

# From ECOVILLA to SRWD: Pilot project proposals

G. K. Hartmann<sup>1</sup>

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## Abstract

In chronological order the abstracts of 6 different scientific-technical environmental pilot project proposals conceived in the last 15 years will be presented. Five projects are of local nature and the sixth is a combination of local and global activities. The political respectively the socio-economic-ecologic boundary conditions will be nearly disregarded here. However, they have not only led to modifications of the previous proposals but stepwise also to new proposals and to the fact that until now they could not be made concrete. The experiences made in this time period, especially those of the Sure-Tec.Com Team and those from most larger environmental organisations – governmental as well as non-governmental organisations (NGOs) and private ones - led to the most recent pilot project proposal **Solar Reflector Water Destillation (SRWD)**, which will be discussed in more detail. For a longer term survival of such projects relevant information and documentation systems that contribute to a reduction of the so called “digital divide”<sup>\*</sup> e.g. like the DUST-2 and ADLATUS activities are inevitable. See file: [33months.pdf](#) and [www.science-softcon.de](http://www.science-softcon.de)

<sup>\*</sup>**Digital Divide:** This means the gap between the (exponential) accumulation and growth rate of **potential** information (e.g. “raw data”) and the increasing lack of timely available **actual** (qualified filtered, understandable) information. The present increase of the digital divide is predominantly caused by the fast progress of the “digital IT (Information Technology) tools” and is amplified by the lack or decrease of human and financial resources.

## I. Chronicle of the MPAe co-operation with the University Mendoza (UM): ECOVILLA

1983 MPAE - Balloon launch for trace gas measurements in Mendoza (P. Fabian et al.)

1985 Begin of two DAAD fellowships by Ing .E. Puliafito and Ing. C. Puliafito from UM in the project: microwave spectroscopy of the Earth’s atmosphere at MPAE. The

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**Remark:** The author is not responsible for the content of foreign linked pages

<sup>1</sup> Dr. G. K. Hartmann, science-softCon, Auf der Burg 4, 63477 Maintal, Germany, [www.science-softcon.de](http://www.science-softcon.de) ; [gkhartmann@science-softcon.de](mailto:gkhartmann@science-softcon.de) , Phone: +49-6181-46968; <http://www.science-softcon.de/gkhartmann/> Privatmail: [gkhartmann@web.de](mailto:gkhartmann@web.de), Pfarrer Opielka Str. 9, 37434 Bilshausen, Germany.

- fellowships were terminated with the German titles Dr. Ing. E. Puliafito and Dipl.Ing.C. Puliafito.
- 1986 Because of the Space Shuttle accident postponement of **MAS** launch by 3 years. (*MAS: Millimeter Wave Atmospheric Sounder, from Space Shuttle, a joint German-US-Swiss experiment with the principal investigator (PI) G. K. Hartmann from MPAE. Modification of the MPAE microwave project. G. Hartmann guest professor for „filter and information theory“ at UM, since then annual lectures and seminars).*
- 1988 Ratification of an environmental research program (PRIDEMA) between the University of Mendoza and the government of the Province Mendoza. G.K. Hartmann was appointed as its international co-ordinator. First planning for the ecovillage project „**ECOVILLA**“ (Phase A1 Study). Guest professorship for G. K. Hartmann was extended by the topic “Remote sensing for a **conserving utilisation** of the environment”
- 1989 Bilateral Cupertino contract between MPAe and UM. „Solar chimney“ proposal for **ECOVILLA** together with the engineering bureau Schlaich et al., Stuttgart.
- 1990 First contact with the international bureau (IB) of the BMBF at GKSS, in the frame of the Argentinean - German Scientific Technical Cupertino (WTZ:) (Dipl. Ing. H. Bianchi. Since 1997 Dipl. Phys. M. Hermes, IB North - and South America, DLR Bonn)
- 1991 (till 1998) IB sponsored project „TROPWA“ ARG. ENV 4., G. Hartmann Co-PI; G: K. Hartmann appointed as honorary, external, scientific director of the UM environmental institute „IEMA“ and as full professor (profesor titular) at UM for „remote sensing for a conserving utilisation of the environment.“ He received the Dr. Luis Federico Leloir Medal for international scientific co-operation with Argentina in the field of environmental research on Dec. 12<sup>th</sup> 1991 in Buenos Aires from Prof. Dr. R. F. Matera, the Argentinean minister for science and technology.
- 1992 Launch of the first NASA ATLAS Space shuttle mission with MAS as a core payload. Dr. E. Puliafito from UM participated as member of the international MAS team.
- 1993 Soil sealing and recultivation proposal (SOREC) for ECOVILLA together with engineering bureau Siedek and Kügler, Essen (Dipl. Ing. J. U Kügler).
- 1994 The Rector of the University of Mendoza (UM), Prof. Ing. Salvador Puliafito, died in a car accident. Begin of the doctorate program of the engineering faculty of UM. Termination of Phase B of the ECOVILLA planning. The new rector of UM Prof. Dr. C. Menghini supports research and environmental activities much less than his predecessor. Begin of co-operation with UFZ Leipzig/Halle (W. Weissflog). Governmental support for WTZ programs has been reduced since then.
- 1997 Proposal „Local Ecovillage Development and Global Environmental Monitoring of the Earth’s Atmosphere, with a development of technical basis modules for “ecovillages”
- 1998 Modification of the post graduate study of the engineering faculty of UM.
- 1999 Continuation of the projects and proposals, seminars and tutoring of Ph.D. works
- 2000 The research project ARG ENV 4 (TROPWA) which dealt - in context with the Argentinean – German scientific technical co-operation (WTZ) - with the measurements of ozone and water vapour of the Earth Atmosphere with remote sensing methods in the Mendoza region – G. K. Hartmann was its principal investigator – was officially terminated in December 1998 and is still continued on the bilateral UM-MPAe basis.
- 2001 continuation of the co-operation in context with the Ph.D. and DAAD program of the engineering faculty of UM. G. Hartmann referee for various UM Ph.D. thesis: Dipl. Ing. C. M. Puliafito, Ing. Favier, Ing. S. Leguizamon, Ing. J. L. Puliafito. Further activities:
- a) Joint UM-MPAe publications; b) joint validation of data from the Earth Atmosphere (O<sub>3</sub>, H<sub>2</sub>O etc.).

2002/2003 continuation of work but no visits of G. Hartmann at UM because of missing travel funds.

From 1986 –1995 also various seminar talks in Buenos Aires

### **Co-operation with Universities in Santiago and Concepción (udec) in Chile**

Since 1986 till 2001 parallel to the “UM activities” also annual visits by G. K. Hartmann in Chile with lectures and seminars. Main topics: “Conserving utilisation of the environment”; Smog reduction in Santiago; Remote sensing methods and atmospheric research; Information (data) growth rate problems; Filter theory; Empirical science and philosophy: The consequences of the rediscovered (Niels Bohr, 1928) complementarity principle; Science and economy.

Main contacts: Profs. Drs.: Harald Sagner, Otto Dörr-Zegers, Burkhard Seeger, Rolando Hernandez, Eligio Amthauer et al.

## **II. Local Eco-Village Development and Global Environmental Monitoring (LEDGEM) : A pilotproject** (Executive summary by G. K. Hartmann, June 1998)

*Global thinking, local acting with an intercultural, interdisciplinary, and intergenerational dialogue*

### **Introduction**

The increasing globalisation of the economy and the increasing global environmental problems, especially in context with the Earth atmosphere, cause an increasing tension between local acting and global thinking. The better the human beings can synergistically use („aufheben“) this tension the better are the chances for their survival and a better quality of life.

**Local acting:** Local cultural compatible, adjusted eco-village development (**part 1 of the pilot project** which is dominated by (sustainable, conserving utilising) tech)

The exhaustion of the resource fluxes that feed the production structure of an artificial oasis (fed through external water) as well as other „villages“ in areas with fresh water problems constitutes these days one of the most important problems. This critical situation is mainly due to the increase of population along with urban growth in size and the progressive erosion of the soil caused by natural and anthropogenic influences. This problem has not only economic consequences but also more fundamental ones. The deterioration of the potentiality of the productive zones yields a migration from rural zones to the cities. This phenomenon produces a drainage of a large amount of economic resources from all the regions to the cities and thus contributes to an increasing economic unbalance and finally to socio-economic-ecologic instability because the growth possibilities in the rural zones decrease even more. The eco-village development will counteract this trend.

**Global thinking:** Global monitoring of the Earth’s atmosphere (**part 2 of the pilot project** which is dominated by high tech)

The Millimeter wave Atmospheric Sounder, i.e. the proposed MAS Follow-on experiment will supply for *the first time* the possibility to measure from space, i.e. from the International Space Station Alpha (ISSA), simultaneously in the tropopause region *water vapor and liquid water* - through a unique combination of MAS with a GPS/GLONASS (GRAS) receiver and a star sensor. The expected data are especially important for climatological research in the equatorial region. Furthermore the adaptation of MAS to the conditions of the International Space Station Alpha (ISSA) - its EXPRESS Pallet - will also allow to introduce and test new

technologies, and to create - under the difficult ISSA conditions - the possibilities for future autonomous, operational (dedicated) satellite instruments for operational observations of the Earth. The MAS data should be complemented and validated with relevant (microwave) measurements from the ground, aircrafts, balloons, rockets, and other satellites. To meet the flight possibility UF4, with the first Express pallet flight to the ISSA in the year 2002, official negotiations with NASA need to be started very soon.

## ***II.1 Local Eco-Village Development, part 1 of the proposal***

### **Project objectives**

1. **Supply and processing** of fresh (*drinking*) **water and water for irrigation**, e.g. by solar desalination of sea water and/or (solar) treatment of polluted ground water - inclusive water from rivers and lakes - e.g. by applying solar stills together with stirling pumps complemented by special filter processes. Rack and **storage** of that water into natural and artificial reservoirs, the latter might be designed and built using new soil sealing technologies; including water protection.
2. **Energy production** and (local) energy storage by non-conventional means, especially solar energy - thermic and photovoltaic - as well as by water and wind energy
3. **Soil treatment**, e.g. with new recultivation methods, and application of intensive conserving agricultural techniques, especially considering the use of „combined greenhouses“
4. **Prevention** of local **air pollution** and protection from the consequences of local, regional, and global air pollution which implies also the investigation of eco-toxicological effects.
5. Cultural acceptable **architecture**
6. **Garbage treatment** from non-industrial and industrial sources - inclusive immobilisation of toxic substances, reuse, and recycling. Usage of at least the non-industrialised garbage products as fertilizer or as „construction material“, e.g. for soil conditioning and soil sealing processes
7. **Re-forestation** and cultivation of hedges comparable to the hedges from H. Benjes
8. **Promotion of a village** with rural - respectively tribal and/or ecumenical - and small manufacturing (industrial) characteristics, encouraging the development of applied craftsmanship and urbanization with environmental and cultural compatible architecture as well as with feed back - symbiosis and competition -with larger industry.
9. **Comparison** of the pilot project results with computer model calculations and preparation of a report comprising intercultural discussion of the results and future needed work, especially for a larger project with larger socio-economic-ecological dimensions.
10. Start of a relevant **documentation and information system** (S. Engelmann)

Remarks:

The author acts right now as scientific/technical advisor for the present project team.

The author thanks the colleagues and friends from IEMA-UM in Mendoza Argentina, for the good co-operation and discussions of the IEMA project proposal **ECOVILLA**, which supplied essential experiences for the **Ecovillage** concept. He further thanks in this context Dipl.-Geogr. S. Engelmann for scientific technical documentation support and discussions on its special geographic aspects.

See also (in German): „Technische Ökodorfmodule: Ergebnisse aus 14 Jahren Zusammenarbeit mit Argentinien und Chile“. MPAE-L-015-98-11, 1998.

## ***II.2 Global Environmental Monitoring with the MAS Follow-on experiment***

Remark: After the recent NASA Space Shuttle accident there is no chance of a realisation of a project like this in the near future, therefore details on the Millimeter Wave Atmospheric Sounder (MAS) Follow-on for the EXPRESS Pallet of the International Space Station (ISSA) have been skipped in December 2003.

### III. Desert Soil Recultivation and Monitoring of (phyto-) Toxicity (DEREMOTOX): A pilot project in three phases lasting four years.

Presentation at BMBF/UNESCO Seminar on Ecological Problems of sustainable land use in deserts. May 5 – 9, 1999, Bonn Königswinter.

**G.K. Hartmann**, MPAE, Katlenburg-Lindau \*; J. U. Kügler, P. Belouschek, Eng. bureau Kügler; Essen, L. Weissflog, UFZ, Leipzig, K.H. Weiler, FHO-Emden, H. Ch. Heydecke, Math.-Web., Eldingen; G. Reisinger, Eng. bureau, Illertissen; Germany  
**G. S. Golitsyn**, I. Granberg, N. P. Elansky; IAP, Moscow; E.B. Gabunshina, Kalmykian Arid Center, Elista; V. V. Alexeev, MSU, Moscow; Russia, **E. Putz**, G. Pfister, A. Steiner, IMG/UoG, Graz; Austria

#### Abstract

DEREMOTOX is a Research and Development (R&D) pilot project for the development of "smarter" technological modules especially for and in small eco-systems and for optimizing the also necessary monitoring and risk assessments. Mainly it is dealt with the low risk further development of so called "prototype" modules or processes. Smarter in this context means: resource efficient, i.e. with higher resource productivity, long-lived, labour intensive, low cost mass production of simple (user-friendly), basically needed (technical) modules, adaptable for various local situations. It is proposed to combine/apply at least the following methods in the selected area for recultivation, the Kalmykian steppe:

1. The (new), successfully tested "Soil Conditioning Process" proposed in 1994 by J. Kügler et al. under the acronym **SOREC** (**S**oil sealing and **R**ecultivation), combined with so called brush walls or so called "Benjes Hedges" (**BENHEDGE**), and complemented with: **Solar cooking and solar water sterilization** at the recultivation location and with the **extraction of fresh water from atmospheric water vapour** in arid regions.
2. Modified and complemented **Phyto-Toxicological Investigations (PTI)** as done in context with the EU research project ECCA. The PTI part is subdivided into three parts: a) Analysis of local pollution pattern and its effects, b) Investigation of pollution transport and deposition mechanisms, c) Concept for a future pollution control and protection from pollution and other external hazards, e.g. through a **greenhouse** which should be simultaneously tested.

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**Phase A** (*first 12 months*): Determination of boundary conditions in a location to be selected in the Kalmykian steppe with respect to: a) political, legal, and infrastructure aspects, b) geographic and climatic aspects, c) available resources and local soil conditions, d) status of (phyto-)toxicity. Rough cost estimates and start of fundraising.

**Phase B** (*the following six months*): Detailed end to end planning using amongst others the so called **MIPS** concept. Assembling of the DEREMOTOX team. Refined cost compilation for phase C and final fundraising for it.

**Phase C**: (*last 30 months*) construction and evaluation phase

*Remarks:*

- *These methods are also required when we deal with preservation of still possible agricultural land use but which is endangered by erosion and pollution processes.*
- *Costs for phase A: t.b.d.*
- *MIPS: Material Input Per Service Unit. Concept developed at the Wuppertal Institut für Klima, Umwelt, Energie, Döppersberg 19, D-42004 Wuppertal, Germany. <http://www.wupperinst.org>*

Remark: The project could not be carried out because of the war in Tschetschenia.

**See also book article:**

Hartmann, G. K., J. U. Kügler, P. Belouschek, L. Weissflog, K.H. Weiler, H. Ch. Heydecke, G. Reisinger (Germany), G. S. Golitsyn, I. Granberg, N. P. Elansky; E.B. Gabunshina, V. V. Alexeev (Russian Federation), E. Putz,

G. Pfister, A. Steiner (Austria) “**Desert Soil Recultivation and Monitoring of (phyto-) Toxicity (DEREMOTOX). A pilot project in three phases lasting four years**“ in: S. W. Breckle, M. Veste, W. Wucherer (eds.), “**Sustainable Land Use in Deserts**”, pp. 329 –342, ISBN 3-5340-67762-3, Springer Verlag Berlin Heidelberg New York, 2001.

#### IV. [www.sure-tec.com](http://www.sure-tec.com)

Proposed Sept. 2000 by

**G. K. Hartmann, H-G. Flepp K. C. Hsieh, E. Schircks, M. G. Ritter et al.**

[www.sure-tec.com](http://www.sure-tec.com) :Trade mark Nr. 301 22 240 registered at German Patent office in Munich for Prof. Dr. G. K. Hartmann.

First presentation of the sure-tec.com project by G. K. Hartmann on 30th Nov. 2000 in Celle, Germany at the DII.

#### **Abstract**

##### **Problem:**

As the technologically advanced nations are lifted by the tide of mercantile globalisation, there remain large pockets of populations, which do not benefit from the generation and flow of material wealth. In these desolate areas, while the population in their more productive years are struggling to make a living, the young and the old on the two ends of the age spectrum are often left with insufficient material and spiritual care. Often the technology introduced to these desolate areas as a solution turns out to demand for resources beyond the means of the community and/or damage their physical environment. Specifically life threatening is the increasing desertification and famine in arid regions.

##### **Goal:**

To revitalise some communities in desolate areas, especially in desert or arid areas by providing technologies and introducing living arrangements with a production/trade structure that are appropriate to each community's geographic, ecological, cultural and economic setting and to reduce migration from the country to the cities.

##### **Approach:**

We offer a triad - **SEC** by [www.sure-tec.com](http://www.sure-tec.com) - as the means to achieve our goal:

**Sure-tec:** Low-cost and low-risk technologies that are appropriate for specific geographical, cultural and economical settings supporting the “subsidiarity” principle.

**Eco-bridge:** A production and trade structure that is environmentally not harmful, but just and economically viable.

**Caring-circle:** A living arrangement that enables the two ends of the age spectrum to meet each other's needs and the needs of those in the middle of the age spectrum.

##### **Main message**

**“Creating Self-sustaining, Cross-generational Communities in Desert Regions: Pilot Project Proposals”.**

1. ECOVILLAGE (ECOVILLA, 1988, Mendoza, Argentina)
2. DEREMOTOX (Russia, 1999).
3. SURE-TEC.COM (2000)

1. The first component of the triad is **Sure-tec**. It takes advantage of the desert environment, which is richly endowed with sunshine. **Sure-tec** harnesses this solar energy to provide the basic needs of clean water and electricity with low risk technology that can operate within the local environmental demand and the human and material resources with high resource efficiency (sustainability; conserving utilisation). Sure-tec also strongly supports “subsidiarity”. The term means more than help for self-help, namely also the shift of democratic decision authority to local, small communities. Subsidiarity is constitutive for the European Community.

2. The second component of the triad is **Eco-bridge**. It is based on the social setting provided by **Caring-circle** and supplies useable energy, water, soil, and air by means of **Sure-tec** as a livelihood the community, including the design of living space and the development of an economy. In both fields, indigenous ingenuity and entrepreneurial creativity are essential. Benefiting from **Sure-tec**, integrated planning and the resource-efficient (sustainable) use of regional materials and methods provide suitable housing and infrastructure. With the aid of information and management skills, the communal effort can give rise to the production of goods and services to meet the needs of the community. Basic bartering with other communities can lay the basis for future more developed commerce. **Eco-bridge** provides a test of the new concept of „**moderate, just and entrepreneurial house keeping**“ (optimal sustainable economy), a synergistic combination of the following socio-economic-ecologic concepts and activities:

- a) The entrepreneurial knowledge society (M. Miegel; [iwg.bonn@t-online.de](mailto:iwg.bonn@t-online.de) )
- b) The knowledge based political economy (F. Lehner & F. Schmidt-Bleek; [biofsb@wanadoo.fr](mailto:biofsb@wanadoo.fr) ; [mail@factor10-institute.org](mailto:mail@factor10-institute.org) ) ; <http://www.factor10.de> )
- c) The principles of natural capitalism (P. Hawken et al.; <http://www.rmi.org> )
- d) Defensible spaces ( O.Newman; <http://www.defensiblespace.com/start.htm> )
- e) A village project (M. G. Ritter; <http://www.a-7.de> )
- f) Solar cooking (K.-H. Weiler) <http://spot.fho-emen.de/hp/weiler/solar.html> and further development towards solar (reflector) water distillation – see chapter VI
- g) Climax greenhouse (G. Reisinger; [G.Reisinger@t-online.de](mailto:G.Reisinger@t-online.de) )
- h) Soil conditioning (J. U. Kügler; [ib.kuegler@t-online.de](mailto:ib.kuegler@t-online.de) )
- i) Phytotoxicological monitoring ( L. Weissflog; [lw@san.ufz.de](mailto:lw@san.ufz.de) )

3. The third component of the triad is the **Caring-circle**. It is a social setting that provides and nourishes human resources. It lets the young who need parental care and supervision, often orphans, live within or near senior citizen homes. This living arrangement energises the two ends of the age spectrum when they meet one another’s need in health, education and social interactions. Cultural values and skills can be transmitted in this congenial setting. Simultaneously, **Caring-circle** frees the most productive segment of the age spectrum to engage more fully in the management of the community and the production of goods and thus to counteract migration from the country to the cities.

The pilot project proposals were influenced by the successful activities of the August Hermann Francke Foundation founded in the 17<sup>th</sup> century and that of the present “Albert Schweitzer Familienwerk” (<http://www.albert-schweitzer.de> ).

### **Invitation**

The Sure-Tec Team right now consists of the authors and some further sure-tec partners. The team likes to invite other interested persons, groups, and institutions to participate in this project which has to be adapted to the local needs under the motto:

**Global thinking and local acting with an intercultural, interdisciplinary and intergenerational dialogue**

## **V. The CSE triad for reducing vital problems in South Africa a pilot project proposal**

C: Caring cycle, S: Sure-tec, E: Eco-bridge

First draft by G. K. Hartmann et al. (sure-tec.com team and South African Science Foundation) (August, 2002)

### **Remarks:**

In the meantime (Dec. 2003) it has become obvious that for a better support of the subsidiarity principle **the order of priorities should be changed from CSE to SEC**, i.e. that we should begin with the sure-tec technology – in the beginning fairly independent from eco-bridge and caring cycle. This finally led to the following pilot project proposal SRWD in chapter VI, however the text is given here in its original form.

### **Five major Problems in South Africa**

- 1. increasing lack of drinking water*
- 2. increasing desertification and growing desolate areas*
- 3. increasing number of unemployed younger people*
- 4. increasing migration from the country to the cities*
- 5. increasing contagious diseases*

**Remark:** As the technologically advanced nations are lifted by the tide of mercantile globalisation, there remain large pockets of populations, which do not benefit from the generation and flow of material wealth. In these desolate areas, while the population in their more productive years are struggling to make a living, the young and the old on the two ends of the age spectrum are often left with insufficient material and spiritual care. Often the technology introduced to these desolate areas as a solution turns out to demand for resources beyond the means of the community and/or damage their physical environment. Specifically life threatening is the increasing desertification, famine and the increasing lack of drinking water in arid regions.

### **Goal:**

To revitalise some communities in desolate areas, especially in desert or arid areas by providing – labour intensive - technologies and introducing living arrangements with a production/trade structure that are appropriate to each community's geographic, ecological, cultural and economic setting and thus to reduce migration from the country to the cities.

**Remark:** This will reduce at least the problems 1 to 4.

### **Approach:**

**Caring-circle:** A living arrangement that enables the two ends of the age spectrum to meet each other's needs and the needs of those in the middle of the age spectrum.

**Sure-tec:** Low-cost and low-risk - labour intensive - technologies that are appropriate for specific geographical, cultural and economical settings.

**Eco-bridge:** A production and trade structure that is environmentally not harmful, but just and economically viable.

The combination of the **CSE triad** for arid regions has been realised by [www.sure-tec.com](http://www.sure-tec.com) . It approaches the above goal and creates some “islands of hope”. The following three pilot project proposals have been the forerunners of [www.sure-tec.com](http://www.sure-tec.com)

*ECOVILLAGE (ECOVILLA, 1988, Mendoza, Argentina)*

*DEREMOTOX (Russia, 1999).*

*SURE-TEC.COM (2000)*

### **Main messages**

*a) Creating Self-sustaining, Cross-generational Communities in Desert Regions.*

*b) Global thinking, local acting - with an interdisciplinary, intercultural, and intergenerational dialogue, acknowledging the other and the subsidiary principle.*

### **CSE: (Caring Circle, Sure-tec, Eco-bridge)**

**1.** The first component of the triad is the **Caring-circle**. It is a social setting that provides and nourishes human resources. It lets the young who need parental care and supervision, often orphans, live within or near senior citizen homes. This living arrangement energises the two ends of the age spectrum when they meet one another's need in health, education and social interactions. Cultural values and skills can be transmitted in this congenial setting. Simultaneously, **Caring-circle** frees the most productive segment of the age spectrum to engage more fully in the management of the community and the production of goods and thus to counteract migration from the country to the cities.

**2.** The second component of the triad is **Sure-tec**. It takes advantage of the desert environment, which is richly endowed with sunshine. **Sure-tec** harnesses this solar energy to provide the basic needs of clean water and electricity with low risk technology that can operate within the local environmental demand and the human and material resources with high resource efficiency (sustainability).

**3.** The third component of the triad is **Eco-bridge**. It is based on the social setting provided by the **Caring-circle** and supplies useable energy, water, soil, and air by means of **Sure-tec** as a livelihood for the community, including the design of living space and the development of an economy. In both fields, indigenous ingenuity and entrepreneurial creativity are essential. Benefiting from **Sure-tec**, integrated planning and the resource-efficient (sustainable) use of regional materials and methods provide suitable housing and infrastructure. With the aid of information and management skills, the communal effort can give rise to the production of goods and services to meet the needs of the community. Basic bartering with other communities can lay the basis for future more developed commerce. **Eco-bridge** can provide a test of the new concept of „**moderate, just and entrepreneurial house keeping**“ (optimal sustainable economy), a synergistic combination of the following socio-economic-ecologic concepts and activities:

The entrepreneurial knowledge society (M. Miegel; [iwg.bonn@t-online.de](mailto:iwg.bonn@t-online.de) )

The knowledge based political economy (F. Lehner & F. Schmidt-Bleek; [Biofsb@aol.com](mailto:Biofsb@aol.com) )

The principles of natural capitalism (P. Hawken et al.; <http://www.rmi.org> )

Defensible spaces ( O.Newman; <http://www.defensiblespace.com/start.htm> )

A village project (M. G. Ritter; <http://www.rai-berlin.de/> )

Solar cooking, water sterilisation (K.-H. Weiler; <http://spot.fho-emden.de/hp/weiler/>)

Climax greenhouse (G. Reisinger; [G.Reisinger@t-online.de](mailto:G.Reisinger@t-online.de) )

Soil conditioning (J. U. Kügler; [jb.kuegler@t-online.de](mailto:jb.kuegler@t-online.de))

Phytotoxicological monitoring ( L. Weissflog; [lw@theo.uoe.ufz.de](mailto:lw@theo.uoe.ufz.de) )

## **VI. Solar Reflector Water Distillation (SRWD) in the Sonora Desert for the Tohono O'odham and other indigenous people. A pilot project proposal**

**G. K. Hartmann, H-G. Flepp, K. C. Hsieh et al.<sup>2</sup>**

First draft March 2003, updated in October 2003

### **Purpose:**

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<sup>2</sup> Mitglieder des **Sure-Tec.Com Team**: [gkhartmann@web.de](mailto:gkhartmann@web.de) ; H-G. Flepp: [bestadvice@bluewin.ch](mailto:bestadvice@bluewin.ch) ; K.C. Hsieh: [hsieh@dakotacom.net](mailto:hsieh@dakotacom.net);

To provide technical and material assistance to the Sonoran O'odham and other indigenous people and to the Buquivaba Clinic in Magdalena de Kino, Mexico; and in return, receive knowledge of healing methods of the indigenous people of Mexico. The exchange is based on barter.

Remark: After two visits in Tucson, Arizona (Nov. 2001 and February 2003) and intensive discussions with friends, colleagues, Tohono O'odham indigenous people of the Sonoran Desert, and after further discussions with the sure-tec.com team members in Europe the pilot project has been drafted and structured in three parts, so that fund-raising and support can be channelled in a less complicated (unbureaucratic) manner:

#### Part I

Optimisation of the already existing and successfully implemented two prototypes of a Solar Reflector Cooker (SRC) with automatic solar tracking for the use as water destillator and the adaptation to the conditions in the Sonora Desert. Technical lead: Prof. Dr. K.-H. Weiler, University Emden together with University of Arizona (UA) at Tucson and/or or a university in Mexico, further with the Sure-Tec.Com Team (Europe) and "ECCO" at Tucson (William "Sky" Crosby) – negotiations have been started.

#### *Remark*

During sunshine the small SRC has an output of about 1.3 kW, the big SRC about 3 kW.

#### Part II

Assembling a small and/or a big SRC at the ranch of Wenceslao Monroy at Magdalena de Kino in Mexico - provided that the technical conditions are sufficient - to be used in Obregon and/or at the Buquivaba Clinic. Technical lead: Prof. Dr. K.-H. Weiler and relevant engineer(s). Further co-operating partners: The Sonora Traditional Indian Council (Magdalena de Kino), the O'odham Communities Human Rights Foundation (Tucson) – both tax exempt institutions and represented by their project co-ordinator, Ron Rosenberg (Buquivaba Clinic [buquivaba@hotmail.com](mailto:buquivaba@hotmail.com)), the Sure-Tec.Com Team (Dr. G. K. Hartmann (PI), St. Michael & All Angels Episcopal Church, Tucson, (Prof. Dr. K. C. Hsieh et al.), ECCO (William Crosby), Garth and others – like doctors for Global health. Negotiations for a possible partnership with the Mexican University of Sonora DICTUS have been positively started through Ron Rosenberg with Rafael E. Cabinillas.

*(To be completed and/or corrected by Ron Rosenberg and partners in Magdalena and Tucson as well as in Europe in the course of the year 2003)*

#### Part III

Test of a small – 2 to 3 square meter - solar water destillator, a high tech prototype device by BSR Solar Technologies GmbH in Loerrach, Germany, likely accompanied by a low temperature prototype solar stirling water pump. (To be corrected and complemented by BSR in the course of the year 2003)

#### *Remark:*

*Fund-raising and material support can or should be done separately for each part.*

### **VII. CV of the author**

Gerd Karlheinz Hartmann (Dr., Prof.), born in 1937 in Eschwege, Germany, studied physics from 1957 to 1964 at the Georg-August-University in Göttingen, where he received his PhD. in 1967.

Since 1965 he has worked as a scientist at the Max-Planck-Institut für Aeronomie, D-37191 Katlenburg-Lindau. For over ten years he concentrated his activities on studying the upper atmosphere using satellite (radio) beacon signals.

Since 1967 he has been dealing also with general and specialised information and documentation problems, from the viewpoint of large volumes of time dependent and space dependent data, especially of the type collected in his research projects. At present he works as a consultant on several national and international committees and holds lectures and seminars throughout Europe, and especially in the USA., in Argentina, and Chile, countries he has often visited in the course of his scientific projects.

From 1975 to 1978 he was the provisional director of a division of the institute, the Institute for Long-term Control of Geophysical Environmental Conditions (ILKGU).

Since 1979 his main area of specialisation has been studying the lower atmosphere by means of microwave radiometry. He is the Principal Investigator of the Millimeter Wave Atmospheric Sounder (MAS) experiment which as a joint enterprise of Germany, Switzerland, and the USA (<http://www.linmpi.mpg.de/english/projekte/masnew> ) has been flown as core payload of the NASA ATLAS (Atmospheric Laboratory for Applications and Science) Space Shuttle Missions (ATLAS-1 (1992), ATLAS-2 (1993), ATLAS-3 (1994);

Since 1980 he has been "consultant" for information problems of the Institute of Intercultural Cooperation/Intercultural Research" (ICC/IIR: Heidelberg/Zürich/Pernegg). In the 80ties he travelled on behalf of that institute to India and Asia, especially for discussing his concept of the (intercultural) information system OCIR/VIGRODOS. He participated in and contributed to international conferences on problems of intercultural understanding and co-operation.

1986 he became guest professor and guest lecturer for filter and information theory at the University of Mendoza, Argentina. This task was extended in 1988, now also including problems of conserving utilization of the environment (sustainable development). In this context he is the international co-ordinator of the environmental program PRIDEMA started by the University of Mendoza (UM) in 1988.

1991 he became full professor at the engineering faculty of UM for "remote sensing for a conserving utilization of the environment" (sustainable development) and also "external scientific director of the institute for environmental studies (IEMA) of UM. In December 1991 he received the Dr. Luis Federico Leloir Award for international co-operation with Argentina in the domain of environmental research from the Argentinean minister for Science and Technology, Prof. Dr. R.F. Matera.

Since 1995 he has worked on the "value added validation" of remote sensing data from the Earth's atmosphere resulting in the "DUST-2 CD ROM" and in the "MAS/GRAS follow-on proposal". He was the manager of an international experiment proposal for the investigation of the MARS atmosphere - in context with the MARS EXPRESS Mission of the European Space Agency (ESA) -, till it was cancelled because of funding problems in summer 1999.

In 2001 and 2002 he continued - as a pensioner - at MP Ae the DUST-2 activities, the related ADLATUS for schools pilot project proposal, and the activities that have been started in Mendoza. Since 2001 he works also as honorary consultant for science and technology for the German-Islamic Institute for Scientific and Cultural co-operation e.V., in Celle).

Since January 2003 he works - as honorary consultant for science and technology - for Science-softCon, Maintal, Germany, and for BSR Solar Technologies GmbH, in Loerrach, Germany.

Since 1965 he is married with Marianne Hartmann, (Panke). His hobbies: music, philosophy, intercultural co-operation. He has the ham call DK5AV.

Addresses:

1. Dr. G. K. Hartmann, Science-softCon, Auf der Burg 4 63477 Maintal, Germany, [www.science-softcon.de](http://www.science-softcon.de) ; Email: [gkhartmann@web.de](mailto:gkhartmann@web.de); <http://www.science-softcon.de/gkhartmann/index.html> ; <http://www.sure-tec.com> .
2. Prof. Dr. G. K. Hartmann, Universidad de Mendoza (UM), IEMA, Perito Moreno 2397, 5501 Godoy Cruz, Mendoza, Argentina, Tel: +54 -261 -4392939 / 4200740, Fax: +54-261-4392939; [enrique.puliafito@um.edu.ar](mailto:enrique.puliafito@um.edu.ar)