental technology, environmental health and ecosystem management. The last subject reflected our commitment to ecosystem thinking as the guiding principle for agriculture and natural resource management. We were now in tune with the paradigms dominating the international scene, and we had suddenly been given the tools to make them happen.

Act 2: Strange Encounters

On our famous trip to Buarij, we encountered a flock of sheep and goats led by two dishevelled herders. They turned out to be from the remote village of Arsaal, in the Eastern Lebanon Mountains, some 80 kilometres away. Each year, they came to Buarij in the spring and stayed during the summer to graze their herds on the richer pasture of Mount Lebanon. We were then (and still are) fervent adopters of the science of linkages; and a few weeks later, a motorcade of interdisciplinary scientists, comprising agronomists, nutritionists, archaeologists and architects, made its glorious entry into the remote village of Arsaal.

Oxfam, a British charity with whom we had worked in Yemen, had a long-standing relationship with a small community group in Arsaal. It helped this community drill a deep well to irrigate some of the land and to support agriculture. We knew Oxfam’s resident representative in Lebanon very well and were familiar with their projects in Arsaal. We purposely avoided meeting that same community group in order to avoid confusion regarding the goals of our visit. Oxfam was a development aid organization and was able to offer capital for funding interventions. We were researchers...
and could not offer any tangible aid to the community. We only wanted to help through research. We were all too familiar with community-based development work not to foresee the potential for misunderstandings.

The two mayors of the village, the notables and the children in the street gave us a warm welcome, but they could not very well construe what this was all about. Why are bespectacled young men and women going around the streets, sketching the walls and arches of abandoned old mud houses in their drawing books? Why are the two nice-smelling ladies so interested in what the children had for breakfast? Why does the bearded man want to hear all about the wheat varieties they use in burghul making? They answered the best they could, but they really felt as if they were being interrogated about things they never thought about. Half the time, they could not concentrate enough and could feel the impatience in our voice. They gave us coffee, sweets, tea, water and hot bread from the *tannour* (traditional oven). They told us about their problems with domestic water supply and asked us to put in a good word with the minister in Beirut. They also asked for schools for their children, better roads in the mountains and veterinary services for their flocks.

We parted warmly, but there was an underlying feeling of frustration and doubt on both sides. We had quickly understood that we were not alike and that the ravine between us was deeper than we could fill with our mutual goodwill. In the car, we scientists politely exchanged our impressions of rural life, bracing ourselves for the three-hour journey back to the safety of conventional research. Suddenly, a swerving truck appeared in the rear-view mirror, loaded with at least five tons of huge rocks and driven by a gesticulating giant. We gave way, and the truck overtook us, only to fishtail us, imposing a stop. A huge red-bearded man alighted and approached us. We looked at each other, in a panic, quickly trying to remember how we could have insulted this giant or one of his kin. We even briefly considered backing up and fleeing away, when he opened the door to our car and grinned, joyfully proclaiming, “Welcome to Arsaal!” He was a member of the community group Oxfam had been working with, and he was eager to help us. The Arsaal Rural Development Association (ARDA) was keen to know us and wanted to support us in our activities, whatever they may be. He knew AUB and had even visited it once; his brother worked on the same street.

Our next meeting with ARDA, a couple of weeks later, brought us face to face with a part of our past we had all but forgotten. ARDA counted, among its founders, members of leftist groups who had been active at the
onset of the Lebanese war and whom we had met informally a few times. We spoke the same language, that of development, poverty and equity, and also of environmental conservation, sustainability and capacity building. They were familiar with Arsaal’s problems and had an agenda: to combat poverty and conserve natural resources. We were made for each other.

Act 3: Where North Meets South

With ARDA, we held long discussions about the needs of the Arsaali community. They needed everything. ARDA’s strength was that they were able to understand the limitations of development research and to accommodate them. Concerns about the sustainability of resource use were expressed by the Arsaalis. They wanted to learn more about their lands in order to better plan their development. They wanted to forecast the future of herding, as pastures were getting increasingly impoverished and more and more people resorted to hand feeding with concentrate. Together we found fertile ground and worked it in depth.

During our initial days at the Faculty of Agricultural and Food Sciences, we had established good collaborative links with ICARDA, in Aleppo, Syria. It was the closest thing to what we then wanted to be. It did research on real issues and tried to solve real problems. It was starting to be concerned with livelihoods rather than with just breeding new varieties or designing new farming systems. It had explored the rural areas in the Syrian Badia, and we had been involved with it in a number of projects. We informally called upon ICARDA to help us crystallize our thoughts and to appraise its interest in a partnership in research in Arsaal. A British socioeconomist we had previously worked with agreed to make the trip from Aleppo to visit the village.

To reach Arsaal, one must pass through Baalbek, the City of the Sun-God. It is also the City of the Tribes and the City of Hizbullah. On that specific day, Hizbullah and the Tribes had fiercely fought over domination, and there had been a few dozen deaths. The British embassy had imposed a travel ban on British citizens, but we took to the road anyway. Baalbek was a desert, with armed militiamen lurking in the shadows of the Roman columns. There were sporadic machine-gun fire and what sounded like rolling thunder but in reality were dynamite sticks thrown to honour the dead at their burial. Research on the edge.

With ICARDA, we quickly initiated a small research programme to look at farming systems in the Bekaa while some of us were pursuing our
own research projects on appropriate technologies. One bright fall morning, we met the first funding officer from IDRC, who had been attracted by those technologies. She was sharp as a knife and knew exactly what she wanted: fully fledged field research at the community level. She told us about IDRC and its interest in people, land and water. It had several ongoing projects in the region. AUB had received a few grants in the past, but there had been a lull during the war years. We talked about Arsaal and took her on what was to be the first of many visits. We learned about the “people, land and water” agenda in more detail and discovered that it overlapped with ours and with local priorities. We composed a concept document on the strength of which we were invited to Egypt, to the regional office of IDRC, to develop a full proposal.

If our meeting had been weird, our proposal development can only be described as unusual. Here we were, applying for a major grant in community-based research, without as much as a car with which to go to the field. So far, we had been using our own vehicles and renting an old truck on location. Arsaal covers 300 square kilometres, and it would take quite a bit of rental to cover the area. Moreover, the local trucks were intensively used for night smuggling over the Syrian border, and many were riddled with bullet holes. There was no telling when the Syrian border guards would take us as targets. But purchasing cars for projects was highly unorthodox for IDRC. We finally agreed to purchase a car, which would be given to the community upon the end of the project. Since then, the Faculty of Agricultural and Food Sciences has purchased four more cars for community-based projects. And the black car, the trademark of the Arsaal project, will soon become the property of ARDA, to be used in its rangeland rehabilitation programme.

**Epilogue**

It feels odd and sad that we should be telling this on the same day we learned of the death of Khaled, the “Sergeant”, from an undiagnosed stomach cancer. He had been in pain for several months, and local doctors had told him to stay away from spicy food. The mere fact that this could happen to a 47-year-old man, in a village 100 kilometres from Beirut, is proof enough of the level of neglect, underdevelopment and the lack of basic services that still exist in Lebanon today. Khaled was a vociferous campaigner for incorporating research into development intervention, something we could barely do in the IDRC-supported project. His
contribution to creating the concept of “embedded research” was crucial. Khaled had been in charge of the rangeland rehabilitation programme ever since it was started. He will never drive the black car.

**Back to Cactus Dream World**

It became painfully obvious to El Harid that there were too many players, too many agendas and too many words. Frustrated university professors operating within the confines of a system that is not conducive to work in community development, local communities uneasy working with academia, research priorities too often disconnected from life’s uncertainties . . . As he ponders these issues, El Harid drops off to sleep and is dreaming again . . .

The first meeting is held. There’s a lot of talking, but no one listens. El Harid is bombarded by loud statements and promises. He only comprehends fragments of the discussions. “Our research shows that participatory communication . . .” “The project must meet the requirements and expectations of the funding agency . . .” “We speak on behalf of the local community . . .”

Unable to bear it anymore, El Harid clears his throat. Finally, all is silent and the ancient cactus is suddenly aware that every gaze is turned on him. He surveys those expressions of surprise and half-concealed amusement and begins to stammer, all the time trembling a little, more from indigance at being ignored than from fear, “I don’t want any of this!”

He steadies himself, “I want to see another play – a play where the actors have no strings.”
III

Germination

Reality is like a human, with two faces.

Amin Maalouf

Ottowa. Mid-March 2003. –45º. A room with a bay window, overlooking a frozen lake; a writer sits at a desk. Shadi Hamadeh, supported by a sabbatical award from IDRC, is working on chapter 3 of this book. At his side, an open newspaper screams the headline “Shock and Awe – Bringing Democracy to Iraq”. His senses are frozen.

A sudden warmth permeates the room. El Harid is there. He surveys the scene, understanding.

“Tell me about the participatory approach you adopted in Arsaal,” he prompts.

“How can I write about local participation when in the Arab world the outlook is so bleak?” responds Shadi.

“But I heard from Arsaal that people are taking positive roles.”

True. Even with all the frustration and difficulties that came along with working on a participatory level in a small research project, change can happen.

And the writer starts to put these words down.

Participatory research does not live in a vacuum and is never neutral. It diffuses into the existing system and is highly dependent on the context. Taking the time to understand the context is essential. The preliminary Dryland Management Project study had provided us with a basic understanding of the Arsaali community in terms of sociopolitics, economy, environment (resources and their management) and culture.

In Context

A historical perspective on the development of various socioeconomic factors affecting land use in Arsaal was now available to the research team. The decline of the traditional agropastoral system was triggered by official land surveys undertaken in 1945, along with the introduction and successful production of fruit trees in the 1950s. Both factors led farmers to expropriate
communal land previously managed for grazing purposes and plant stone fruit trees on it. The trend grew during the war owing to the breakdown of local authorities and the reverse migration from cities. The same period witnessed the development of rock extraction and quarrying activities, an intensification of smuggling across the Syrian border and the enrolment of young Arsaalis in local militias and later in the national army and security forces. All of these rapid changes prevented the development of a sound land management strategy. This state of socioeconomic and political disorientation was further exacerbated by the absence of national policies for rural development.

The overall picture reflected a society in transition from an agropastoral system to a more diversified livelihood integrating rainfed fruit production, quarrying and related activities, and off-farm jobs in addition to the traditional small ruminant and cereal/pulses production. Traditional management strategies based on community consensus had given way to conflict over land use among animal herders, fruit growers and quarry owners, with the last group displaying increasing sociopolitical influence. The conflict was highly entangled in the traditional family web of the village. In spite of the ramifications that these conflicts introduced within families and clans, the traditional family and clan structures showed a good degree of resilience. In summary, the Arsaali society was in a prolonged state of disequilibrium, crisis and crisis management.

Nevertheless, the partial weakening of the traditional family power system as a result of the enrolment of hundreds of Arsaali youths in political parties and militias during the 1970s and 1980s facilitated the birth of new social entities such as NGOs and cooperatives. In the mid-1980s and early 1990, Arsaal witnessed the establishment of three NGOs and one cooperative. However, since then these groups had been under the influence of traditional as well as political forces. With a complete absence of governmental development programmes, the local organizations whose aim was to develop agriculture and rural life in the village were attempting to fulfil the role which should be that of development agents, supported by occasional interventions from national and international groups. In addition, these organizations had been undertaking programmes to expand training for income-generating activities such as machine knitting and carpet weaving for women and plumbing and construction skills for youth. However, the scope of these programmes was limited. At the same time, other development and research activities were ongoing or planned in the Northern Bekaa. These included the first large project financed by the
International Fund for Agricultural Development (IFAD) to develop livestock production in the Bekaa and an integrated rural development project funded by UNDP which aimed at encouraging farmers to replace their illicit crops with viable alternatives. There were also specific research projects on livestock systems, crop rotation and range rehabilitation carried out by ICARDA. Several other very small projects were undertaken occasionally by NGOs, but their impact remained minimal.

The breakdown of the traditional resource management practices, which occurred in 1965, led to the dismantling and complete paralysis of the local municipality. This situation remained during the decades of civil unrest because the new emergent forces (political parties and militias) were more involved in national politics than in local resource management. This chaotic state of affairs continued following the return of hundreds of youths from Beirut, driven back by the demise of the leftist militias after the Israeli invasion of Lebanon and by their hopes of involvement in smuggling activities across the Syrian border.

The year 1998 saw the election of the first municipal council in 34 years, and the community acquired an administrative body which faced the challenge of managing several forms of land use and their conflicting requirements. The election, however, was largely viewed, and conducted, in terms of familial alignment with an emerging political majority weighing in favour of the quarrying sector, thus leading to the formation of a municipal council that knew little about local administration and lacked the vision required to develop local resources. Municipal candidates elected to the council were not screened based on any criteria involving experience and skills in the field of local development. A quick look at the council’s action plan revealed that it dealt with basic infrastructure. Issues pertaining to the management of natural resources were absent. The only natural resource issue it addressed concerned the presence of quarries on communal land. Herders, who collectively own 8% of the total ruminant population in Lebanon, have been unable to constitute a pressure group among other sectors of the Arsaali economy. Their plight is due to the fact that owners of the largest flocks (500 to 1,500 head) spend prolonged periods of time outside the boundaries of the town, hence depending very little on local pasture. As for owners of small and medium-sized flocks (who constitute the vast majority of flock owners), revenue from animal husbandry ranks second. This activity depends entirely on hand feeding and grazing at the outskirts of the village.
As for the owners of orchards, their fate is similar to that of a large number of Lebanese in rural communities, who fail to recognize the municipal council’s potential role as an organization dealing with production issues but view it only as one providing basic public services and issuing construction permits. This classical understanding of the role of municipal councils has not evolved much. Consequently, the council was never perceived as a potential local administration which could play an active role in a variety of issues. In contrast, the owners of quarries and sawmills were able to join forces in creating a strong lobby in Arsaal. The strength of this union was demonstrated during the municipal elections by these owners’ level of participation: out of 42 candidates who joined the election campaign, 11 were quarry and sawmill owners, 5 of whom were elected to the municipal council.

These unstable conditions have had repercussions on the village household, particularly the division of roles between the genders and the expectations of Arsaali women.

**Different women, different roles**

Ethnographic data gathered by Michelle Obeid (1998) suggests that, in a seemingly homogeneous culture, different women respond in different ways to a structure that is restricting. In this sense, women conform diversely to the traditionally expected gender roles. They opt for a variety of means available in order to cope with the constraints of this structure. A continuum was drawn whereby at one end there is a total conformity to traditional roles and at the other end there is almost a breakaway. In between are various endeavours to cope and interact with cultural norms and expectations.

As Obeid explains, at one end of the continuum is a category of conforming women who are quite satisfied with the conventional dichotomy of the male being the breadwinner and the female the homemaker. Roles are performed across a public/private divide. This trend is noted mainly among the wives of relatively well-off villagers. What is significant is the self-perception of women as conforming to the “correct” divisions as opposed to a desire to deviate by striving for other means of self-realization.

Another category finds some women who feel oppressed by a culture that allows men to inflict physical or emotional abuse on women. They conform by performing duties and services that they do not value, merely to meet their husbands’ and society’s expectations.
A third category embodies women who have assumed a male role as a result of their husbands’ absence due to abandonment, death or migration. Intrinsic to this category is the fact that, although these women assume a new role, the ongoing social changes have not yet allowed them to relinquish their traditional female roles. Hence, one sees women who are decision makers, income providers as well as supervisors of otherwise male activities. It is in this category that women perform construction work, male agricultural activities, as well as other roles and activities ascribed usually to men. Despite this shift in boundaries between the male and the female role, these women make it a point to stay within prescribed norms in the sense that they cannot act entirely alone, particularly when their men are still present (in the case of migration).

The next category includes young women who are enrolled in university. This group emerges as a younger generation that has analyzed and evaluated ongoing constricting cultural norms and understands the importance of change enhanced by education. However, geographical, socioeconomic as well as cultural restrictions act as obstacles to higher education. The remoteness of Arsaal, the cost of commuting to attend classes, and attitudes that inhibit the pursuit of education by projecting contradicting messages to women deny them the right to a campus life and the proper choice of academic specialization. Education has started to have a new value which creates ambivalence when pitted against the prospect of marriage and domesticity. This category of women strives to negotiate solutions to cultural impediments and to test the limits of the structure.

The end of the continuum comprises uneducated women who have passed the acceptable age for marriage and thus have become part of the unfavourable category of “old maids”. Having failed to realize their prescribed homemaking role, they have become a burden to their families. Hence, they try to lessen the burden by achieving independence, which they believe comes with economic productivity and autonomy. Unlike the other groups, women in this category exhibit remarkable independence in terms of decision making and mobility inside and outside the village.

These categories portray the types of strategies women employ to survive in society and demonstrate that gender roles are susceptible to change. Even the men in this traditional society appear to recognize that gender roles are gradually evolving to adapt to the changing environment.
Genesis

The project seed was now ready to be sown in the dryland context of Arsaal. For a seed to germinate in such a desiccated land, extra care was needed. During the preliminary phase of the Dryland Management Project, cooperation with schoolteachers was sought owing to the absence of a governmental or non-governmental extension structure. During that period, we came to know the existing NGOs in the village, and ARDA in particular. Once aware of our presence, ARDA became very interested in our research activities and enthusiastic about the possibility of implementing a development research project in the village. As related in the previous chapter, our first encounter with ARDA occurred when one of its members, a bear-like bearded guy nicknamed the “Giant”, chased our vehicle in his truck as we were leaving the village, insisting that we visit the association’s office and be introduced to its activities. This first encounter led to many others, and we were pleasantly surprised by their disposition to cooperate with us on the project. Our contacts during the preliminary phase, including extensive discussion with ARDA, provided the raw materials from which the project was actually conceived.

It became crystal clear that some kind of medium was needed to facilitate interaction among the various local beneficiaries and other groups such as researchers, development workers and NGOs. The presence of such a medium would provide a platform for different stakeholders to assess and develop a common understanding of research and development needs and possible solutions to the lack of extension structures.

A local users network (LUN) was thus conceived to bring together the different stakeholders and fulfil the critical functions of participation, communication and capacity building. We later realized that the network came to constitute the engine that carried the project forward, the fertile medium that nursed the project’s seed into germination.

The concept

The network concept was based on a cursory review of literature relevant to communication for development in the Arab world in addition to a review of non-documented communication practices. Our local experience and, more often, intuition also helped shape the network. Published information of relevance to communication for rural community development in the Arab world is scant. One key contributor to this field is Acunzo (1998),
who planned a communication programme for natural resource management in the Syrian steppe, where the environmental and socioeconomic conditions are extremely similar to those in Arsaal. In his perceptive analysis of the social factors that have led to resource degradation, he attributes the major cause of the problem to the breakdown of the traditional tribal-based rangeland management model, the *Hema* system. He recommends the establishment of a consultative decision-making process involving local groups, tribes, the cooperatives and the state. This body would serve as a platform for communication between the different stakeholders.

In the Arab world, the traditional way of communication and resolving dilemmas is largely face-to-face interaction. This forms the basis of the tribal *majlis*, during which issues are brought up in the community, usually at the house of the community leader.

The strategic role intended for LUN was as a participatory interactive platform based primarily on face-to-face interaction in informal group meetings as a variant of the traditional tribal majlis, this time extending beyond the community to involve all development stakeholders: the community, researchers, development project workers and the government. One important characteristic of these stakeholders is that they belong to different cultural groups and to different organizational cultures. The community of Arsaal is a traditional Sunni Muslim rural community of the Arab Eastern Mediterranean. Many of the researchers and the support staff are highly westernized and follow a classical academic culture. The development project’s staff include members of Western origin and are influenced by the donor culture.
Incubation

At the project inception, ARDA served as an entry point to the community and a nucleus to the network. Representative groups of farmers were identified for the purpose of determining needed areas of research and discussing research objectives. Non-monetary incentives were introduced for increasing initial involvement in the network: introduction of adapted fruit trees and shrubs, improved livestock management practices and soil conservation measures. Fruit growers expressed their interest in acquiring technical know-how related to standard orchard management and pest control techniques. Livestock owners needed specific technical intervention to improve the productivity of their flocks, such as animal health, improved feed resources and rangeland rehabilitation.

After consultation with the local NGOs and meetings with the local authorities, the mukhtars and the acting municipal officials (the municipality had been dissolved since 1965), the mechanics for the establishment of the network were defined so as to ensure the representation of traditional decision makers as well as new emerging forces. ARDA played a facilitating role in contacting the various groups of users (cherry growers, flock owners, women, etc.). Several meetings were held either with the whole network or with representative subgroups of different production systems. The objectives of the project were discussed and evaluated, and network members agreed to actively participate in the project activities. The original group of representative farmers constituted the nucleus of LUN.

The structure of the network was left as loose as possible with a view to maintaining maximum flexibility. The decision to participate in the network was left to those who saw a common benefit that the network could offer: farmers, local authorities, local and national NGOs, and scientists. In this respect, scientists had a learning and teaching dimension, NGOs were reinforcing their community links and administering necessary training programmes, and farmers found the incentive in trying out new techniques.

Small task-specific working groups were established within the network. The need for these working groups was identified by members of the network who shared a common interest.

It was hoped that the flexible structure of the network, the common interest of its members and the rewards to all involved in it would ensure a level of sustainability through its adaptive development. The rewards included benefits arising from farmer-to-farmer training, productivity...
improvement as a result of scientific research, improved training capacity of the participating NGOs, and reinforced links between farmers and the local authorities.

**Evolution**

As the network grew, our understanding of communication principles evolved with it, and the need to define a workable, meaningful typology or a system of user categorization that considered the users’ subjective nature became obvious. Specialized working groups were born and later developed into three sub-networks: two of these, for livestock herders and fruit growers, dealt with the main production sectors in the village; the third addressed women’s needs. Local coordinators were designated to coordinate each sub-network. Specific on-farm trials were developed, discussed with the farmers and implemented.

The sub-networks for livestock herders and fruit growers comprised various research and development players in the Northern Bekaa: local authorities, regional deputies, as well as representatives from LARI, ICARDA, the Ministry of Agriculture, the IFAD project on the rehabilitation of the livestock sector, and the UNDP integrated rural development project. A list of recommendations and sector-specific action plans were drafted, and it included specific interventions pertinent to each sector, such as feed resources, animal health, range management, integrated livestock–crop production, tree vitality, integrated pest management, soil erosion, soil fertility management and marketing.

The sub-network for women brought together women from various socioeconomic and political groups in the village along with gender researchers and trainers in the project team. It explored gender-related issues and focused on empowering women by enhancing their socioeconomic status. Possible income-generating activities were explored, and this resulted in the establishment of carpet/rug weaving and food processing facilities.

To ensure that gender issues were dealt with sensitively at each stage of the process, especially with respect to the adaptation of new techniques, network management modalities, and communication and popularization strategies, the help of the local NGO was solicited. Women’s participation in the network was facilitated by ARDA and by the presence of the project’s gender specialist, who resided in the village for prolonged periods of time in both phases of the project. She became a popular figure among the locals,
and her presence in the village constituted the ultimate form of participatory research: living with the community. “Michelle is one of us. She can really listen and understand us, while you guys come for a couple of hours every week on a rushed visit and then disappear,” snapped Halima, a lady with hazel eyes and a grudge who was in charge of women’s activities at ARDA. “Do you think our village is a fast-food outlet?”

From the outset, the project made sure that network members were representative of the different resource user groups in the community. This arrangement helped ensure that the needs of the community at large were voiced in the network, which meant that the solutions developed were relevant to the rest of the community. This, by itself, greatly enhanced a widespread dissemination of knowledge.

Moreover, a specialized unit in the network, the Environmental Forum, was created to catalyze knowledge sharing with the community at large. The forum members were Arsaali youths, mostly schoolteachers, who were trained by the project team in the good practices developed by the network and had as their mission the widespread distribution of the practices. To do this, they primarily used face-to-face interaction, especially during critical periods. Additionally, they made use of complementary materials, such as the best practice booklet developed by the project, to summarize and simplify project findings in a language accessible to farmers. The forum also served as a communication channel between the community and LUN through which refinements and remedial measures were identified. Most importantly, the forum helped develop a critical mass in the community, involving the young generation, thereby raising its awareness, increasing its capacity and so further enhancing the sustainability of communication and development efforts.

In its third year of existence, LUN was adopted by a regional project coordinated by ICARDA as one of its focal points for community participation. The Mashreq–Maghreb project aimed at improving crop–livestock integration in dry areas of MENA. Consequently, Arsaal hosted several farmer workshops involving farmers, scientists and development workers from the six countries where the project was being implemented. Several scientists from the Arsaal project were also involved in the Mashreq–Maghreb project, as its Lebanese component was implemented by LARI in the Bekaa. Eventually, the LUN structure was transplanted by the Mashreq–Maghreb project to the Yamouneh area and led to the establishment of a cooperative of livestock herders in Deir El Ahmar, a
village located on the eastern flank of Mount Lebanon. The two cooperatives, Arsaal’s and Deir El Ahmar’s, were involved in joint activities and farmer-to-farmer training. They have been coordinating their activities and developing common strategies to improve small ruminant production in the Bekaa area ever since.

**Tools**

The tools and practices used by LUN were mainly interpersonal. They included regular, issue-centred, round-table meetings for members of the sub-networks, community outreach by students during their training programmes, “live in the village” and “work with the farmer” approaches (one student did not know how to use an Arabic latrine and stayed for three days without going to the restroom until she discovered the existence of a Western latrine at ARDA!), joint field implementation of good practices in natural resource management, short video documentaries on different issues (which also served as powerful participatory tools), newsletters, a website and, most importantly, a series of workshops on different themes related to natural resource management and community development.

One important feature of LUN was its training and capacity-building component, which worked as a booster feeding into the dynamics of LUN and providing a self-reinforcing mechanism to the whole process. Clever, strategically timed incentives were also employed to initiate and facilitate the introduction and adoption of technical options. For example, herders, traditionally reluctant to reduce the number of their animals as a risk management strategy, were encouraged to practise basic culling to reduce their flock size and so alleviate pressure on grazing lands, and in return they were rewarded with an amount of a cheap feed supplement proportional to their culling intensity. Once the practice was tried out, farmers were satisfied with the general improvement and productivity of the flocks. Moreover, money generated from the sale of culls would eventually be used by the herders to improve the nutrition of the smaller flocks, thus enhancing their willingness to adopt the practice.

Art and visual communication tools were also part of the LUN arsenal. In its second phase, the project developed a partnership with Zico House, an alternative cultural centre specializing in the use of art for community development. Video production was experimented with in an effort to involve the community in dialogue and conflict resolution. The premise
was that imagery has the power to shed light on aspects of conflict and dissent. More importantly, it constitutes a platform for freedom of expression for marginal groups and provides a visual reference of a specific development context over time. Interactive puppet shows targeted children and motivated them to understand their role in the natural resource context. Even mimes were employed in a workshop targeting policy makers.

Special emphasis was placed on evaluating and analyzing the observations and feedback of network members. This was done with the purpose of assessing the response of the community to the new techniques as well as the adaptation of these techniques to community needs. Farmers’ findings were fed into the research process by way of regular meetings with research team members. These farmers constituted a platform whose purpose was to spread research findings to others in the community and exchange observations. The input and feedback of network members constituted the main elements for use in establishing intervention strategies.

**LUN Special Features**

The network functioned as a self-reinforcing interactive participatory communication platform and proved to be an effective and innovative experience. Through LUN, the project promoted economic development, fostered sociopolitical empowerment and exposed the community to other development interventions. These achievements are presented in the coming chapters. Here we shall describe some special features of LUN that appeared in the course of the network’s evolution.

**Conflict resolution**

The shift in farming systems in the 1950s from agropastoralism based on seasonal transhumance and annual crops to a more sedentary system based on fruit trees created a conflict over land use between livestock herders and fruit growers. Pastoralists, who used to roam freely, were forced into more marginal lands. The conflict was exacerbated by the absence of local or state authorities and the breakdown of traditional conflict resolution mechanisms. LUN provided an environment in which conflict resolution could take place, as the needs of both parties could be voiced and compromises explored. Early meetings held to discuss conflict issues among the parties revealed a reluctance to engage in dialogue. After a few stalling sessions,
our communication unit suggested using visual images to facilitate the dialogue initiation process. Initially, the representatives of the conflicting parties who refused to discuss the conflict were interviewed and filmed separately. Then the video was played in the presence of all parties followed by a discussion which was also documented on film. The final step was to play the new video to a larger audience, implicating more people from the whole village, until a positive dialogue started emerging from the audience. The moment of consensus was also filmed, and a local facilitator formulated the consensus into a set of specific recommendations for follow-up. For instance, the conflicting parties agreed to refer to the local authorities (municipality and mukhtars) and entrust them to develop and recommend different scenarios for land use management in the village.

Another technical option, which was explored and agreed on through this process, was the intercropping of vetch in the orchards. Vetch, a legume, enhances soil fertility, protects the soil from erosion, and can be harvested to serve as animal feed, thus easing the pressure on the lands under competition.

Local agenda development

LUN members developed an agreement on local needs and promoted local action plans. LUN meetings provided the space for communicating these plans to decision makers. For example, a workshop on livestock and range resources was organized and attended by the local authorities, government representatives and 150 farmers. Participants agreed on a list of recommendations and follow-up actions. A follow-up mixed committee (scientists, government and farmers) was then formed to work on the implementation of these recommendations, such as lobbying the Ministry of Agriculture for the establishment of an extension office in Arsaal.

Research capacity building

The development research experience of academic institutions in the Middle East is generally weak. LUN helped build the capacity of the research team in participatory action-centred research. It sharpened the interdisciplinary thinking and skills of the project team and eventually helped shape their research agenda according to local needs. When the project was initiated, responsibility for research output was distributed among project scientists
according to their specializations, such as soil and water scientists, livestock and range specialists, horticulturists, socioeconomists, nutritionists and gender specialists. These groups operated semi-independently and presented their research results separately to be later integrated in a final report. These research results seldom had a significant bearing on people’s livelihoods, as they put resources rather than people at the centre. As communication evolved between LUN members, the need for a people-centred, integrative approach became apparent. A new framework for action – sustainable livelihood – was adopted and formed the basis for planning and implementing project activities.

Vehicle for development

LUN constituted the vehicle for addressing the pressing needs of the community in natural resource management. A participatory land management process was initiated and resulted in consensus on land use planning in the village. A range management and rehabilitation programme was started and included the establishment of a nursery for forage shrub production, range protection, rehabilitation agreements with the municipality, and intercropping vetch under fruit trees in orchards. Rainwater and snowmelt harvesting techniques were developed and introduced and are currently being tested in several locations.

Power of attraction

The availability of a communication platform attracted other initiatives to Arsal. A large number of research and development projects chose Arsal as their work site. They included the UNDP–GEF agrobiodiversity project, the ICARDA Mashreq–Maghreb project and the German Agency for Technical Cooperation (GTZ) range management and rehabilitation project. Their involvement resulted in spin-offs for the community and network members at large. Development projects would plan their interventions with research objectives in a concerted manner and share the costs of farm trials.

The synergy among the various initiatives saved a lot of time, money and effort. Research became cost-effective and some “extravagant” mini development actions could even be afforded. LUN had an intrinsic added value named efficiency. What was once an isolated and forgotten village in Lebanon became a real-life laboratory for research and development.
Flexibility

LUN was able to accommodate change. It started out with a few members and a research context and went on to include multiple stakeholders in a research and development context. Interests and priorities alternated from mainly technical to socioeconomic and institutional undertakings.

Finally, LUN was able to adjust to the evolution of the political scene in the village and quickly moved to include the newly elected municipal council at the centre of its activities. The municipality was even influenced by LUN to rearrange its priorities and direct resources towards pressing community needs.

The Dark Side of LUN

Communication for sustainable resource management involves establishing linkage among all stakeholders; developing a common understanding, language and channels for participatory communication; and responding to information and training needs (Ramirez 1997). A thorough understanding of the system of the communication partner is crucial.

LUN achieved its goals by establishing an interactive communication platform for information exchange, knowledge sharing, and the development of issue-specific action plans. It has succeeded in accommodating the conflicting agendas of different stakeholders (local actors, researchers, research and development institutions, and donors). Although its merits were recognized at the national and regional levels, the working of LUN has not been without trouble.

A recent evaluation of the social institutions in Arsaal (Baalbaki 2002) confirmed LUN’s achievements but underlined some of the obstacles to structured communication within the network, such as kinship ties and familial and tribal conflicts. Moreover, in his evaluation of the project’s policy influence, Brooks (2003) described the participatory level as very mixed. The project, according to his analysis, operated mostly and necessarily through intermediaries, mainly ARDA.

Participation is politics

The project made every effort to involve as many local partners as possible. Initially, many local players met it with a sense of suspicion. Suspicion is
a major obstacle for effective communication, and AUB researchers were even more a focus of suspicion. The villagers were uncertain as to why “eminent” AUB professors would leave their comfortable offices overlooking the Mediterranean Sea to come and stick their noses into the dirt and dust of a village in the middle of nowhere. It was unlikely, therefore, for them to voice genuine expressions of needs and concerns. Naturally, trust was built over time and resulted in a candid and forthright interaction with the locals.

Only ARDA realized, from the first minute, the importance of cooperating with such a project. “We were very keen to work with the project so as to try to boost our position in the local equation against traditional forces in the village,” Kassem, ARDA’s president at that time, explained candidly. “Besides, we saw the project as an opportunity to link with the outside world and create a dynamic process of social change in the village.” In addition, ARDA was convinced of the importance of development research as a prerequisite for attracting development projects to the village. ARDA members would elaborate their own theory about participatory research: “The existence of a local facilitator transcending traditional structures, such as ARDA, is imperative for the success of the whole participatory process. We can talk your language – meaning development jargon – and are able to communicate effectively with development professionals. At the same time, we know the local language with its customary and traditional concepts and, more importantly, we have local indigenous knowledge and would spare you the time and effort searching for it. We are fully aware of our ambivalence; we are looking for social change while carrying our heritage, with all its complications, in the back of our minds.”

Short-term research projects often have no alternative but to work with the most collaborative and the most socially concerned people, which, _ipso facto_, results in a bias in the nature and extent of participation. Obviously, ARDA was not representative of the community. It was made up largely of younger people who had communal values. Working with ARDA was not merely convenient; it was essential. “Participation crosses gender and class lines with difficulty. If ARDA had not existed, the project would have had to create it,” concluded Michelle, the resident anthropology student, in her research diary.
Hidden agendas

Different participants in LUN had different agendas. LUN was able to accommodate different agendas as long as these were clear and overt. Problems arose when people involved had hidden agendas. For instance, it was revealed that some farmers who joined LUN wanted to draw benefits in the form of incentives through a patron–client relationship (wasta) without a genuine interest in LUN goals. Wasta is an integral part of Lebanese political life at all levels, but especially in rural traditional settings, where there is widespread expectation that needs will be met more quickly through the exercise of personal relations than through a structured institution (Makhoul and Harrison 2002; Joseph 1997).

At one point, the “Sergeant”, who was the local coordinator of the sub-network concerned with integrated crop–livestock activities, became extremely frustrated by the attitude of some herders. “Listen to me, we are a backward society, take your participatory fad and go practise it in Europe or America.” He was genuinely expressing a view echoed by many “civilized” Western academics (Chambers 1983; Midgley 1986), that the very idea of community participation often externally imposes concepts based on Western ideology rather than local practice. If community participation is to be encouraged, it cannot be divorced from its political context and consequences (Dudley 1993). “Farmers are being incited by their family leaders to come and abuse the network or else stain the reputation of ARDA and its members. Do you think they would let the farmers truly participate and escape their influence? They are going to fight the network,” shared one source. Participation is empowerment and empowerment is politics. When traditional power is challenged, it generally retaliates. Community participation should be recognized for what it is: an externally motivated political act (Berger 1974). And as succinctly worded by Chambers (1983), “However much the rhetoric changes to participation, participatory research, community involvement and the like, at the end of the day there is still an outsider seeking to change things . . . who the outsider is may change but the relation is the same. A stronger person wants to change things for a person who is weaker. From this paternal trap there is no complete escape.”
Focus on research rather than development

Arsaal is a poor, marginal village where the basic needs of the community are largely unmet. LUN was conceived within the framework of a development research project and, while it was able to contribute to improved livelihoods through various incentives, its emphasis was on research. Conducting research which involves communities and deals with livelihood issues raises the expectations of those involved in the research. LUN used material incentives to involve community members. This method usually relieves pressure on the researchers and helps improve people’s livelihoods (Brzeski et al. 1999). However, incentives may turn into subsidies and mislead target groups. No matter how much the incentive is a result of the research, improvement in livelihood can be slow and disappointing, which can inflict devastating effects on the individuals who devote much time and effort to the research. “Every house we go into, every farmer we talk to, invariably the same question would come up: What do you have to offer? Then the whole conversation will shift from a research-oriented to an aid-oriented mode and an expectation of assistance which may never materialize,” observed a local surveyor involved in participatory work.

Participation, a Myth?

Participatory concepts dominated the scene of development theory and practices in the 1990s, and participation continues to be a development watchword in the first decade of the 21st century. Yet, critics have voiced the concern that the new concepts of participation and sustainability only help to foster a gentler image of development than usual (Georges 1992; Escobar 1992). Worse, they may serve as Trojan horses that bring a new level of global and environmental restructuring processes directly to rural communities, bypassing national institutional buffers and preempting critical review (Rocheleau 1994). These criticisms seem more than justified, since the consequences of misguided development (even in participatory disguise) are both real and serious (Mies and Shiva 1993). Moreover, participatory techniques can be manipulated to produce the effect of centralized power in the name of devolution if it is not coupled with an effective shift of power, as observed by Triulzi (2001), who examined how participatory approaches were used by state authorities to assert some form of control over Syrian pastoral lands and their indigenous inhabitants. In
effect, the representations of indigenous people and their environment were rhetorical images that satisfied the conceptual demands of donors and agencies.

Cacti Participation

One late evening, El Harid settles down for the night after a long day working alongside the researchers and locals in LUN. He reflects on how hard this first year has been. His head aches as he ponders over the lack of communication around him. He has so many unanswered questions. He doesn’t know what is really wanted of him. He falls into a troubled sleep . . .

Before long, he is dreaming again. He hears music; it’s folklorish, an old Arab melody. A party is taking place and a group of people are dancing Dabke resplendent in folk dress. Rich colours jump and turn; bright scarves are tossed and waved. Such a beautiful scene. A song begins and poetic words float in the air:

Take pride in your ancient ways,
Passed down by your forefathers,
We understand the land best.

Wave upon wave of white scarves, stamp upon stamp of feet . . . The music fades, but he can still hear the refrain, “We understand the land best.” Suddenly, a bright light blinds him for a second and then the steady thump, thump, thump of some music. A song bursts out, “Billy Jean is not my lover . . . uh!” He is at the scene of a party, people are dancing the twist. Some foreign visitors are present, sampling arak and taboule, all smiles and nods.

“Welcome. Like to visit Baalbek, the Cedars?” says a guy in jeans and cowboy hat. “Me help you, me make discount. For you, only $50.” Everyone is all smiles and nods. Understanding.

Ring, ring, ring, ring, ring.
Crying children and an unbelievable stench fill the air.

“Hello?” A man is talking on the telephone. “Could two hundred more tents be delivered by the end of the week? Thank you. We also need up to a thousand polio vaccines. Any chance? Great! No, only a month more. Well, I really care about making a difference here. Of course, I miss my family, but it is OK. It’s worth it! Bye.”

The light falls on the badge on his hat – UN. The golden glow of the badge fills the whole scene.
El Harid wakes up with a start. Questions still resound in his mind. What is really true? Which path is the right one to take? What do we need the most?

Getting up, he prepares for today’s meeting by putting on his belly dancing outfit . . .

*Participating in belly dancing*
The day of truth finally arrives. I am attending a conference held by the research team to present the results of their project in Arsaal. I am anxious to see what the outcome will be. For so many thousands of years, I have witnessed intervention in many forms, in most cases with disaster in its wake. Conquerors invaded with the intention to improve the lot of the "barbarians", forcing new ways on the local population. Later, others came to preach but, often, slaughtered instead. In the name of change, national dictators were raised up only to bring down civilization as we know it. Even developmental efforts are guilty of bringing good intentions and new technologies that failed and were left rusting in the desert. I have seen ridiculous sights, like that of Bedouins “resettled” in concrete complexes living outside in their tents while their animals enjoyed the new accommodation!

At last, something new has come along, a fresh approach: participation on a voluntary basis and I have been part of it! I could feel the tension rising among the research team members as their creation is about to be unveiled. I hold my breath as the big screen lights up and the team leader introduces the presentation as “Sustainable Improvement of Marginal Lands in Lebanon”.

The two project phases analyzed the trend in which land use was changing in Arsaal, defined its impact on the natural resource base, evaluated the sustainability of the major farming systems (physical, biological and socioeconomic) and, together with the community, developed technical and institutional options for sustainable natural resource management.

Given the emphasis on improving sustainability of marginal land in light of swift changes occurring in land use systems and socioeconomic environments, the fulfilment of the project’s objectives extended over eight
years. Innovative approaches both at the analytical and institutional levels, along with potential technological interventions, required testing and integration at the community level. The second phase of the project also aimed at a greater integration between socioeconomic and technical research outputs.

The discussion here is not designed to present the large number of outputs that emerged from the project. A comprehensive list of the publications that have been generated by the project is included in the bibliography section. Rather, this chapter describes the major outcomes with emphasis on what worked and what did not and why. The outcomes are organized into four major categories:

1. Innovative methodologies developed by the project in natural resource management that could be applied in semi-arid and arid settings
2. Livelihood improvements as related to the different research components that dealt with the sustainability of land use systems
3. The project’s impact in terms of broad policy influence, community capacity building and evolving research capacity
4. A new research framework adopted by the project for a better understanding of natural resource allocation

The first two categories of outcomes are presented in this chapter, while the last two will be detailed in the next chapter.

**Natural Resource Stories**

A number of research approaches were developed by the project that blended technological tools, such as the geographic information system (GIS), with community-based approaches, such as participatory research (hence the term participatory GIS, or PGIS). Three of these GIS tools which relied heavily on community participation will be presented to demonstrate the capabilities of the approaches as well as the possibilities and difficulties of promoting real local participation in the adoption of GIS. We call them natural resource stories, as some of the best insights on natural resource management are conveyed through these stories. The challenge is to distinguish significant stories and combine them with possible field methods to build a coherent body of shared knowledge.

GIS was ideal for the job we set out to do – developing options for the sustainable management of natural resources – as it is designed to support
the capture, management, manipulation, analysis, modelling and display of spatially referenced data for solving complex planning and management problems. It offers the speed, flexibility and power required to integrate large quantities of data. However, many of the team members expressed concerns that GIS would force the research away from the end users and back into the laboratory. Those among us involved in GIS-based research argued that the use of GIS is akin to using any modern tool and that it usually is the researcher, rather than the tool, who seeks the peace and quiet of the office. Thus, the decision to use GIS was adopted, with the proviso that it should involve the local community and that the benefits should be directly felt by the stakeholders. This constituted the basic definition of PGIS.

PGIS was used for three purposes: to develop a methodology for evaluating soil degradation, to study land uses, and to plan the locations for siting rainwater-harvesting reservoirs. Details of these methodologies have been published elsewhere (Zurayk et al. 2001a, 2001b; El Awar et al. 2000). Thus, they will be discussed here only in terms of what worked, what did not and why.

GIS-based methodology for soil degradation evaluation

Poor agricultural practices, overgrazing and deforestation over the past three millennia have resulted in widespread degradation of land resources in the drylands of MENA (Dregne 1992). Current global and regional economic developments are inducing further pressure on the land. There is a pressing need for action to mitigate land degradation. Land degradation results from the interaction of human activity, such as agriculture, with the biophysical and socioeconomic characters of a specific ecosystem. When studying large areas, it is necessary to distinguish zones where urgent intervention is required from those which are stable under the current land use system. Achieving this complex task requires (1) the selection of land quality indicators appropriate to the natural and socioeconomic environments, (2) the use of a flexible methodology that easily allows a number of permutations and “what if” scenarios, and (3) replicability and moderate cost.

GIS is ideal for this endeavour. However, the accuracy and relevance of the information produced by GIS are only as good as the data sets available. In developing countries such as Lebanon, especially in remote, marginal and poor areas, data is often non-existent.
Using the limited data available on Arsaal, which included soil maps, contour maps and a land cover map, soil degradation assessment maps were created based on three measurements: drainage density; drainage texture; and factorial scoring of the main soil degradation agents, which were slope, grazing and land use. The approaches adopted for the generation of the maps were based on extensive discussions with farmers and herders. The local perception was that the risk of degradation was low to medium, although this seemed counter-intuitive, considering the extent of aridity of the land. It was finally presumed that the main soil erosion risk in the mountainous areas of Arsaal would be, in theory, high rainfall intensity on steep slopes. However, annual rainfall is very limited and, although data from various ecozones is unavailable, local knowledge indicates that it is similar over the whole area, except in areas of high elevation where the precipitation is mostly snow. This would have little additional effect on soil erosion, thereby limiting the effect of the slope, except in two situations.

The first is in the case of severe, short-duration rainstorms, which produce severe rill and gully erosion. There is no data available on the intensity and duration of these storms, which appear to have a recurrence period of ten years. From local reports and observed erosion patterns, it appears that these events can be very damaging, which explains the severe gullying observed in the mountains and the size of the streams that cut across the otherwise desert-like Eastern zone. In order to account for the effects of storms, an indirect approach was selected. The impact of storm events on a specific area is indicated by the marks they leave on the land. The study of drainage density and drainage texture allowed us to obtain an indication of this effect.

The second is in the case of mechanical disturbance, such as that caused by keeping herds for prolonged periods within a limited area. This effect was accounted for by the development of a grazing pattern coverage analysis.

A combined soil degradation assessment map, integrating the data from the three assessments (drainage density and texture and factorial scoring of soil degradation agents), was produced and successfully field checked. The soil degradation level, or erosion risk, appeared less extreme than the landscape would indicate. The factorial soil degradation assessment resulted in the classification of over 90% of the area in the low and very low soil degradation categories. We speculated that, owing to the low-input agricultural practices, overgrazing was the major soil degradation agent on the land. This was confirmed by the finding that the moderate and high
soil degradation levels were present at locations where the animal stocking rate was highest, independent of the slope and land use. Our survey revealed, however, that grazing has become geographically very limited, as herd movement is declining with the availability of hand feeding. Moreover, as the herd size has been declining (from 90,000 to 60,000 over the past 40 years), this would have resulted in further alleviation of the impact of overgrazing. It is to be noted, however, that this situation may be only temporary. Indeed, stone fruit production in the orchards is starting a shift to a higher-input system, and this will increase degradation risk. The methodology developed can readily accommodate this change, and a new factorial map may be produced.

The combination of the three assessments, each representing a different soil degradation mechanism, is therefore expected to produce the most holistic perspective on soil degradation in Arsal. The drainage maps offer an insight into what has happened (past effects), while the factorial analysis map addresses the current status of the land. Most remarkable is the fact that our findings validated the indigenous perception of land degradation risk in the short and long term.
The approach required limited field measurements and yet provided reliable indications of soil degradation risk. It is technically possible to carry out generalized and semi-generalized land degradation hazard assessment with limited georeferenced data sets. Thus, the technique has the potential to be replicated in similar environmental regions if adapted to include site-specific parameters.

The adoption of a GIS-based procedure required a significant capital investment in material and human resources. However, even though the initial cost was relatively high, the investment proved to be sound as the digital data was available for multiple users, thus increasing the return on the initial investment. Moreover, the capacity of AUB in conducting interactive multidisciplinary research in natural resource management has been greatly improved.

Participatory GIS in land use investigations

Because of technical requirements, land evaluation has been traditionally carried out by planning authorities operating at the central government level and enforced through regulatory mechanisms. This top-down approach commonly results in poor adoption of the directive by the communities concerned (Moote and McClaran 1997). GIS technology is commonly used for this purpose (Hansen et al. 1998). Since the 1980s, non-traditional approaches based on the participation of stakeholders at every stage of the planning process have evolved and are now being proposed as a viable alternative for resource management (Pretty and Shah 1997). This participatory approach can be combined with modern technologies, such as GIS, to provide the “best of both worlds”. This combined approach, termed participatory assistance (Lanyon 1994), has been found to promote innovation in farming, research, education, and policy formulation. The implementation of land use studies in the poor drylands of MENA is also faced with the problem of data availability. The information base is poor, unreliable and often inappropriate for the modern land evaluation frameworks. There is therefore a pressing need for the development of an adapted framework for land use studies that is appropriate for data-poor environments and that lends itself readily to stakeholder participation. Rural communities often rely on some form of indigenous land resource evaluation in their traditional land management systems. The incorporation of indigenous evaluation has been advocated so as to improve the relevance of land surveys (Briggs et al. 1998).
It was hoped that the implementation of such an approach in Arsaal, where conflict over land use had emerged between pastoralists and fruit growers, would encourage the adoption of sustainable land management practices by establishing dialogue and partnership among stakeholders. The study aimed at carrying out a land capability classification and a land use analysis. Indigenous knowledge was used as one of the information sources for the land capability classification. GIS technology was used to produce a land capability map and to analyze current land use.

The indigenous agroecological zoning process in Arsaal is systematic and integrates climate and soil attributes. Three general areas (highlands, valleys and the steppe) are recognized and further divided into six agroecozones each with uniform climatic conditions determining the potentials and constraints for crops. Climatic data is inferred from the duration of the snow cover and the incidence of frost, which are used as indicators of temperature and moisture. Ecological indicators of local climate, such as the distribution of plant species, are also used for delineation. For instance, *Poterium spinosum* delineates the limits of the Western ecozone. Similarly, the occurrence of *Artemisa herba alba* delineates the Eastern steppe. The landscape division, which is clearly delineated, is commonly used and recognized by the entire community.

Several soil types may be distinguished in Arsaal. They are named by local farmers in relation to their location and categorized according to their agronomic potential following a multi-descriptor system. The system includes depth, colour, texture/water relations and other existing limitations. Farmers evaluate these descriptors during land preparation and planting operations. Soil depth is used as a main descriptor, as it has direct implications on crop yield and moisture reserve. Soil colour is second and locally believed to be related to soil fertility. Soil texture and water relations constitute the third descriptor. Thus, the local community relies on physical factors that can be observed visually. Based on the combination of indigenous soil knowledge and field surveys, a relatively detailed soil map was created in due time and with a limited budget.

The local perception of the causes of land degradation was investigated through a participatory approach in order to determine the relevance of the indicators of land capability. The farmers define land degradation as the reduction in the capacity of the land to produce the desirable biomass. For a farming community, this is synonymous with the loss of utility of the land and carries, therefore, an intrinsic economic dimension. The major determinants of land degradation as perceived by farmers were identified
and ranked. These determinants confirmed that the parameters used for land evaluation (slope, texture, effective depth and subsoil permeability) were adequate. It was also found that the main stress on land resources in Arsaal is soil erosion associated with land management practices in the stone fruit orchards, especially the lack of soil conservation measures on slopes that are sometimes steeper than 20 degrees, accompanied by tillage up and down the slope. When approached, the farmers acknowledged that this form of land use is inappropriate and realized the damage resulting from poor agricultural practices, but they proceeded to rationalize every decision taken. They justified the use of steep land for expansion as being the only land available. The absence of structural soil conservation measures, such as the traditional stone-walled terraces, was explained by the cost for their construction and maintenance. Tillage up and down the slope was also deemed necessary, as the tractors would otherwise overturn on the steep slopes.

The land capability framework and the thematic data maps were presented to farmers and used to respond to their queries on land use issues. For example, where could orchards expand with minimal risk of land degradation? The GIS analysis overlaying the land capability map, land cover map and agroecological map allowed the identification of these areas geographically. These areas were delineated on a large-scale map which was made available to the farmers via a series of workshops organized by LUN.

The farmers were also interested to know the geographic locations of the orchards that were established on land of the wrong capability classes. A digital coverage of the orchards was overlaid with the land capability map to delineate inappropriate land use areas. A field assessment confirmed 65% of the areas identified by GIS analysis. In nearly 35% of the remaining cases, however, the GIS analysis failed to identify good cultivable land because of the coarse resolution of the slope map. In these cases, the orchards were located on flat depressions that were protected from erosion by their location. These fields are more fertile as they receive run-off water and sediments from their micro-catchments.

Another question was whether grazing pressure was intensified by the reduction of effective grazing as a result of the expansion of orchards. An overlay of the land cover map and the grazing map indicated that most of the reduction in grazing areas mirrored the expansion of orchards. The total land available for grazing was reduced by nearly 30%. During that same period, Arsaali flocks had been reduced by 30%. It may be that the pastoralists had adapted to the changing land use by reducing flock numbers
to maintain a steady stocking rate. In this case, however, it is difficult to dissociate the impact of land use changes from other environmental or socioeconomic variables such as shrinking markets, feed availability and drought, all of which were taking place concurrently during the past 30 years.

The participatory approach to land studies is increasingly advocated as a critical step in the development of sustainable land management options (Van Ittersum et al. 1998). These options are built on compromises and on conflict avoidance and resolution. The approach has applied well to the situation in Arsal, where disagreement over land use is in part related to differences in the perception of what constitutes sustainable land use among settled farmers and pastoralists. By getting together and participating in the process, stakeholders have achieved a common perception of land as a multifunctional resource and have realized that any decision must be built on trade-offs. Nonetheless, a pertinent issue remains as to the usefulness of land use studies and their impact in situations where strategic thinking is overcome by day-to-day realities, as is the case in Arsaal. For instance, the project has helped identify land parcels, currently under annual cropping, on which orchard cultivation may be expanded. Although this shift may result in larger cash inflow in the short term, the long-term effects
on both the community and the land may be very damaging. Annual cropping, based on the tradition of legume–cereal rotation, is a sustainable, fertility-conserving and pest-limiting system, while orchards, practically a monoculture, require large external input. Such a shift would improve economic sustainability as perceived by the stakeholder while potentially endangering the ecological sustainability of the farming system.

Hydrospatial hierarchical method for siting water-harvesting reservoirs

Water shortage is the main limiting factor in dryland agriculture, the result of low annual rainfall depth and the non-uniform temporal and spatial distribution of rainfall. Water harvesting has been used since ancient times to supplement scarce water resources in dry areas. It has recently received renewed attention, with indigenous and traditional knowledge readily integrated (Samra et al. 1996). Site selection for small irrigation reservoirs is based on hydrological, topographical and socioeconomic considerations (Verma and Sharma 1990; Srivastava 1996).

Our project aimed at developing a new methodology for locating and ranking suitable sites for small water-harvesting reservoirs to make use of the rainfall which is mostly lost to evaporation and surface run-off. To begin with, a field survey was conducted in the project area to assess the socioeconomic feasibility of building small irrigation reservoirs in the Arsaal area for rainwater harvesting. A questionnaire was designed and distributed to a sample of 100 local farmers. The questionnaire was divided into four sections: personal data, inventories, acceptance of the idea, and willingness to contribute to the project. In addition, a field study was conducted to assess the feasibility of building water-harvesting reservoirs versus other means of finding new water resources for sustaining agriculture in the area.

The socioeconomic study revealed an overwhelming acceptance of water harvesting as a means of making new water resources available for agriculture in the area. Enthusiasm for the idea among local farmers was expressed by their willingness to contribute labour, machinery, land and any other resources at their disposal.

The method used was based on quantifying the overall suitability of a site for small water-harvesting reservoirs through a reservoir suitability index calculated for potential candidate sites. This index was developed
using hydrological modelling in conjunction with GIS and an analytical hierarchy process, which was used for quantitative assessment and ranking of alternatives. The resulting method, called hydrospatial analytical hierarchy process, excluded sites where reservoirs could not be built because of physical constraints and/or restrictive land use policies and regulations, and ranked the rest of the sites based on their respective index values.

All selection criteria and their weights were based on indigenous knowledge and expertise in the pilot area as well as on published literature. A participatory approach was applied to determine the criteria for site selection and to fine-tune threshold values used for site attribute classification. Exclusionary criteria for initial screening of potential reservoir sites were selected by farmers according to land use attributes in the study area. For instance, reservoirs should not be built in any existing stone fruit orchard, because diminishing the agricultural area in the region would defeat the purpose of the study. In other words, priority was given to current land use for stone fruit production over its potential for water harvesting. Furthermore, reservoirs were not to be located in any of the numerous quarries in the area to avoid deep seepage losses in fractured limestone areas. Non-exclusionary criteria, such as the proximity of a water
reservoir to stone fruit orchards and other agricultural lands, were also chosen by farmers. Obviously, the objective was to ensure the economic feasibility of reservoirs in the context of the low-input agriculture practised in Arsaal.

The application of the hydrospatial methodology showed that it worked efficiently for small water-harvesting reservoirs. Moreover, the method proved to be highly flexible when it came to selecting criteria for reservoir siting, as their attributes were developed according to indigenous knowledge and local expertise.

A standard methodology for selecting small irrigation reservoir sites in dry marginal land was now available to be broadly applied across similar regions in the Middle East. The main proposed change to the model was the consideration of long-term sub-basin water yield in the reservoir-siting procedure. Field testing of the initial results was the next logical step to be taken by building one or two reservoirs and monitoring precipitation, snowpack and run-off for two or three years to calibrate and refine the developed methodology.

In addition to serving as a tool to verify the developed methodology, building the reservoirs would have been a tangible output from this project for the local community in Arsaal that leads to direct benefits for the local farmers. Consequently, the community was consulted on the technical design to be adopted for the construction of the reservoir in light of existing traditional knowledge. Traditional cisterns lined with clay and gypsum and locally known as roman wells are commonly used for harvesting rainwater at individual orchard gates. Farmers were not receptive to the idea of using plastic to line the bottom of the reservoir. In their opinion, the prohibitive cost of the plastic lining would seriously limit the chance for adoption by the community at large. The local argument was well taken, and the indigenous option was adopted.

Several samples of local earth material were tested for prospective use in lining the reservoir. One sample with acceptable characteristics was selected for further field testing. Owing to financial constraints, only one reservoir was constructed, and the performance of the lining material was monitored. Sadly, the indigenous lining technique used for small earth-embedded cisterns was not the most appropriate one for larger, semi-oval open reservoirs. An unfortunate succession of severe droughts resulted in large cracks and significant leaks probably due to excessive evapo-transpiration and long exposure to sunlight and torrid heat. We had been
too carried away by the excitement of what appeared to be local domestication of the technique and lost sight of what could possibly go wrong. Moreover, what was considered by the project to be a minor technical setback was perceived by our local partners as a major failure for their partnership with the project. According to us, we were simply testing an innovative methodology for reservoir siting. But for them the promise of a tangible development output for the whole community was now in doubt.

Although the technical failure was linked to the inappropriateness of the local lining technique, we were basically taxed for our overzealous participatory approach. Or was it that the weighing up of old methods against new technologies seldom translates effortlessly into acceptance by local farmers? In his review of water research at the local level, Brooks (2002) concluded that small and simple approaches are more likely to be adopted and put to lasting use than grand designs which require significant investment.

As a matter of fact, efforts were directed to attracting development funds from a World Bank-supported integrated water management project to be
implemented by the Lebanese Ministry of Agriculture. The World Bank experts showed great interest in the application of the technique nationwide, and Arsaal was shortlisted as a potential site for project implementation. Suddenly, all the excitement subsided, and Arsaal “mysteriously” vanished from the short-list of potential sites. We were later informed by ministerial sources that Arsaal did not carry the political weight required.

**Improving Livelihoods**

Although the project maintained its focus on research, there was pressure from the community to generate tangible short-term development outcomes. Considerable efforts were devoted to involving development partners at different stages of the project’s implementation.

A classical farming systems approach was investigated to fully understand the components of the shift in resource use, identify the target groups, define constraints, and formulate technical options for intervention (Hamadeh et al. 1999). The emphasis was on assessing the sustainability of the agricultural land use systems, namely small ruminant production and rainfed fruit production.

One hundred farms were clustered based on criteria such as farm size, animal and crop production, and principal sources of income. The analysis revealed that cereal production is still practised by most of the farmers with a minimal contribution to their income. In contrast, fruit production is contributing substantially to income generation. Off-farm activities combined with fruit and cereal production and minimal livestock activities generated most of the income for 51% of farmers. For 35% of farmers, fruit production was the major contributor to income. Only 14% derived most of their income from small ruminant production.

A survey of 400 households revealed that the majority of farmers are small holders because of shortage of cash and lack of financing. Income from agriculture is becoming supplementary as more farmers engage in off-farm activities to fulfil their basic needs (Darwish et al. 2001). It was quite remarkable that the extensive survey covered 10% of all households in Arsaal. Needless to say, the involvement of ARDA and LUN made such a gigantic endeavour possible, and even pleasant. The project economist happened to be an Egyptian and was flabbergasted by the number of Gamal Abdul Nasser (Egyptian president who symbolized Arab nationalism) portraits in Arsaali homes.
Small ruminants under pressure

An assessment of the constraints in livestock production in Arsaal revealed four small ruminant subsystems ranging from semi-nomadic to settled with marked variations in resource use (Hamadeh et al. 1999). Analysis of feeding and management calendars indicated that hand feeding accounted for 30%–80% of the animal diet according to season, with most of the feed being purchased from the local market. In response to the shrinking grazing land (being converted to fruit production and quarrying uses) and therefore limited feed availability, the once traditional pastoral systems are declining and developing into more sedentary ones that are highly interlinked with the feed resources of high rainfall zones. Furthermore, a detailed bioeconomic analysis revealed that small ruminant systems are under severe pressure and in most cases show negative economic returns (Hamadeh et al. 2001). Feed expenses, when coupled with grazing costs, represent a major constraint on profitability. Nevertheless, farmers consider small ruminants to be a source of capital when cash is needed.

The assessment of range resources in Arsaal indicated very low productivity coupled with a major deficiency in forage legume seed banks irrespective of the ecozone. Severe overgrazing in localized grazing areas is suspected.

The farmers perceive the major constraints to small ruminant profitability to be poor animal performance, health problems, lack of veterinary service, low feed availability, and poor marketing of animal products, milk in particular.

Ripened fruits

In comparison to small ruminants, low-input production of fruit trees adapted to marginal environments has proved to be a more sustainable alternative with minor biological and management problems (Talhouk et al. 1996). One of the biggest problems is the cultivation of orchards on slopes without any form of structural barrier to soil erosion. This may not pose serious problems in the “normal” years of low rainfall, which explains the farmers’ lack of interest in investing in soil erosion prevention. However, this becomes catastrophic in the occurrence of storm events, which recur approximately once every 7–10 years. Some farmers have recognized this long-term issue and have invested in soil conservation. Lack of technical
knowledge and low capital availability also explain the little importance accorded to soil conservation. Soil investigations showed low soil fertility and low levels of organic matters, and further fertility decline is inevitable as little fertility improvement takes place. Indigenous technical knowledge adapted to the recently adopted tree-based farming system is lacking.

Economically, cherry and apricot production was found to be profitable compared to other traditional crops (Saliby 1998). Moreover, fruit production by far has been more profitable and less demanding in time and labour than small ruminant production. Cherry production in the higher jurds of Arsaal has a major advantage in that the fruits mature one month later than the national average maturity time. Unfortunately, this unique maturity time has not been capitalized by the farmers because of limited marketing opportunities and a poor transportation infrastructure. Instead, the value of the crop is similar to the national average price at the farm gate. In addition, the farming method is fully organic in most of the orchards, and this could be a selling point. This green approach is not due to awareness among the farmers but is mostly related to the remoteness of the village, which keeps chemical suppliers away. According to farmers, the sustainability of the low-input production system is limited by the lack of knowledge about cultural practices, low soil fertility, emerging pest problems and primitive marketing structures.

Scenarios

Based on socioeconomic data, an optimization model of marginal land use in Arsaal was developed within a sustainable framework, taking into consideration the resource constraints present in the area. The optimization model would be utilized to better allocate the productive resources (land, labour and capital) and to increase the revenue of small farm holdings (farms of less than five hectares). Results showed that capital is the most binding constraint in the area, and an increase in capital leads to a significant growth in net revenue. In addition, integrated crop–livestock systems were shown to offer more sustainable land use if supported by a sound credit system.

Another study was conducted to assess the competitiveness of agriculture in light of the expansion of quarrying activities and to predict whether both activities would still operate complementarily in the future or if quarrying would replace agriculture as the major economic activity (Geadah 1998). Different scenarios were considered for agricultural
activities based on farming intensity, land cost and family opportunity cost. Quarrying activities were defined as consisting of rock quarrying, gravel quarrying and brick making. Both rock quarrying and brick making activities were then subdivided into three different scenarios based on land ownership and rock input ownership (for brick making activities only).

External environmental and health costs related to quarrying activities were estimated and added to the total cost of such activities. Analysis and comparison of the different scenarios for the different activities indicated that financial returns from quarrying activities exceed those from intensive farming, even if environmental and health costs are taken into account, and that quarrying contributes much more than agriculture to the economy of the village. The high returns offered by quarrying lure villagers to the industry, especially when no other major income-generating alternatives exist in the village. If proper zoning for quarries is adopted, agriculture can still exist alongside quarrying, especially when we consider that the sector employs the largest portion of the population. The sector can be boosted and strengthened by combining traditional crops with fruit growing. Nevertheless, comparative analysis of the interaction of the various land use systems with the environment is needed to assess their long-term sustainability.

Follow-up agenda

A series of workshops were organized through LUN to explore possible interventions in light of the research results. Fruit growers requested training on optimal cultural practices, identifying main pest problems and plant diseases, formulating sustainable control measures, and improving marketing. With respect to soil fertility and erosion problems, farmers were advised to consider the possibility of intercropping a rapid-growing legume in cherry orchards to raise soil fertility. Some farmers, especially those who relied entirely on orchards, were not very receptive to this recommendation. They strongly believed that the legume would compete with the trees for moisture, thereby reducing tree vitality. Farmers with mixed operations (livestock and fruit trees), however, showed great interest and volunteered to conduct trials.

It was also agreed that a structural soil conservation approach be developed based on methods used by local Arsaali farmers, such as intercropping with dwarf wild almond hedges, leaving strips uncultivated and building stone bund contours.
Discussions with herders led to the following options for intervention: (1) to improve flock productivity and management, (2) to improve feed resources through intercropping and crop rotation, and (3) to explore the feasibility of a processing and marketing cooperative involving pastoral women.

Delivery

As follow-up, several training activities were conducted by LUN with the involvement of various project partners. For instance, a series of workshops targeting fruit growers were organized in cooperation with extension agents from ICARDA on proper cultural practices. Based on the demand from growers, a workshop on orchard establishment, covering pruning and grafting, was held. From this workshop, which involved field demonstrations, it was very clear that trees were poorly trained initially as many tended to have double trunks. In addition, pruning of bearing trees was inadequate. Despite the fact that Arsaal has become the largest cherry and apricot producing area in Lebanon, production of these fruits is a relatively new practice in Arsaal and its farmers’ knowledge of the required
cultural practices is limited. Improper training and pruning of trees will eventually decrease tree productivity and in some cases lead to decline.

In addition, an insect monitoring campaign was successfully conducted with the active cooperation of farmers. Pests and their natural enemies were identified, and integrated pest management techniques were introduced to farmers. Farmers discovered that many of the insect species considered by them as beneficial to cereal production were very harmful to fruit production.

Several interventions were introduced by the project and its LUN partners (ICARDA and the Mashreq–Maghreb project) to develop integrated crop–livestock activities with the aim of improving the sustainability of the two major farming systems. A promising intervention consists of growing forage legumes under orchard trees as fodder and at the same time as a green manure.

Intercropping with forage legumes such as vetch and lathyrus species results in satisfactory yields to provide feed for small ruminants while improving soil fertility. It was hoped that, once adopted by farmers, the intercropping technique would enhance the integration of the animal–orchard system and would produce socioeconomic benefits. The initial resistance of the farmers was quickly overcome by the positive results and the low input required for the implementation. Except for the seeds which
were provided by the project, the technique could be integrated into the regular production cycle followed by the farmers at no extra cost.

The adoption rate of the technique doubled on a yearly basis but was limited by seed availability, as few farmers were able to produce their own seeds. The project called on the intervention of a development project (on combating desertification in Lebanon) implemented by the Ministry of Agriculture and supported and executed by the German GTZ. GTZ agreed to support the herders’ cooperative in establishing irrigated plots for forage seed production. The cooperative was requested, in return, to develop its own scheme for seed production in order to improve the sustainability of the intercropping system.

Other field trials initiated by the sub-network concerned with integrated crop–livestock systems with the cooperation of various research and development partners (ICARDA, LARI, IFAD and UNDP) in addition to the local cooperative were less successful owing to overwhelming limitations. For example, pre-sowing legumes into barley fields gave very promising results to start with (four times the yield usually reported by farmers), but very poor yields followed as a result of a succession of drought years. Various attempts at range rehabilitation (reseeding with negative legumes, planting of fodder shrubs) were partial failures because of the lack of range protection, high establishment cost or both.

The cooperative

It is worth mentioning that the local herders’ cooperative, which was newly established, was instrumental in facilitating technology transfer to farmers as well as in executing mini development projects as incentives to stimulate local commitment to research efforts. Members of the cooperative trained on new techniques would in turn disseminate the techniques to non-members via farmer-to-farmer training and farmer-designed trials. A good example of this successful approach was the introduction of an integrated management package to improve flock productivity and reduce flock size (Tami 2002). The package was developed with the active participation of cooperative members and consisted of (1) a preventive health programme to cut down on medication expenses, (2) a feed optimization process based on least cost analysis and animal nutrient requirements during the critical months of late pregnancy and early lactation, and (3) a basic selection procedure for culling unproductive animals. The idea was to show farmers that an integrated approach to flock
productivity is critical to achieving positive outcomes. The sale of culled animals would cover the extra expenses, if any, required to improve nutrition. The project drew on the resources of the IFAD and Mashreq–Maghreb projects, which provided funds for the preventive health programme. Initial on-farm trials were conducted by members of the cooperative, who agreed to cover part of the expenses. Results obtained were very encouraging and clearly indicated economic feasibility. The cooperative, energized by the good news, developed a creative mechanism to encourage herders to adopt the package. The hardest part was to convince them to practise basic culling and to reduce their animal numbers. Traditionally, herders keep extra unproductive animals to counteract the risk of unexpected mortality due to harsh climate or disease. The cooperative proposed not only to buy the culled animals but also to provide a cheap feed incentive for each animal culled. The sustainable approach, which was inspired by traditional practices, turned out to be highly successful at convincing herders to adopt the technical package as well as attracting new members to the cooperative.

“We feel proud once again. We can help other herders in the true tradition of pastoralism. We are recovering from years of despair and isolation. We can work together and trust each other as we used to do in the past,” claimed Abu Waleed, the cooperative president.

A pilot range rehabilitation trial was also conducted by the herders’ cooperative with the financial assistance of GTZ within the framework of one of its ongoing projects. The objective of the trial was to show the benefit of range protection and rehabilitation as a means of combating desertification. The local community would then be motivated to take over, replicate and sustain the process. GTZ assisted the process by supporting the establishment of a pilot trial. An area of at least five hectares was protected by the local cooperative and planted with Atriplex edible shrubs produced in a locally established nursery also managed by the cooperative. Again, the commitment of the cooperative to protecting the plantation proved instrumental in helping the trial succeed. Other range rehabilitation trials, conducted prior to the creation of the cooperative, fell flat because of the lack of protection on unregulated open access common land. This clearly demonstrates the important role of the cooperative in advocating and accepting change.

The lack of market accessibility and credit facilities has been identified as major obstacles to the economic sustainability of the farming systems in Arsaal (Darwish et al. 2001). A market survey was developed to estimate
the demand for Arsaali products. It covered the relevant markets and provided information on prices and market structure, potential and limitations. Based upon the market potential of Arsaali products, processes and frameworks were designed to improve the effectiveness of marketing and supply cooperatives for fresh and processed agricultural and artisanal products. Participatory workshops were conducted to expose farmers and especially women to the different structures and functional forms of such cooperatives and their potential benefits. Cost/benefit analyses were conducted for various products, such as homemade jam, dried fruit and dairy products.

In addition to the improvement in the sustainability of the farming systems in Arsaal and the resulting improved livelihoods, the project carried out a variety of studies ranging from research on biodiversity resources in Arsaal to nutritional assessment of children. These studies stemmed from the project objectives and developed into full-blown studies driven by either researcher interest (for biodiversity) or community demand (for nutritional assessment). For instance, a survey of plant diversity indicated the presence of many rare native fruit species, including wild almonds, wild pears and wild pistachios. The results attracted a regional project on agrobiodiversity to Arsaal. A nursery for these native species was established by LUN, and efforts are now being concentrated on the in situ conservation of these species.

Cactus Technology Transfer

El Harid tosses and turns in his sleep; he is having a bad dream. An awful thing has happened. A disaster!

An unbelievable spectacle of hillsides covered with succulent, shiny, smooth, newly sprouted cacti. Their shiny, smooth surfaces glisten and shimmer in the early morning sunshine. And, worse still, everyone wants them. El Harid tries to shut his ears to the “ooooohs” and “aaaaahs” of farmers. In a jiffy, it seems, most have already been harvested.

El Harid’s head droops. He must face up to it: spikes are a defect. He’s defunct.

Wait a minute! Where’s that magazine that fluttered by last week. Hey, look at this!
INSTANT MIRACLE CREAM
HAIR-GONE
DON’T WASTE TIME WITH OLD-FASHIONED REMEDIES
HAIR-GONE
THE RESULTS YOU WANT QUICK AND FAST

A week later, El Harid tries out the newly delivered jar of hair remover cream.

New technology is the best! Can’t wait to show off my shiny SMOOTH skin . . . Ouch! What’s that? . . . Yuk! Spots! Lots of them.

Poor El Harid spends the rest of the day crouching in the shadows, trying to hide his unsightly blotchy rash.
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It’s a perfect spring morning in Ottawa. One of those mornings when everyone has a spring in their step and a smile for the world. Birds are singing. A light breeze causes blossoms to fall gently like snow past the writer’s open window. Shadi Hamadeh is trying to write again, but he’s uncomfortable, shifting in his chair and puffing on one cigarette after another. He’s staring at a white page, empty save for the title: “Policy Influence”. He lets out a long, despairing sigh.

“Now what’s that for?” comes a voice from the corner of the room. And there sits El Harid, legs up, arms behind his head, bathing in the April/May sunshine. Shadi looks around, “You again!”, and at the same time is struck by a new look on El Harid’s face. “It’s been a long time since I saw you around here.”

“I’ve been extremely busy!” exclaims El Harid, his face glowing with excitement. “It’s that project in Arsaal. Things are really happening. I’m running a farmers’ cooperative now, as well as attending LUN meetings. There’s so much to do, so many people want to see me; the local community are very pleased with the changes. Did you hear that I’m thinking of standing in the next municipal elections?”

“Well . . . that’s great. Good luck!” ventures Shadi, a little surprised. He stares at the empty page.

Is change possible anymore at a time when irrationality rules the world? What on earth can El Harid achieve at a local level when the “good versus evil” political madness pervades the world? But it seems that things are happening in Arsaal; the local community are pleased with the changes. I guess change has to come from within to be truly effective, even if it is like drops in the ocean. Look at me! It took ten years working on this project, but I’ve changed too! I’m much more sensitive to development
issues now; even when I teach I’m more focused on community
development. Well, that’s impact! Shadi crosses out the title and replaces
it with “Unexpected Fruits”. And he begins to write.

**Policy Influence**

A strategic evaluation of the project for policy influence performed by
IDRC found that, though partially unintended, the Arsaal project made
broad policy impacts in three directions: upward to national institutions,
horizontally to researchers and research institutions, and downward to local
people and local institutions (Brooks 2002). Ranked by the extent of
influence, the order, from most to least, would be horizontal, downward
and upward.

At the local level, the project promoted various forms of capacity
building. According to the project’s rural sociologist, the project shifted
from developing technologies to developing communities. The great legacy
that the project will leave behind is institutional.

**Capacity building for the community**

The interactive process helped ARDA, among other local players, to
develop its capacity as a partner in research and development. Members
were trained to conduct the various surveys and appraisals needed in the
project. Network members were trained in participatory research
methodologies such as participatory rural appraisal and farming systems
analysis. They were actively involved in research, surveys and on-farm
trials. Through this capacity-building process, ARDA built itself into a
local incubator for the two cooperatives that were established and provided
them with space as well as logistics and technical support. Moreover, it
acquired a national reputation via its active involvement in many national
networks. Its regional moment of fame came through its exposure to the
Mashreq–Maghreb project coordinated by ICARDA.

The project facilitated the establishment of two cooperatives, one for herders
and another for women involved in food processing and handicrafts production.
The cooperatives provided the institutional frameworks needed to translate
research findings into economic development and sociopolitical empowerment.

Women and herders are marginal groups in society. Their participation
in cooperatives gives them the framework to communicate with decision
makers and a channel through which to express their needs and to work on
satisfying these needs. Today, only a few years after it was founded, the herders’ cooperative has become independent from the project and is extremely active in development issues. For instance, it is participating in nationwide initiatives such as the National Action Programme for Combating Desertification.

The Herders’ Coop

A number of research actions and small interventions in support of pastoralists were first conducted by the Arsaal project. These activities subsequently attracted a number of new partners, resulting in the development of a larger range of activities and a wider beneficiary coverage. This encouraged members of the pastoralist community to work together more closely and to form a new cooperative in May 2000. The cooperative was formed with 15 founding members, who were later joined by 30 new members. Being the first such organization to be established in Lebanon, the cooperative for herders acquired the nickname “Republic of Shepherds”.

Structure
The administrative board is composed of 5 male members, including the chairperson, vice-chairperson and secretary. There are also a monitoring committee of 3 members and a general assembly of 45 members.

Impact
Relations with other pastoralists are growing steadily. The number of members has steadily increased and that of beneficiaries now represents half of the total number of flock owners.

Gender representation
All members of this cooperative are men. Traditionally, the role of women in this important economic activity has been complementary and traditional. Pastoralists are generally more conservative than farmers and less likely to involve their women in public forums.
ARDA was set up in 1986 and received official government notification in 1990. For several years, the new association received financial and technical assistance from the British aid agency Oxfam. From the early 1990s, its work was focused on four main axes: (1) training and job creation; (2) development of local agricultural resources; (3) youth and environmental activities; and (4) women’s economic and social participation. During the course of its work, ARDA developed a range of projects and activities in partnership with several foreign and local, private as well as public, development organizations. It played a pivotal and leading role in development action and debate in Arsaal until 1998. In that year, the first municipal elections in the country since 1964 were held. ARDA was instrumental in the setting up of two cooperatives: the women’s cooperative and the pastoralists’ cooperative. ARDA operates from a large centre, which it built with generous donations and completed in 1997. The centre includes a large and well-equipped general meeting room, three administrative rooms and two storerooms. The activities of the pastoralists’ and women’s cooperatives are hosted within these same premises. In terms of equipment and office furniture, ARDA is relatively well equipped with three personal computers, a photocopier, as well as email and fax facilities. Furthermore, the association operates two vehicles: a four-wheel-drive vehicle for trips into the highlands and another for transportation inside Arsaal and the rest of the country.

Structure

The association is constituted from a general assembly with a total membership of 60 persons, of whom 30 are women. It is run by an

The institutional capacity building promoted a more democratic approach to decision making, in sharp contrast to the centralized approach to both research and political decision making in Lebanon. At the national level, community-based resource management, almost unknown in Lebanon prior to the project, became a model for LARI and other government agencies. The Arsaal model was copied, and several herders’ cooperatives have been established in the Bekaa and elsewhere.
administrative board of 9 members, including 2 women. Furthermore, ARDA benefits from the support of a significant pool of volunteers, some of whom are members of the association, while others are drawn from the community.

**Impact**

ARDA played a key role during the 1998 municipal elections through its support of a consensus list of candidates, which included one of ARDA’s key members. Following the elections, an ARDA member held the post of municipal head for the first three years of the municipality’s mandate before passing it to a rival member of the municipality as part of a deal agreed following his election success.

Generally, through its increasingly inclusive efforts in community development as well as its open and highly transparent policies and practices, the association has succeeded in establishing itself as a key local player in the community and in overcoming an earlier blockade by certain local circles.

**Gender representation**

The association recognizes that there is still much to be done with regard to its programmes and in terms of gender development, despite its continuing efforts to improve the position and role of women in the association. Generally, there is a feeling that women are well represented in ARDA activities both as beneficiaries and as volunteers in project implementation.

As to their role in decision making, 2 women are members of the executive board and 30 are part of the general assembly. However, women’s actual participation in decision-making processes within the association remains very much limited.

The herders’ cooperative in Arsaal felt strong enough to make a representation to the national government. It has been lobbying the department of extension for the establishment of an extension unit in Arsaal to no avail, as decisions are usually taken at the highest government level, and Arsaal remains isolated and marginal with poor political representation in the government.
Decision making in Lebanon is confined to the higher echelons of governmental institutions, who communicate very poorly with their technical and field personnel represented in LUN. To overcome this problem, the network initiated tools specifically targeted at actual decision makers, such as newsletters, websites, conferences, seminars and launches where decision makers were invited as keynote speakers. These initiatives have produced tangible outputs, such as freezing the implementation of a quarrying plan in Arsaal, which would have eaten up parts of the mountains and was highly controversial within the community. Moreover, they have pushed dryland development issues on government agendas.

One indirect impact of the project is that many of the graduate students involved in it afterwards joined various government and development agencies. Moreover, one of the authors of this book (Zurayk) has been recently appointed advisor to the Lebanese Minister of Agriculture and is actively involved in the development of an integrated agricultural policy at the national level.

The most visible policy influence occurred at the level of the municipality. Several members of LUN became members of the Arsaal municipality, which is the local decision-making body. Moreover, one member of ARDA became the first municipal president at the first municipal elections conducted after the conflict in Lebanon ceased. All this has helped raise awareness of natural resource management issues.

Evolving research and development capacity

The influence of the project on researchers and donors was remarkable. The project was quoted by many to have become the test case for using research to stimulate development in rural areas. It was one of the first post-war projects at AUB to link research objectives and the research method to community development. The project’s influence culminated with the creation of the Environment and Sustainable Development Unit (ESDU).

There was a need to consolidate various research activities on natural resource management and sustainable livelihoods at AUB into a semi-structured unit. The existence of such a unit would greatly improve the capacity of the recipient institution to streamline, manage and implement multidisciplinary research projects. In addition, such a unit would act as a focal point for seeking funding, coordinating projects and integrating research themes across disciplines. It would also provide greater support to the flow of information among scientists of different disciplines by
creating linkages and networks and preparing documents and reports. Lastly, the unit would ensure the sustainability of project activities by developing mechanisms for the continuation of specific activities and for assessing long-term impacts beyond the lifetime of projects.

IDRC coordinated a visit by the project leader to major Canadian interdisciplinary research centres to explore working models for the

Environment and Sustainable Development Unit (ESDU)

Mission
ESDU acts as a specialized unit for the promotion of sustainable rural livelihoods in drylands. It seeks to break away from the traditional compartmentalization of research and to put current understanding of the research community in the hands of the user and policy-maker communities. It adopts a multidisciplinary, participatory approach, which helps to ensure that research is grounded in the needs of local people. The unit serves as a regional interdisciplinary research centre, provides training, services and consultancy, and hosts large community development projects. These projects respond to special needs or opportunities that fall outside the conventional research frameworks of individual disciplines.

Goals
ESDU’s goals include the following:

- To act as a strong regional focus for development research
- To establish linkages and strategic partnerships with the public and private sectors, international organizations and community stakeholders for conducting joint research activities
- To network with national, regional and international research centres and institutes for the promotion of sustainable livelihoods
- To serve as a leading training centre in the region providing training at all levels in the areas of natural resource management and sustainable development
establishment of such a unit. Then a proposal was submitted in a truly “bottom-up” approach and positively received by the AUB administration. ESDU became functional in 2001 under the umbrella of the Faculty of Agricultural and Food Sciences.

The young ESDU is already making its mark as a national and, more importantly, a regional player, delivering research, education and training as well as outreach. Among its achievements is a community development initiative launched to foster partnerships between communities and development actors, including policy makers, donors, the private sector, community-based organizations and NGOs. It has also launched a capacity building network for community development to bring together scientists, policy makers, development actors and donors in an effort to formulate integrated research and development strategies for Lebanon. This project was conceived in view of the fact that, although many development initiatives by local and international actors exist in Lebanon, there is little coordination, limited synergism, and minimal attention given to value adding through collaborative actions. There is a lack of replicability, little attention to cumulative experience, and minimal sharing of what works and what does not. Moreover, the making of decisions and the formulation of policies seldom draw on the full range of relevant knowledge, critical resources and overall capabilities.

Under the umbrella of this capacity building network, a specialized platform for natural resource management was initiated. The objective of the natural resources platform is to bring players currently active in natural resource management together in joint research and development activities. It was agreed Arsaal would be a pilot site for joint efforts to promote sustainable village-based development. The platform also facilitated the development of a local development agenda that was jointly agreed by all user groups in the community: the municipality, NGOs, cooperatives and sectoral representatives. Donors and policy makers also agreed to coordinate their efforts through the platform to deal with issues in the agenda. Several interventions are now being implemented, one of which focuses on assisting the local municipality in land use planning and land zoning for grazing and quarrying activities. Moreover, support is provided to the municipality to help it to initiate negotiations with the various user groups (fruit growers, herders and quarry operators) to reach a jointly agreed management plan for the land and to work with the quarrying sector in particular on site rehabilitation as well as waste and water management.
ESDU’s Sustainable Livelihoods in Drylands Community of Practice was one of the winners of the Mediterranean Development Forum’s Communities of Practice Competition. The Mediterranean Development Forum partnership, begun in 1997, comprises think tanks from the MENA region, UNDP, and the World Bank Institute. It is dedicated to empowering civil society to participate in shaping public policy, contributing to the policy debate in key areas of regional interest, improving the extent and quality of research on economic and social policy issues, and creating vibrant networks of development actors in the region. The forum supports communities of practice with the aim of enhancing the opportunity for development practitioners to exchange experiences, solve problems together and learn from each other on a regional level. It is also expected that the activities of each community will have an impact on policy dialogue and policy making in the region.

ESDU established a community of practice to provide the needed enabling framework to ensure continuity in discussions and information exchange for the promotion of sustainable livelihoods and human development in drylands. The community comprises research and development practitioners in MENA.

ESDU is also making an impact on curriculum development at AUB’s Faculty of Agricultural and Food Sciences (FAFS). According to the faculty’s dean, Dr Nuhad Daghir, FAFS has been integrating the concepts of sustainability in its undergraduate programmes as well as in graduate studies, research and services. More emphasis is being placed on environmental preservation and protection and on the social and cultural aspects of farming life. ESDU is deeply involved in development projects targeting the poor and aiming at supporting rural livelihoods. These projects have become the national and regional reference in the implementation of organic farming practices for enhancing the livelihoods of small farmers. This field experience is being integrated into FAFS’s academic programmes. Its production courses now emphasize practices that are not only sustainable but also environmentally responsible and economically viable. Senior-level courses are now more interdisciplinary and cut across several areas of specialization. Students are trained to work with farmers, as this is a key factor for success in community development.

Furthermore, AUB has introduced an interfaculty master’s programme in environmental sciences which involves all the university’s faculties. In FAFS, the emphasis of this programme has been on ecosystem management,
which focuses on the interaction of physical and biological resources and the agricultural and social sciences as they relate to the utilization and development of ecosystems. Graduates learn how to formulate strategies and implement solutions to keep the ecosystem productive, biologically diverse and sustainable.

Dr Daghir pointed out that agricultural curricula need to be dynamic because there are always new issues that agriculturists have to deal with. Problems such as environmental degradation, animal welfare, consumer demands and their health needs, genetically modified organisms, trade and subsidies are all expanding issues that need to be addressed.

Ladies night: the empowerment of women

The project assigned considerable weight to social and gender analysis. Aside from a socioeconomic component, a qualitative component was included through an ethnographic study. The aim of the study was to assess the effects of rapid social changes in Arsal on the household. It also aimed to investigate gender-based division of labour, the time allocation for different activities of men and women, as well as the needs and possibilities of income-generating projects for women in particular. The idea was to find locally acceptable sources of income, bearing in mind the novelty of a female “job market” in Arsal. The research approach adopted was to have the researcher reside in the village for prolonged periods. The benefit of this approach is that she became the project’s facilitator and link at the local level, connecting the local and outside stakeholders.

In order to better evaluate the time availability of women to undertake supplementary income-generating activities, an intensive field study was conducted by the resident anthropology student with emphasis on women’s value system, economic conditions and legal status in relation to family production and land rights (Obeid 1998). Beyond this, the anthropologist in training was given the opportunity to visit other NGO projects in Lebanon that aimed to improve local women’s economic status and eventually to make specific suggestions in light of her research. Additionally, and in light of the results of these investigations, potential off-farm income-generating activities which could be undertaken in the area were defined in terms of organizational, training and other requirements for their implementation.

Data was collected through participant observations in agricultural activities and cultural rituals and through intensive ethnographic interviewing.
The general trend observed is that gender roles are susceptible to change and that gender categories are not as rigid as one would suppose in a traditional society. Women in Arsaal conform diversely to the traditional gender roles. They cope, mould or rearrange the restrictive structure made of cultural norms and expectations.

The study also attempted to glance at how men view the gender roles. Although many view the traditional roles as ideal, one can detect that men, too, realize that, in response to the new emerging needs, the boundaries between gender roles are shifting.

An important view articulated by Arsaalis, as is evident from the following remark, relates to majhoud (effort): “If one does not work, it is as if she is not living. God made us to work and struggle and get tired, not only to eat and sleep. Animals eat and sleep. If I sit at home doing nothing, I will not know anything. But when I work and mix with people who are cultured and educated, I will be enlightened. One is depressed when one stagnates, but I am very happy when I work. I would be more depressed when I run out of money. Then I would have to go to my nephew and ask him for pocket money. Instead, I will work, make a physical effort but find myself psychologically relaxed” (Amal, school janitress).

Arsaalis express an ideal dichotomy between men and women: “The mother is umm el dunya [mother of the world]. She is in charge of the children, their pain, their illness, their food. She is in charge of everything. She is more responsible than anyone else at home. The father provides, the mother raises” (Ibtissam, carpet weaver). However, practically, whereas “homemaker” entails procreation and nurturing of children, agricultural work and tending domestic animals, this conception is elastic enough to include women who cannot give birth, women who do not perform agricultural work and even women who are not married but are economically productive. “Homemaker” goes through a cycle along with women’s life cycle. Although the division of labour between men and women in a household is normative, the concept of homemaker already entails the idea that a woman has to put majhoud into building a home and that by doing this she earns respect as an individual.

The majhoud ethic and the ideology of sharing within a family coupled with rising economic needs have pushed women in Arsaal towards developing avenues for production by mobilizing available local resources in order to generate income. It is remarkable, for instance, how certain domestic activities are adapted to the cash economy. Women form “production units” to weave carpets and sell them on demand. A similar
process takes place with the selling of food usually prepared for domestic consumption to outsiders – individuals as well as organizations. These activities are of considerable importance in the sense of women’s endeavours to jump-start a culturally acceptable market for women.

One can infer that the community of Arsaal is undergoing many changes at the level of the gender system. In a transitional society where the community is still striving for a permanent, guaranteed system of production, the community is experimenting by responding differently to those changes. It is selecting indigenous traditions and opting for local innovations that are functional in the absence of government control and supervision. As men experiment with the various options available (agriculture, agropastoralism, military employment or quarrying), women are endeavouring to expand activities that were traditionally part and parcel of their domestic duties into economic activities, such as producing extra homemade food to sell through individual contacts to people outside the village. Another manifest attempt to respond to economic pressures is the evolution of carpet weaving from a domestic activity to a productive, economic activity bound by the factors and forces of the market.

The feasibility of creating women’s cooperatives in an attempt to integrate more women into a stable process of income generation was discussed by LUN, and ARDA was requested to outline a proposal for establishing such a cooperative. The major objectives behind such a project were to find a steady job market for women, to promote local agricultural products and, ultimately, to jump-start an economic cycle in the village and contribute to the improvement of livelihoods. A financial feasibility study of such a cooperative with a pilot-scale processing plant was completed by the project, and it indicated financial feasibility and significant economical and social benefits.

The women’s cooperative saw the light in 1999. Today, it manages two income-generating facilities: a carpet/rug weaving facility and a food processing facility. These started as small-scale projects which added value to the outputs of the other production systems (wool and milk from herders and cherries and apricots from fruit growers). Through LUN, the women were able to express their training needs. A designer recruited by the project conducted several workshops on carpet and rug design. Several training workshops were organized on food processing and packaging. Through the United Nations Development Fund for Women (UNIFEM), training was also offered in entrepreneurship and accounting. LUN also helped in exposing the cooperative to potential marketing outlets and linking it up
with a rural credit scheme run by the Ministry of Agriculture and supported by IFAD. The output of the facilities greatly increased, and more than 40 women have been regularly involved in the manufacturing processes and derive significant income from them. Moreover, key members of the cooperative are hired to offer training to women’s groups in other villages in Lebanon. Today, several years after its creation, the cooperative has yet to refine its financial system and sales strategy. Nevertheless, it is perceived as a successful Endeavour by its members and by the general community.

### The Women's Coop

In June 1999, a women's cooperative was established with 19 members, of whom 5 were men. The core group was formed from women close to ARDA as well as some members of the association. Another 8 women later joined in, thus raising the total membership to 27 (22 women and 5 men).

#### Impact

The cooperative maintains strong ties with ARDA, which has supported the cooperative since its establishment. However, the cooperative's relationship with its potential constituency, namely the women of Arsaal, remains limited to its direct beneficiaries. The limited size of its initial capital, as well as a narrow marketing outlet, makes further expansion to new beneficiaries very difficult in the near future. The cooperative, however, has succeeded in developing links with similar cooperatives, joining forces to put pressure on the authorities and to better serve their respective constituencies.

#### Gender representation

Although the cooperative is intended as an organization for women, and has indeed a majority of women membership, most of the decision making is in the hands of men.

Literature shows that cooperatives have played a proactive role in empowering women. This is particularly so since women normally are not well represented in the political and economic arenas and bear a lower
status than men. In addition, cooperatives help women to organize themselves, and this increases their self-confidence and enhances the opportunity for learning, for sharing experiences as well as for prioritizing their needs and, more importantly, expressing them. Moreover, cooperatives pool resources for production, thereby opening up more market opportunities and enabling more income to be generated. They also increase access to social services and decrease isolation, as well as enabling their members to build technical and management skills.

A New Research Direction

Already in phase I the project was innovative in its approaches: a farming systems approach was adopted to identify and cluster target groups. Research followed, focusing on studying farming practices, economic feasibility and repercussions principally on the natural resource base. Participatory approaches were used and materialized in the establishment of LUN. A series of awareness-raising, capacity-building and technology-transfer initiatives were started to help the people better manage their resources. Recognizing the importance of institutions in natural resource management, institutional capacity building was a major objective of phase I and resulted in the establishment of two cooperatives.

In phase II, emphasis shifted more towards putting people at the centre of the development research process and the generation of a comprehensive framework for analysis and interventions. A tortuous journey began to sift and test through concepts and approaches. Livelihood approaches (which date back to the work of Robert Chambers in the mid-1980s) appeared as a step in the right direction. They were initially conceived to help understand and analyze the livelihoods of the poor and to design and assess poverty alleviation and development efforts. They are increasingly used today by a number of development agencies, such as IFAD, UNDP and the World Bank.

The word *livelihood* can be used in many different ways. A definition coined by Chambers and Conway (1992) captures the broad notion of livelihoods as understood here: “A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.”
Putting people at the centre of development

Livelihood approaches view the poor as operating in a context of vulnerability. Within this context, they have access to certain assets. These assets gain their meaning and value through the prevailing social, institutional and organizational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood goals.

The livelihood approach differs from other approaches in its central focus on people’s lives rather than resources or defined project outputs. It aims to promote development that is sustainable not just ecologically but also institutionally, socially and economically and to produce genuinely positive livelihood outcomes: poverty reduction, improved well-being, reduced vulnerability, increased food security and a more sustainable use of natural resources.

Following this journey, phase II of the Arsaal project witnessed a shift in focus. The sustainable management of natural resources was no more the centre of the investigation or the objective of the exercise. The question was no longer how people should behave to make their management of natural resources more sustainable. Instead, the goal was to understand how people construct their lives and to understand the context in which they operate, the structures and processes which influence their decisions, the strategies they adopt and the goals they pursue in order to define the interventions needed to provide an enabling environment for the building of sustainable livelihoods, including the sustainable management of natural resources.

In phase II, livelihood approaches were applied at four levels:

- Shifting the focus from different sectoral perspectives (economics, crop production, livestock production) to a central focus on people’s livelihoods
- Developing an understanding of the driving forces, and the structures and processes, which shape livelihood strategies
- Developing a more detailed analysis of livelihood strategies and their evolution with time
- Analyzing linkages between livelihood strategies and natural resource management
Within the framework of a PhD thesis on the theme of “Livelihood Strategies and Natural Resource Management: Stories of Land and People”, a livelihood review of a sample of 100 agricultural families was conducted. The sample selection was from field to family: fields were first selected in the different agricultural zones of Arsaal, and related families were then identified with the help of the local community. The objective was twofold: (1) to develop an understanding of livelihood strategies and their evolution in response to changes in the vulnerability context and (2) to explore the interaction between livelihood strategies and land use management strategies. Technical information generated during phase I of the project from economic, ecological, social science and policy analyses was fed into the process. This integration allowed us to learn more about the driving forces, the strategies adopted and how these influenced natural resource management.

Livelihood strategies

One of the main outcomes of the livelihood review was to highlight the importance of diversification as a livelihood strategy adopted by the majority of the families interviewed. Ellis (1998) defines livelihood diversification as “the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living”. Livelihood diversification is not synonymous with income diversification. Nevertheless, many, but not all, economic studies of diversification focus on different income sources and their relationship to income levels, income distribution, assets, farm output and other variables (e.g., Reardon et al. 1992; Adams and He 1995). The term *income diversity* refers to the composition of household incomes at a given instant in time; *diversification*, on the other hand, implies that it is an active social process whereby households are observed to engage in increasingly intricate portfolios of activities over time.

The review found that stagnation in agriculture first triggered diversification into non-farm activities. Then the revenues generated were invested back in agricultural intensification and fruit tree production. These findings contradict the rural growth linkage model, which originated in the mid-1970s and has been the dominant paradigm concerning the dominant relationship of farm to non-farm rural activities. Its central tenet is that growth in agriculture itself provides the stimulus for the growth of rural non-farm activities in developing countries (Mellor 1976; Haggblade et al. 1989). In the model, farm growth is always seen as the cause of non-farm activities and not the
other way round. This helps explain the emphasis on technological change in agriculture in much writing on rural development in the 1980s.

This discordance with the rural growth linkage model may reflect the distinct temporal and spatial contexts to which it was applied. The growth linkage approach is associated with the period in Asia when green revolution technologies were helping farmers to achieve unprecedented increases in yield and output for the food grains, rice and wheat. The drylands of MENA have been unable to reproduce anything like the farm growth of that era in Asia, nor are they likely to do so given that their climate, cropping systems and soils are more fragile and risk-prone than the Asian case.

The analysis of the context in which the people operate and how it influences the strategies which are adopted is critical. Major driving forces in the context were identified and analyzed (namely, trends and obstacles in the political, economic, demographic, ecological and technological realms), in addition to an in-depth analysis of the institutional and policy environment from the local to the national level. The seasonality of production and work opportunities was also identified as a major determinant of livelihood strategies and land use options.

The context was seen as dynamic, redrawing the limits of the possible at each time point. The Arsaali people were responsive to changes in their context and creative in their adaptation strategies. They migrated to urban areas in the 1960s until the civil war in 1975 put a stop to it. They smuggled goods across the Syrian border in the 1980s until it was halted by the opening up of the Syrian market. They then had to return to their village. Orchards appeared as an attempt to intensify agricultural production, and quarries emerged as a sign of the struggle of the community to find alternative livelihood options.

Interactions between livelihood strategies and natural resource management were further explored by two MSc theses by Dick (2003) and El Hindi (2003). Dick analyzed the adaptation strategies employed by livestock herders in Arsaal in response to changes in their context and how these strategies affected livestock production systems with respect to herd size, herd movement and feed calendar. Dick also explored the interaction of these strategies with natural resource management in the village in terms of grazing areas and intensity as well as rangeland assessments.

El Hindi, on the other hand, explored the impact of shifting farming systems on land degradation. She first analyzed the driving forces which led to the shift in farming systems from traditional agropastoralism to an
intensive system based on fruit tree production. She then assessed the sustainability of the new system and looked at the impact of a new intervention – intercropping legumes under fruit trees – on soil fertility. In her study, El Hindi attempted to highlight linkages between livelihood strategies and practices such as the increased use of agricultural inputs for people with a diversified portfolio and the higher labour investment (especially in terms of tillage) for people who depend on agriculture.

**Cacti Elections**

Roll up! Roll up! The funfair has come to town!

El Harid is dreaming again . . . As he turns the corner into the village square, a dazzling sight meets his eyes. Gaudy carnival-style flags flap in the wind as he surveys the scene.

“When do the politicians arrive?” he asks a passer-by.

“They’ve been here all morning” is the reply.

A loud shout close by makes him jump to attention: “The greatest of all adventures awaits all who sign up here!” A great purple cactus dressed as a matador flamboyantly waves a red flag and spouts, “The danger, the thrills of Spanish exotica! Share a holiday combo in Spain with a Spaniard and swap cultural experiences. Bring tourism to Beirut, let them spend their euros here! In return, you can start a small business teaching Arabic to Middle Eastern immigrants.”

Slightly befuddled by all this information blasting at him, El Harid timidly raises his hand, “Excuse me, is there the possibility of providing a veterinarian to be located in Arsaal for the herders’ cooperative? There’s a real need – ”

“Forget that – Spanish beef is the best!!”

Embarrassed, El Harid scuttles away only to be pushed towards a second stall. A fluorescent yellow cactus wearing a false nose and a painted clown face shoves a can into his hands. Thinking it to be a can of soft drink, he goes to open it when . . .

“Don’t open it now! Wait till you get home. Fill your life with hilarity! Listen to canned jokes all day! Instant laughter in a can!”

Shocked and bewildered, El Harid edges away and catches sight of a serious-looking candidate in a raincoat (collar up), hat and shades.

This is more like it, he thinks and heads in the direction of the mafia-looking guy, who is addressing the crowd with a low and smooth voice. The audience is mesmerized.

El Harid pipes up, “Could we have some technical help from the ministry for training in organic agriculture?”

The shady character removes his shades, scrutinizes his prey for a second, then blows a poison dart, “How much?”

Disgusted and nauseated, El Harid stumbles away pulling down election posters as he retreats.

*Politicians in town . . . Must be election time!*
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Perplexity is the beginning of knowledge.

Khalil Gibran

Ottowa. June 2003. Honeysuckle scent wafts in through the open window where the writer sits in the darkness. The heat is stifling, and he is irritated by the power cut — no air conditioning, no computer, only his pencil scratching in candlelight — and yet excited as he prepares to conclude the whole story with the final chapter. Gradually, a pale glow of light emanates from the corner of the room where he usually appears. Yes, he’s here again and full of questions as always.

“Ahhh, ‘The Harvest’!” exclaims El Harid glancing down at the page.

“True, there’s a harvest all right. But will it last? Is there hope?”

“What do you mean?” Shadi asks, surprised at this point to hear a shade of doubt in his voice.

“Well, people back home in Arsaal are expressing concern as to what this project really means for our future.”

“But I got the impression that the local community were pleased, that they have benefited so much, they have acquired more skills, can manage resources better and so on . . . or so the ARDA members expressed,” Shadi trails off pensively.

“True, some feel that way, but some others have so many unanswered questions. They want to know what is next, will the real benefits remain and continue? Then there are some who are really cynical of any external intervention, believing it to just help for a while but then go elsewhere, and others who state that without the active role of the government nothing can be sustained. And, of course, do you realize there are some lunatics who think you are nothing but American spies!” he laughs. “I’m not exaggerating! But – ”

Shadi interrupts, “I don’t blame them; we all live with uncertainty. Look at this! A major power cut and life in the West stops. Where does change at a local level stand in the face of global forces?”

“But remarkably . . . I’ve been asked to thank you on behalf of the local community.”

“Well, that’s encouraging.”
Suddenly, the power comes back on. Shadi turns to his desk and begins to write “The Harvest”.

In this final chapter, we attempt to reflect on the project experience, assess its legacy from a community development perspective, and draw implications for the development research process with emphasis on the MENA dryland context.

**More on the Participatory Approach**

The successes and hardships experienced by LUN led to a more basic question in the minds of some of us: Is it really possible to involve the local community in a participatory manner while its traditional systems of communication are breaking down under the pressure of a globalized world?

The phenomenon of parabolic dishes spreading all over the roofs of poor villages in the MENA region is of surreal dimensions. The pastoralists of Arsaal, living relics of the ancient system, are no exception. Television sets travel with them in their tents. Long foregone are the lively evening conversations, the traditional songs and chants. Bombarded with all kinds of alien information, people sit perplexed, barely talking to each other. They see their traditional way of living falter around them, surrounded by unfriendly forces which they can not grasp. Confronted with the outside world, they become either apprehensive or falsely accommodating.

It was in such a context that “participatory communication” was initiated with the pastoralists in Arsaal, one of the most marginalized groups in the Lebanese society. It took four years of in-depth discussions with the project’s rural scientist literally acting as a translator (from development jargon to traditional concepts) and the use of various incentives to bring about a congruence in problem statements which could be resolved by means of the same solution: the establishment of a cooperative. The communication of information, persuasion in the form of conversations and negotiations, and even incentives were simply not enough to pass onto the pastoralists the “enlightened solution” proposed by the project to problems they were aware that they had. Instead, it took four years of cooperative work among them to impart the new “knowledge” of a 20th century concept such as a cooperative of livestock herders. It took a whole four years of sweat, tears (caused by dust), and 10,000 vaccinated sheep and goats to encrypt the new information into acquired knowledge that they could relate to their old system of values and practices. Only then
could the knowledge be translated into action and the cooperative could see the light. Fortunately, the vaccines were provided free of charge by the Ministry of Agriculture.

Information can be disseminated; knowledge cannot. This issue is at the heart of any participatory process. LUN, based on a traditional model, proved to be a successful channel for communication. Knowledge was shared regardless of the cultural origin of the members. This was what LUN was able to offer within a specific context and in a specific time frame. True participation requires the rural people and the professional scientists involved to stretch their imaginations, their skills and their definition of science (Rocheleau 1994).

**Participatory GIS for Natural Resource Management**

The PGIS approach proved to be a useful, practical and cost-effective tool that successfully delivered the product it was meant to: accurate georeferenced information, in the form of a set of maps covering the study areas, that is recognized and readily adopted by local communities and other stakeholders. A good understanding of the nature of the dynamic pressures exerting on the terrestrial ecosystems of Arsal was achieved that could constitute the basis of sound land management.

One of the main limitations of the mapping approach was uncovered when we tried to define soil units. Our approach relied on representing soil units as clearly delineated polygons. This fell short of fully reflecting the local knowledge of soils forming a continuum with different soil types integrating into one another rather than being clearly defined patches on the landscape with well-delineated boundaries. Farmers in the project areas consider soil units as being composed of “mostly this, with some of that”. This “fuzzy” approach does not appear to be specific to Lebanon, as it was also reported in Highland New Guinea (Sillitoe 1998). Its usefulness is clear as it allows the flexibility to adapt to changes in the landscape, which is necessary in dissected highland areas where the relief can create a multitude of soil types.

We also found that, while it was possible for the local community to geographically locate a zone with great accuracy on a white sheet of paper as well as on a satellite image, it was not possible to rely on their perception of dimensions when drawing freehand on a white sheet. The size (surface area) they allocated to a certain zone depended directly on the importance this location had to their livelihood.
Implementing the participatory land analysis was an enriching process for the researchers and the community. For the researchers, the insights gained from indigenous knowledge were invaluable in many respects. Indigenous knowledge was a crucial resource for identifying the biophysical characters of the land relevant to the land evaluation process. Conventional options, such as baseline surveys, would have been either impossible or too costly. Adopting the local nomenclature for the agroecological zones had a number of positive outcomes: It greatly enhanced the trust-building process, as the community appreciated that the researchers valued their knowledge. This increased their commitment to the project and to its outcome. It also gave the researchers valuable insights into the way the local people perceive their environment, which was helpful in the implementation of other components of the project. The participatory process also revealed some of the limitations regarding the use of GIS technology. The advantage of GIS in land use studies is clear: the tool’s data storage and processing capabilities provided an invaluable, time-saving support system. The presentation capabilities of GIS were appreciated much more by the researchers than by the local farmers. However, the farmers’ lack of familiarity with maps and other forms of geographic representations, such as contour lines and land cover polygons, may partly account for that. As a result, throughout the participatory processes, the majority of the participants were unable to use the maps freely, requiring the researchers to act as interpreters. Comprehension of visual presentation material by non-specialists has been identified as a major issue in the use of GIS. Draping these three-dimensional models with specific digital coverages (of soils, land cover) has been suggested as one means to aid comprehension (Theocharopoulos et al. 1995). Our experience in this project shows that such a three-dimensional model remains poorly comprehensible by the local people. We found, however, that landowners could visualize their lands as cadastral parcels with clearly defined boundaries, as this representation relates to their perceptions of land ownership and tenure.

During the participatory research process, the farmers were understandably more concerned with the biophysical characteristics of their parcels than with those of the village land, even though the latter may include common land of public access (for grazing, for instance). The classical map representations using polygons and lines gained local relevance when the attributes were expressed on a parcel basis. In other words, while the project researchers were more interested in the holistic perspective of the land and its potential, the local people were more interested in a micro-level analysis that would
inform them about their own parcel in the greatest possible detail. However, the land covered by the project included thousands of parcels, which were impossible to represent digitally during the project’s time frame.

Certainly, the matter of true ownership of the product of PGIS remains at the forefront of our concerns. In our examination of PGIS over the course of numerous approaches, a number of issues were highlighted. Some of these apply to all areas of participatory research, and others are specific to PGIS. For example, in the early phase of the project, we found that in many instances the local people were “being participated” rather than truly participating in the process. This was primarily due to our researchers’ bias, which imposed a priority that was not always the same as the local people’s. This was the case, for instance, with issues related to the conservation of biodiversity, still an elusive concept for farmers in the South (Zurayk and Haidar 2002). At other times, however, successful participation was achieved, as the local community had themselves expressed their interest in the outcomes of the analyses. This was the case when we planned together future orchard development in Arsaal and the location of rainwater-harvesting reservoirs.

Our self-examination process also led us to identify issues that are specifically related to PGIS. One of these derives from the highly technical nature of PGIS. Unlike other participatory field tools, this one cannot at present be fully transferred to the local community, in view of the technological and human resource requirements. Very few people in the rural areas of the South have enough know-how in information technology to be adequately trained to take over the whole process. Thus, PGIS will always require an umbilical cord linking researchers with the local community.

**Local Appropriation**

One of the most difficult issues we still face is how much the local community will be able to use the project outcomes to improve their livelihoods after the project ends. This is a continuous source of frustration and relates to the whole development research approach. Over the past decade, we have, with the help of local communities, accumulated a large volume of information on the sustainable management of natural resources. Little of this information has ever been translated into knowledge, as very few rural development interventions have resulted from our research results. The piecemeal nature of development projects in the South and their highly politicized donor–government–community relationship are certainly to
blame. We may also share part of the responsibility for engaging in participatory development research without any assurance that this could ever lead to any improvement in the livelihoods of the community concerned. Our presence always has the effect of raising expectations, and in most cases these expectations remain unmet. This commonly leads the local community to reject the product of participatory research and to exclude themselves from further research endeavours. Little can we blame them, as by the project’s end both researchers and funding agencies would have fulfilled their agendas through publications and recognition, while all the local community has to show for it is a set of maps with fading colours.

Participatory research is not sufficient by itself. If the process does not go beyond the stage of problem definition, then it is not a process of development but rather of development tourism (Dudley 1993).

**Embedded Research**

While it is acknowledged that appropriate research is a major driving force for development, our experience shows that, in its present form, local participation in research, while leading to valuable information, often results in little change in the livelihoods of the target community. This has the effect of leaving dedicated researchers with the uneasy feeling of abusing the trust of the community by being the sole beneficiaries of the research process. Thus, the current approach of carrying out pertinent applied participatory research and then publishing the outcomes while hoping for the best for the community is proving to be inadequate. Research activities must be intimately linked to development activities, namely the transfer of resources. Only when the elements of development were injected into our community-based research process that change in the behaviour and aspirations of the people started to emerge. Such was the case of women and pastoralists who were truly galvanized by the proper mix of participatory research and resource transfer. Institutional building and empowerment were only a matter of time and dynamics.

It is unfortunate that some academic and development circles regard the “out of fashion” transfer of technology and the “in fashion” community-based participatory approach as opposing models. Our Arsaali experience indicates the obvious: that they are complementary stages of a cyclical development process based on knowledge empowerment.

There is a pressing need for a new paradigm in which development intervention is planned as an integral part of a process led by development
research. Not until we “embed” research into development are we going to be able to make a difference, whatever technological tool we adopt.

In the Arsaali context, whenever development interventions were linked to research activities, things would start to flow smoothly. Our research improved as it was built on real needs; we were able to tailor it and adjust it in an iterative fashion, and we were able to implement at the farmer’s field level the result of our research. We initiated an iterative process which is continuing and which truly comes close to full participation, rather than consultative participation, and it is the best we have ever achieved.

Then came the Iraq war, and the notion of “embedding” took on a whole new different meaning. We decided to keep it benign by referring to our approach as research embedded into development intervention.

The concept was recently presented at the World Forum on Ecosystem Approach to Health (IDRC, Montreal) under the name “Carting the Oxen: Putting Research into Development”. Embedded research is not a theoretical framework; it is how we do things in order to create change.

**Natural Resource Management Research in a World of Uncertainty**

The participatory resource analysis was successful in initiating debate on future land use in Arsaal. The community has gained awareness of the different risks and possibilities, while the consequences of land use choices were made evident. The question remains of whether this endeavour is likely to initiate any significant change in land use on the part of farmers. Land tenure, an important socioeconomic dimension of the land was, unfortunately, overlooked by the land capability evaluation framework. Insecure land tenure is common in Arsaal and is likely to be the foremost determinant of land use. This explains why farmers who only have access to marginal lands, or whose ownership is temporary or illegal, will establish new orchards in spite of their awareness of land degradation hazards. Of the institutions that affect how people interact with natural resources, none are more influential than property rights. Property rights not only dictate who may use which resource and in what ways, but they also shape the incentive for people to invest in and to sustain the resource base over time (Meinzen-Dick and Pradhan 2001).

Our initial failure to take on board elements of sociopolitical complexity may have stemmed from the increasingly acknowledged reality that community-based, participatory approaches to natural resource management
are often too simplistic and neglect questions of diverse and sometimes conflicting concerns of resource users (Mosse 1997; Agrawal and Gibson 1999), which was effectively the case in Arsaal. All too often, in the early phases of the project, we would discover a problem of concern to a particular user group, and then we would design a solution to it. Under this approach to natural resource management, the prospects were slim for resolving real conflicts between distinct interest groups. Moreover, such an approach tends to overshadow larger-scale processes operating behind the scenes which will likely localize themselves in another problem (Rocheleau et al. 1995). Complex sociopolitical, economic and ecological dynamics ranging from the local to the global often undermine participatory approaches to natural resource management and generate unpredictable outcomes and surprises (Mehta et al. 1999). Such uncertainties are further magnified in the vulnerable context of drylands, where ecological uncertainty in the form of drought is complicated by rapidly changing policy and economic environments (Ngaido et al. 1998).

Slowly but surely as the project proceeded, one question came to haunt us: How do Arsaali people sustain their livelihoods in an uncertain world and what institutional arrangements mediate their access to resources? The question called for a new development research approach that places people at the centre and provides an integrative comprehensive framework to natural resource management.

The sustainable rural livelihood framework popularized in the late 1990s provided a good starting point that could be built upon and adapted. Through this approach, we came to understand the diversified livelihood adopted by the Arsaali community which integrates fruit tree growing, quarrying and other types of employment in addition to the traditional agropastoralism. By investing in multiple options, Arsaalis could cope with various uncertainties and thus keep open diverse opportunities that would help them deal with future vagaries arising from sociopolitical, economic or ecological processes. We also came to understand the massive expropriation of common land accompanying the process of diversification. Essential livelihood uses form a basis for claiming land resources, even though formal rules prohibit such claims. Arsaali people react to hardship by appealing to a variety of norms regarding sharing and meeting basic human needs, instead of rules that give some the rights to exclude others during normal times.

The sustainable livelihood approach offers interesting insights for designing development research initiatives which are pertinent to local people and capable of generating the knowledge needed to enhance their
livelihoods. In our experience, the main value of this approach is that it provides an analysis of the vulnerability context in which individuals draw upon capital assets to build their livelihoods. It also helps develop an understanding of the structures and processes which define people’s livelihood options.

There are, however, major issues that remain unresolved by the sustainable livelihood framework. One of them is that the sustainability of rural livelihoods is not necessarily synonymous with the sustainability of all the ecological systems that make up these livelihoods. For example, the rapid increase in quarrying activity has had a serious impact on the natural capital of the community. However, the livelihood analysis showed that, without quarrying, the livelihood of many Arsaali would break down. Over the project’s life span, the community and our research team had tried to identify and facilitate “softer” alternative livelihoods but with limited success. The macro- and mesoeconomic systems in which this community exists tremendously limit the options. This brings us to the other problem of the sustainable livelihood framework, which is that it addresses the dryland predicament in developing countries largely at the micro (and sometimes the meso) level. However, in the current globalization mood, this falls short of dealing with most of the man-made predicaments. Market, policies, development models and political systems are all, to various degrees, products of the global climate.

**Policy Influence**

As researchers, we were fully aware of the project’s impacts, but these were not considered in policy terms. In fact, had IDRC from the outset urged us to make a specific objective for policy influence, we would have rejected the idea as inappropriate given the disabling policy environment in Lebanon. At the time of initiation of the project, the Lebanese government had no comprehensive development policies, and regional planning authorities were absent. This would have left little room for national adoption of any action plan developed at the community level.

Although the marginalization of Arsaal is not expected to end overnight, it is widely acknowledged that the village is less marginal today than at the time the project was started, and that is an important indicator of policy influence (Brooks 2002).

The institutional capacity building that was undertaken all through the project’s life – especially with ARDA, which served as a focal point for
the project – empowered a new generation of leaders who were elected to
the municipal council when the municipality of Arsaal was reestablished.
These leaders were influenced not only by the participatory dimension and
the economic benefits of the project itself, but also by the research outcomes
it generated and the institutional framework it established. And this is the
type of impact that will remain, even when the project will be long gone.

Unexpectedly, the Arsaal project rejuvenated and reshaped the approach
to research of AUB, where our research was centred. The project
reintroduced field research to AUB and provided an operational model for
linking the research foci and the research methodology to community
development. The snowball effect expanded beyond AUB to regional
institutions such as ICARDA, which now promotes the Arsaal approach
for its projects throughout the region, or the German technical assistance
programme GTZ, which fell across the Arsaal project almost by accident
and decided that the project’s approach provided the best entry point for
work against desertification.

The project also “inspired” and catalyzed the creation in 2001 of the
multidisciplinary ESDU at AUB. In collaboration with other faculties, donor
organizations, research institutes as well as NGOs, the unit delivers
programmes in research, education and training, and outreach. The ultimate
goal is to create a regional centre of excellence in sustainable development.

Looking at the more general institutional context, and despite the relative
imperviousness of the Ministry of Agriculture to both the process and the
results of the project, extension officers of the ministry now attend the
various workshops given in Arsaal. Pressured by public opinion, members
of parliament from the region follow up the different issues raised and
take them on a one-by-one basis to higher levels for action. LARI (part of
the Ministry of Agriculture) indicates that the Arsaal project has had an
enormous influence on how it foresees its role in research and how it
structures its research approach.

The two most important innovations of the project – ESDU at the
academic level and the natural resources platform at the community level
– seem likely to continue to operate, as do the cooperatives that were created
during the project. Linkages are being built from informal community
institutions to formal political structures, strongly at the municipal level
and tentatively at the national level. Evidence suggests that the community
relationships will continue and that the individual and group capacity building
will become self-sustaining. What might happen in terms of policy influence
with the senior levels of the government is much less clear (Brooks 2002).
Gender Issues

Participation of women in the public spheres provided by the project was evident. Women’s presence and participation in LUN discussions and activities was visible. This was to a large extent facilitated by ARDA, where there is a relatively strong female presence as beneficiaries, volunteers or members, even though they are a minority. However, women’s role in decision making and the extent to which they feel confident to argue and discuss in public remain highly questionable.

The women’s cooperative would normally have been expected to be rather more progressive on this front. However, this is only partially the case. It has to be noted that power and decision making in the women’s cooperative is concentrated in the hands of men.

As for the herders’ cooperative, women are not present either as members or as beneficiaries. This is evidently due to the fact that the pastoralist community is by and large patriarchal and male dominated. Obviously, the project provided women space in which to stretch the traditional boundaries of what is and is not acceptable.

More Harvest

Many more lessons were learned from the project. One of them is that multidisciplinarity is not in itself the answer to complex problems. It can easily become a rubber stamp representing a group of individuals who retreat to safe professional niches and produce a multidisciplinary set of mono-disciplinary papers. Too often, the task of synthesis and integration was passed on to some undefined actor in the process until we had the obvious, but brilliant, idea to have a physical integrator in the form of a PhD student. It worked well and the integrator went on to coauthor the present book.

The assumption that the community is always right and all local groups are equal or have enough technical knowledge to manage their resources is not only ill-founded but also patronizing. We have seen many cases in which social relations and power differences obstructed the actualization of rights and technical options.

Yet another lesson learned is that perceptions about natural resource management strategies in terms of success and failure are socially constructed not only by the local stakeholders involved but also by the researchers.
Finally, Arsal taught us that traditional and isolated communities can take development research seriously and respond eagerly to its outcomes. The new agenda calls for a more ethnographic approach where researchers must have the humility to listen to past and present stories of communities before attempting to solve their problems.

**Cactus Nightmare**

El Harid settles down for the night; he’s just finished reading chapter 6, “The Harvest”, and is impressed by the potential the researcher reveals. But he has difficulty sleeping; a nagging anxiety flutters in his stomach and quickens his heartbeat. Is it too late? Worse still, is it too little, too late? Can we catch up with the rest of the world?

Amidst this restlessness he sleeps, and then the nightmare begins . . .

The black, imposing shadow darkens the sky; a huge enemy is stalking him. And gaining ground – fast. The dreadful sound of a war horse’s hooves thunders behind. El Harid runs as fast as he can, but the massive cowboy cactus is too strong and powerful and easily outruns him, catching up within seconds. He hears a rope lashing through the air as it whips him up, looping around his neck. It tightens and El Harid splutters and gasps for air as he flies up through the air to be hung from a broad branch . . .

*The end*
He wakes up with a shrill scream and lies in the dark. Panting, sweating profusely. His thoughts are racing . . . It was all a dream. A vivid hallucination of the end of everything. Events out of my control taking over and finishing me off.

His breathing is heavy and laboured but slowly eases as his fear subsides. Gradually, he becomes aware of a tingling sensation on his body coupled with a lovely presence in the room.

What’s that amazing smell?

El Harid gets up and, on drawing back the shutters, is startled as the light falls on the most beautiful flower he has ever seen – attached to him! It bestows him with a radiant glow.

He breathes a long sigh of relief.


About the Authors

Shadi Hamadeh studied at the American University of Beirut (AUB) and at the New Mexico State University, USA. He is professor of animal sciences at AUB since 1988. His research interests have ranged from animal and environment interactions to the future of pastoralism. He is co-founder of several conservation groups in Lebanon and the region and is currently leading the Environment and Sustainable Development Unit (ESDU) at AUB focusing on rural sustainable livelihoods in dry lands of the Middle East and North Africa. One of his major challenges is to reconcile the chaos theory with the bitter realities of development research in the Arab World.

Rami Zurayk studied at AUB and at Oxford University. He is currently professor of soils and environmental sciences at AUB. He specialises in ecosystem management. After having held the post of country representative of the International Cooperation for Development in Yemen in the early 1990’s, he returned to AUB where he contributed to the initiation of ESDU. He has since been in charge of the implementation of a number of medium to large scale rural development projects, and has served as an international consultant in natural resources management. He firmly believes that development work should become self-funded and liberate itself from the agendas of donors. He has recently submitted a grant proposal to that effect.

Mona Haidar studied at AUB, the University of London and is currently putting the finishing touches to her doctoral thesis in rural development at the Institut National Agronomique Paris-Grignon. She specialises in livelihood analysis and rural development. Mona is currently a research associate affiliated to ESDU and has served as a regional and international consultant involved in the design, monitoring and evaluation of interventions aimed at the promotion of sustainable livelihoods in the rural areas of the Middle East and North Africa region.