



IMPRESSIONS OF ISRAEL: A PERMACULTURE PERSPECTIVE

This article was written in May 1994 while travelling in Europe following my time teaching and researching sustainable alternatives in Israel, and was published in the newsletter of the new local permaculture association.



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Trying to arrive at some overview of such a complex country is not easy after a six week visit. On top of seeing the country for the first time, it was also my first experience of the Mediterranean. The following comments cannot address any issue in depth but are intended to give those interested in sustainable alternatives, both in Israel and elsewhere, some permaculture perspectives of this unique country. Many of my points could be the subject of whole articles and inevitably my critical comments run the risk of arousing defensive reactions from Israelis, but hopefully they will be taken as constructive.

Israel is the biblical “land of milk and honey”; milk from the abundance of its herbaceous and arboraceous forages which supported the goats of the forefathers, and honey from the abundance of its Mediterranean flora. Maybe I should say WAS the land of milk and honey, because the course of history has taken an incredible toll on the soil, water, flora and fauna resources of the land. It was inspiring to see what the commitment to the restoration of nature from the beginning of the nation state had achieved in a few decades. Reafforestation and restoration of wildlife populations has now reached a level in many parts of the country where natural processes are building on the efforts of people. Much of this work is still funded from outside Israel via the Karem Kayemet (Jewish National Fund). Perhaps as a consequence of overseas aid, the pioneering and innovative work in nature restoration seems to have been reduced to established and bureaucratic ways. This is in stark contrast with the dynamic innovation emerging from the more “grass roots” Landcare Movement in Australia. For example, I was surprised at the relatively limited range of species used in revegetation, and the apparent lack of direct seeding or planting machines for broad scale establishment of trees and shrubs.

WATER RESOURCES

Development of water resources and irrigation agriculture are well known achievements of Israel. Although the country is very dry, I was impressed by the quantity and quality of water resources nature has provided, when compared with much of Australia. The Kinneret (Sea of Galilee), a massive freshwater reservoir over 300m below sea level in a semi-arid region is a wondrous ecological anomaly which is supposed to be no more than 16,000 years old. With this and extensive ground water aquifers, Israel has made the desert bloom. But as in Australia, the provision of cheap water for settlements and agriculture has resulted in excessive use and waste. In Australia over-irrigation has mobilised massive quantities of salt which is destroying the land. The geologic youth of Israel makes it less susceptible to large scale salinity but overuse of water, in combination with highly chemicalised agriculture and industry, is creating severe ground water pollution hazards.

Israel is famous for its development of drip irrigation, an appropriate use of plastics technology which can efficiently use limited water resources. In Australia, the progressive adoption of this technology has gone hand-in-hand with mulching with organic materials for moisture conservation and soil improvement. In Israel, drip irrigation is almost universal in horticulture and landscaping but mulching, except with plastic sheeting,

is conspicuous by its absence. Huge surpluses of agricultural and forestry wastes offer great potential for beginning the “organic revolution” in Israeli horticulture. This is particularly important in the rapidly expanding amenity and ornamental horticulture sectors which are already consuming a significant proportion of precious water resources. Amenity planting without irrigation seems rare, even in the relatively well watered north of the country. There is a widespread belief that only a few slow growing native species can be grown without irrigation. For me it was exciting to see species originating from semi-arid and even sub humid regions of southern Australia growing successfully without irrigation in much hotter and drier arid areas of Israel. Drooping Sheoak (*Allocasuarina verticillata*), *Acacia saligna* and Grey Box (*E. microcarpa*) are examples which come to mind. I saw very few truly arid zone Australian trees and shrubs planted and wondered whether they would push the boundaries of where unirrigated revegetation was possible. Areas around Beer Sheva receiving 200mm of rain annually have similar weeds, crops and trees thriving to those found in the Wimmera region of Victoria which receives 350-450mm annually. It appears that high incidence of dew and humidity in summer more than compensate for the very low measured precipitation and higher summer temperatures in Israel. Higher levels of mineral fertility in Israel may also be a factor. Consequently the range of plant materials suitable for landscaping, forestry and unirrigated agriculture is much greater in Israel than in most of dry land Australia.

DRY LAND FORESTRY

A particular interest for me in Israel was to see if production of fuel and timber products from dry land hill country could be improved to lessen future dependence on imported wood, or more energy intensive materials, such as concrete and steel, as well as fossil fuels. Conventional analysis suggests Israel is too dry for reasonable growth rates from unirrigated timber trees, but my observations noted above suggested more hope. Some species of eucalypts have already proven very productive and plantations are currently managed on a short rotation for fuel wood and low value sawn timber. Management of this substantial resource (mostly *E.camaldulensis*) seems to be improving but this species does best along moist waddi and low arable land. Allocation of these very biologically productive sites to high water using timber and fuel species is poor use of land capable of producing food. Marginal limestone hills in the Galilee are the places for extensive forestry but so far native pines and cypresses have been the main species planted. While considerable production is now coming from these forests, slow growth rates, disease, vulnerability to fire and poor form (*Pinus halapensis*) are major problems. Thinking about eucalyptus species which would grow better than *E.camaldulensis* on dry limestone hills and produce better timber, I came up with Sugar Gum (*E.cladocalyx*) amongst others. It was refreshing to meet with Dr Yehuda Reve, a forester with the Karem Kayemet who has been promoting Sugar Gum for some years based on the results of a few early plantings.

Mixed forest is always preferable to monoculture, a lesson being learnt in Israel following the problems with conifers. A permaculture approach to plantation design suggests a

fast, growing nitrogen fixing species should be used with any timber conifer or eucalypt. Tall acacias such as *Acacia decurrens*, for short rotation firewood or bushy *Tagasaste* [*Chamaecytisus palmensis*] for animal fodder would be good prospects for planting with Sugar Gum. Slower growing species, such as Californian evergreen oaks, could be under planted for timber, and other uses.

Despite the extensive nature of revegetation over several decades, the range of species which has been used is surprisingly small. Following the permaculture principle of diversity provides the next generation with the genetic and information base for more informed choices in the future.

ANCIENT SYSTEMS, MODERN EXPERIMENTATION

The development of modern dry land agriculture and forestry based on the adaption of ancient and traditional systems is the challenge for those concerned with sustainable systems, to make productive use of the land in the 21st century. While in Israel I saw the results of two related endeavours which represent major contributions to sustainable dry land agriculture. The first was the research work of Michaeli Evenari and his colleagues in farming the arid Negev (approx. 100mm rainfall) using natural runoff from the stony desert hills. This work, from the 1960's to the 1980's is documented in *The Negev: The Challenge Of A Desert* (Harvard Uni. Press 1986), an excellent example of interdisciplinary science which proved that the ancient Nabatean systems were capable of producing good yields from tree and field crops, and that even simpler systems of micro catchments could support tree crops such as Pistachio, Carob, Olive, Pomegranate and even deciduous fruit trees. I think it is a tragedy of the first order that this work at Avdat and other research stations, lies virtually abandoned. Weak statements and promotion emerge from the academic and government establishments about runoff systems being suited to Africa and other third world countries, but not being viable in Israel, a pragmatic but shortsighted conclusion, based on the continued availability of cheap reticulated supply from the Kinneret and ground water reservoirs.

On Kibbutz Hazorea I met John Maurice and saw his work developing very small fibrous rooted grafted plant stock of tree crop species such as Carob, Pistachio, Pecan and others which are similarly difficult to propagate and transplant. Despite John Maurice's lifetime experience in tree crop horticulture and nursery production (including some time at Avdat with Evenari) his current work appears to have the status of a personal retirement hobby ignored by the academic and industry establishment. There is great potential to apply this work in combination with drip and runoff irrigation in the Negev. In the moister parts of the Galilee and Samarian hills (Israel and the West Bank) the productivity of traditional arab grazing could be improved by planting traditional fodder trees (Carob). The application of these simple propagation methods to the third world (as well as parts of Australia) is of much greater relevance than the much promoted high tech tissue culture.

THE BEDOUIN

Although I didn't have the opportunity to visit permaculture projects on the West Bank, I did meet with people working for a less well known self determination movement, that of land and other rights for the Bedouin people of the Negev. 80% of the Negev is closed military areas and in the remainder Bedouin people are in dispute with the government, that wants to resettle these people. The modern towns built especially for them are not suitable for traditional extended family life and have no provision for agriculture and animal grazing.

The "illegal" dwellings, gardens and runoff agriculture on traditional land had no roads, electricity, sewerage or water supply other than one 20mm outlet for a whole settlement. It could be argued that the dispersed nature of the Bedouin settlements make them too expensive for conventional services. But it is clear that if the government was prepared to negotiate on the issue of land rights and recognise that a self reliant lifestyle for the Bedouin will result in less social and political problems than forced resettlement, then technical solutions which are compatible with financial, environmental and traditional requirements could be found. Passive solar design combined with traditional wood cooking, solar electric systems, roof water collection to tanks and cisterns, better design of earth roads integrated with runoff collection systems, appropriate tree and shrub animal fodder, fuel and timber systems and mulch gardens around extended family housing clusters are examples which were discussed during and after my visits to the settlements around Beer Sheva. Like all traditional peoples in transition, the danger of being seduced by the pervasive consumer television culture and conventional development models is high, even if the Israeli state was more willing to consider Bedouin aspirations. The story of the Bedouin has its own unique complexity but is also one more case of tragic transition from traditional to industrial systems when the elements from which to build more sustainable systems are available.

The recreation of the land of milk and honey will take some generations, even assuming Israelis can learn from their brief history, reverse the destructive consumerism of recent decades and come to terms with their arab neighbours. One contribution to that enormously complex last problem would be to recognise the value and wisdom inherent in some aspects of traditional arab and Bedouin land use (as was suggested by some early kibbutz pioneers) and at the same time help avert the disastrous headlong rush of the Arabs to copy all unsustainable high energy Israeli systems of land use.