

QUESTIONS 39 TO 43

<p>QUESTIONS/COMMENTS FROM SUSAN BOEHM, CARNARVON:</p>	<p>INPUTS FROM VARIOUS EXPERTS INVOLVED IN THE STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE SKA PHASE 1 IN SOUTH AFRICA:</p>
<p>39 (part 1). Growing scientific concern about the effects of very large solar farms on local climates and wildlife is now revealed on the Internet. Whilst solar energy seems beneficial in its carbon footprint, there is an effect on the thermal environment. Nearby populations of humans and other species are affected.</p> <p>Researchers Turney and Fthenakis have posted extended research in this regard, www.clca.columbia.edu/analysis of the potential for a heat island effect in large solar farms.</p> <p>Also www.weather.com/solar energy contributes to climate change. or www.wattsupwiththat.com , www.telegraph.co.uk</p> <p>www.sanfrancisco.cbslocal.com posted an article on the 18 August 2014, "Birds Bursting into flames above solar farm. Stirs calls to slow expansion"</p> <p>41. The "burning" issue addressed in www.sanfrancisco.cbslocal.com is heat reflection in the immediate area above the solar panels. The birds are burnt to death during flight, as they fly across the desert immediately above the solar</p>	<p><u>Regarding the "Birds Bursting into flames above solar farm " and the "heat island effect":</u></p> <ul style="list-style-type: none"> Inputs from Dr Simon Todd (Scientist: SAEON Arid Lands Node) and Dr Joh R Henschel (Manager: SAEON Arid Lands Node) from the South African Environmental Observation Network: <p>The "http://www.clca.columbia.edu/" is the single original source indicated in question 39. The other links are secondary sources (i.e. www.weather.com/solar energy contributes to climate change. or www.wattsupwiththat.com , www.telegraph.co.uk) which are not reliable and should not be used to support any arguments. Take for example www.wattsupwiththat.com, which Wikipedia says "promotes climate change denial". These views are counter the accepted scientific opinion and as such can only be supported by opinion and not evidence.</p> <p>The research of Turney and Fthenakis: "Turney D. and Fthenakis V., Environmental Impact from Installation and Operation of Large-Scale Power Plants, Renewable and Sustainable Energy Reviews, 15, 3261-3270, 2011" demonstrates that "None of the impacts are negative relative to traditional power generation. We rank the impacts in terms of priority, and find all the high-priority impacts to be beneficial."</p> <p>The article "Birds Bursting Into Flames Above Solar Farm Stirs Calls To Slow Expansion published on August 18, 2014 11:25 AM on the website http://sanfrancisco.cbslocal.com/ is about solar CSP and not solar photovoltaic : "More than 300,000 mirrors, each the size of a garage door, reflect solar rays onto three boiler towers each looming up to 40 stories high. The water inside is heated to produce steam, which turns turbines that generate enough electricity for 140,000 homes."</p> <p>CSP plants and Solar PV plants are not the same and do not have the same effects. It is true that Concentrated Solar Power (CSP) plants, which use large parabolic mirrors to reflect heat onto a central tower can impact avifauna as well as invertebrates, this is not true of Solar PV plants. These plants consist of standard solar panels that do not purposely reflect light or heat. Such solar panels attempt to absorb as much of the light as possible so that it can be converted to electrical energy. Heating of the panels decreases efficiency and so makers of these panels try to prevent them from heating up as much as possible. The temperature above a solar PV field is less than 2°C higher than ambient, which is not a lot and certainly would not have a negative effect on any fauna. In addition, normal Solar PV panels are not very shiny and do not attract insects.</p> <p>Re. the comment "<i>telescope dishes will reflect during the day and at night</i>", it is important to recognise that an object can only reflect what it receives and so at night, it is dark and so very little can be reflected at all. Reflected moonlight would not generate a climate warming effect. Sola PV or CSP panels do not equate telescope dishes. The physical properties of the different</p>

panels. It is so extreme that it almost sounds unbelievable.

But other reports also refer to this "heat" problem, such as talkingpointsmemo.com and natureworldnews.com . Hot air above panels could easily be warmer than the surrounding air by 1.9 degrees centigrade, or more. What about telescope dishes? Could they warm up the air above or nearby?

The large white convex telescope dishes proposed to create the SKA phases 1, 2 and 3 expanding across the Central Karoo Area, would reflect heat by day and night.

Perhaps reflections from dishes would not be as intense as heat reflected from solar panels. Which micro climate changes could result from increased heat reflection? How much hotter and drier would the air in our environment become with thousands of dishes in the area?

41.1. How likely is the potential for a "heat island effect" near densely placed dishes?

41.2 If so, how could air velocity and moisture content be affected in the immediate and surrounding areas?

41.3. How would the dishes influence temperatures, and rainfall in

technologies are not the same. The telescope dishes are white and will lower the albedo of the earth and will in fact cause a cooling and not a warming effect. However and perhaps most importantly, it is worth considering the potential extent of the effect. A single commercial-scale Solar PV Plant occupies around 200ha about half of which is Solar PV panels. In other words a single Solar PV plant consists of about 80-100ha of panel surface. To calculate the area covered by dishes in the SKA, we need to know the area of each dish and the number of dishes. In the most concentrated area, there are 80 dishes depending on how you define it. There are 197 in total in South Africa for the whole SKA Phase 1 project but this is across a very large area. Considering the core area only, each dish is 15m in diameter, which means that it has an area of about 176.7m² and the 80 dishes from Phase 1 will then have a total area of 14137m² which sounds like a lot, but this is only 1.41ha! So this is less than 2% the area of a single Solar PV plant. Therefore, even if the telescopes had an effect it would be negligible and certainly not sufficient to generate any significant impacts. The addition of further phases will still not approach the surface area of a single PV plant. Ultimately, the surface area of all the dishes of all the phases of the SKA would be 100ha, but this is spread across thousands of square kilometres and would not have the ability to generate a significant climate changing effect. Still, even though the probably minor effect of each dish in terms of thermal & light reflectance would be extremely diluted, spread over such a vast area, it is a point to investigate at a dish, but the feared effects are unlikely. All of that is conjecture and it is important to do research, but these are not the first radio telescopes being installed in the world (e.g. the VLA in USA and SKA-counterpart in Australia): <http://www.vla.nrao.edu/>, <http://www.ska.gov.au>

- **Inputs from Margaret Kieser and Roger Price from the Agricultural Research Council (ARC) – Plan Protection Research:**

We understand that this is a radio telescope site and nothing to do with a solar farm, so the concerns about thermal pollution are not valid.

- **Inputs from Andries Kruger, Chief Scientist: South African Weather Service specialising in historical climate change and variability, from the South African Weather Services:**

Few studies have been done on the micro-climatic effects of solar panels, however, the following comprehensive study: http://www.clca.columbia.edu/13_39th%20IEEE%20PVSC_%20VMF_YY_Heat%20Island%20Effect.pdf of an approximately 2km x 2km 1MW solar farm, demonstrates that for such a farm the climate 300m away will be approximately the same as the surrounding environment and that the temperature above the farm can reach 2 degrees Celsius higher than the surrounds 5 – 18 m aloft during daytime. However, this difference diminishes at night. Therefore it will be unlikely for a heat island effect to develop.

immediate areas or in the Northern Cape?

41.4. Such changes would radically alter the natural environment and affect millions of animals and plants. How detrimental could such effects be on our flora and fauna?

41.5. Would temperature changes and more dryness affect the animals health, immune systems and their fertility?

41.6. Could certain plant species disappear completely?

41.7. Could all of this lead to desertification?

- **Inputs from Lydia Cape (Pri.Sci.Nat.), Project manager and Environmental Scientist at the Council for Scientific and Industrial Research (CSIR):**

The article referred to on www.sanfrancisco.cbslocal.com refers to CSP technology and not photovoltaic technology. Photovoltaic (PV) solar panels are designed to absorb sunlight in order to convert it into electricity. The monocrystalline silicon solar cells composing the PV panels absorb two-thirds of the sunlight reaching the panel's surface and therefore only a third of the sunlight reaching the surface of a solar panel has a chance to be reflected. It should also be noted that innovative technology such as an anti-reflective coating or glass placed on the surface of the panel can reduce the sunlight that is reflected and increase the amount of sunlight that is absorbed. Most solar panels are now designed with at least one anti-reflective layer and some panels have multiple layers. These measures further reduce reflectivity. This statement is confirmed by several scientific and industrial studies, among which:

- the study by Stephen P. Shea Ph.D., "Evaluation of Glare Potential for Photovoltaic Installations August, 2012" (Glare Potential Evaluations - Suniva, Inc. - August 2012, Page 8): *"The vast majority of PV panels have a front surface made of glass. As far as reflection is concerned, PV panels behave much like building facades; skylights; automobile windshields and other common glass surfaces, as well as the water (or ice) surfaces of ponds and swimming pools. In many designs, appropriate siting and orientation of the PV array can prevent any glare from reaching sensitive areas. In these cases, the magnitude of the reflected light from the array is irrelevant, and design approval should be straightforward"*.
- the study by Mark Shields, "PV Systems: Low Levels of Glare and Reflectance vs. Surrounding Environment", (Sunpower, 2010): *"Since the whole concept of efficient solar power is to absorb as much light as possible while reflecting as little light as possible, standard solar panels use "high-transmission low-iron" glass and produce less glare and reflectance than standard window glass. The possible glare and reflectance from PV systems are at safe levels and are decisively lower than other standard residential and commercial reflective surfaces"*. (Source: Mark Shields 2010, PV Systems: Low Levels of Glare and Reflectance vs. Surrounding Environment, Sunpower.)
- the study by M. Donovan, "Memorandum: impact of PV systems on local temperature" (SunPower, July 2010), evaluated *"the potential effects of the presence of solar arrays on local temperatures to address concerns that the presence of these arrays might substantially alter temperatures, thus altering microclimates and affecting vegetation and wildlife species"*. The study determined that *"the introduction of a tracking PV system decreased the albedo of the study area from 29% to 27% which results in the increase of the amount of solar energy absorbed as heat from 14.9 MWh/acre/day to 15.3 MWh/acre/day. Such a small change is not expected to have a substantial effect on vegetation or wildlife."* Furthermore, considering the heat island effect, the study demonstrated that *"the PV array will absorb slightly more heat than a field with no PV, PV panels dissipate heat quickly while earth and concrete dissipate heat slowly, and relative to the energy loads in an urban area, the energy loads in a PV plant are about 250 times smaller per acre, suggesting that waste heat from energy loads is not a significant source of heating in a PV array."* In the

study, Donovan concluded that “the area under, above, and around the solar field will not experience a net heating impact, or a substantial cooling impact.”

39 (part 2). The bright reflections radiating from the solar panels attract a huge amount of insects.

Solar panels only reflect during the day, but not at night. Big white concave telescope dishes will reflect during the day and at night, throughout the year.

The proposed SKA core area could arguably become a large breeding ground for disease carrying insects. The CSIR must urgently include research on epidemic outbreaks of insects and the possible spread of disease as a result.

39.1. How would the immediate neighbours, local farmers and adjacent communities be affected by insects due to SKA phase 1?

39.2. How would the Central Karoo AAA and the North Cape, be affected by phases 1, 2 and 3 due to insect plagues?

39.3. What could short and long term losses be regarding vaccination programs, veterinary intervention, stock losses and/or loss of organic-product status?

39.5. Which health implications face the human population?

Regarding the “epidemic outbreaks of insects and the possible spread of disease”:

• Inputs from Margaret Kieser and Roger Price from the Agricultural Research Council (ARC) – Plan Protection Research:

It is well known that insects are attracted to light sources at night. We are unsure whether insects will be attracted to large white telescope dishes shining in the moonlight. The SKA area ‘could’ become a source of outbreaks for the brown locust (*Locustana pardalina*) which is endemic to the Karoo area. With the removal of resident farmers, the locust reporting network could break down and lead to outbreaks being undetected. Such outbreaks could feasibly infest surrounding neighbours and adjacent farms. The most serious problem insect is the brown locust, and community tension and concerns would arise that the SKA area could become an infamous breeding ground for this locust, unless monitored and controlled. Our experience in the Karoo shows that insect-borne diseases of stock animals and probably humans only occur during exceptionally wet years when standing water lies in the veld for weeks on end. However this will have nothing to do with the SKA infrastructure, but is something to recognise during La Nina years.

• Inputs from Dr Simon Todd (Scientist: SAEON Arid Lands Node) and Dr Joh R Henschel (Manager: SAEON Arid Lands Node) from the South African Environmental Observation Network:

If the SKA team intends to shut down most of the farming infrastructure in the core of the SKA Phase 1 then there will be less opportunities for insects breeding on the SKA site compared to the surrounding farms. Therefore, the SKA should serve as a buffer against rift valley rather than a source. Apart from those associated with mosquitos, we are not aware of other insect-borne diseases in the area. Ticks are not insects, but rather more closely allied with spiders and similar arguments hold here as to the lack of a potential effect related to temperature increases or any other effect. The SKA does not need to have operating water troughs and tanks for livestock so mosquito populations on the SKA site should be lower than on surrounding farmland where there are lots of water troughs, tanks and dams all of which are good breeding habitat for mosquitos. Insects as a group are regarded as pests, although they are key ecosystem service providers (if one were to obliterate all insects in the Karoo, all farmers would very soon be bankrupt, that is a guarantee, so they should be extremely glad and grateful for having insects on their farms, including locusts, and should do everything to promote their well-fare). It would be interesting to monitor changes in insect populations (among other animals) during the operation of the SKA project but this cannot be done universally, i.e. just any taxa, as that is not a menial task (75% of all known species on Earth, including all habitats both terrestrial and marine, are insects – so it’s a daunting task just to say “monitor insects”). It is likely that the number of flies and mosquitos would decline at SKA, the first because of less dung, the second because of less surface water. With the removal of sheep, it may be that the tick population declines.

As an example one could look at the losses farmers suffered in recent years due to Rift Valley Fever outbreaks. Once there is an outbreak, the disease spreads rapidly across the country, the available vaccines are insufficient to cover a huge demand and once the vaccine is administered it takes up to three weeks before stock is protected. Some farmers lost all their stock.

- **Inputs from Sue Milton-Dean from the RENU-KAROO Veld Restoration cc:**

If the insect plagues that the writer had in mind are locusts, ruspers, or ticks – these all have their natural controls and are part of the system – bustards, storks, korhaans. Tick populations are unlikely to build up to dangerous levels given the low natural density of wildlife in the area. Moreover, if there are no livestock in the area they will not come into much contact with the wildlife.

- **Inputs from Lydia Cape (Pri.Sci.Nat.), Project manager and Environmental Scientist at the Council for Scientific and Industrial Research (CSIR):**

There is no priority concern in terms of insects' outbreaks which would require the specialised assessment of an entomologist in the study area at this stage, however, long term monitoring and prevention measures will be included in the Integrated Management Plan for the SKA Phase 1 SA project. Further discussion will be held with SAEON with respect to the long term monitoring and research programme at the SKA site.

According to the U.S. Department of Health & Human Services' Centers for Disease Control and Prevention, *"the Rift Valley fever (RVF) is an acute, fever-causing viral disease most commonly observed in domesticated animals (such as cattle, buffalo, sheep, goats, and camels), with the ability to infect and cause illness in humans. The disease is caused by RVF virus (RVFV), a member of the genus Phlebovirus in the familyBunyaviridae. It was first reported in livestock by veterinary officers in Kenya's Rift Valley in the early 1910s. In 2010 and 2011, South Africa's National Institute of Communicable Diseases (NICD) informed CDC of an ongoing outbreak of Rift Valley Fever affecting both animals and humans in South Africa. Humans can be infected with Rift Valley Fever (RVF) from bites of infected mosquitoes and, rarely, from other biting insects that have virus-contaminated mouthparts. More commonly, humans are infected after exposure to blood, body fluids, or tissues of RVF-infected animals. This direct exposure to infected animals can occur during slaughter or through veterinary and obstetric procedures. No human-to-human transmission has been documented. Environmental factors, particularly rainfall, seem to be an important risk factor for outbreaks: epizootic events and outbreaks in humans have been observed during years in which unusually heavy rainfall and localized flooding occur. RVF outbreaks thus usually occur in areas with high rainfall which is linked to an over-abundance of mosquitoes which is not specific to the climate of the Karoo. In high rainfall area, the agricultural fields are flooded by rainwater, forming field dams for future irrigation. These field dams are also a good habitat for mosquito breeding. RVF is associated with the presence of water bodies on the land. In the case of the SKA site, assuming that the SKA's policy is in fact to close down boreholes and drinking facilities on the study area, this will reduce the presence of water bodies on the land and therefore the potential for good habitat for mosquito breeding. RVF control programmes should be directed towards monitoring and surveillance, restriction of animal movements and vaccination."*

The theory of Edward O. Wilson, distinguished biologist at Harvard University, is that *"if we were to wipe out insects alone...on this planet, which we are trying hard to do, the rest of life and humanity with it would mostly disappear from the land and within a few months."*

	<p>John R. Meyer's General Entomology course at North Carolina State University provides valuable information on the importance of insects for the survival of human life on earth. <i>"Insects are found in virtually every terrestrial and fresh-water environment on the face of the earth".</i> On the one hand, insects <i>"have a direct impact on agricultural food production by chewing the leaves of crop plants, sucking out plant juices, boring within the roots, stems or leaves, and spreading plant pathogens. They feed on natural fibers, destroy wooden building materials, ruin stored grain, and accelerate the process of decay. They also have a profound impact on the health of humans and domestic animals by causing annoyance, inflicting bites and stings, and transmitting disease. Economic impact of insects is measured not only by the market value of products they destroy and the cost of damage they inflict but also by the money and resources expended on prevention and control of pest outbreaks."</i> On the other hand, <i>"as consumers, scavengers, and decomposers, insects play a vital role in the biogeochemical cycling of nutrients. Insects help aerate the soil, improve its retention of rainwater, and enhance its tilth. They turn more soil than earthworms and redistribute nutrients within the root zone as they burrow and nest in the ground. Flies and dung beetles prevent the build-up of manure from large animals and speed up its decomposition by fungi and bacteria. But above all else, insects play an essential role as pollinators of flowering plants (angiosperms). These plants are dominant producers in many terrestrial ecosystems, but they cannot reproduce without insect intermediaries to carry pollen (the male gametophyte) from flower to flower. Many of our agricultural crops like almonds, apples, cherries, blueberries, cucumbers, squash, melons, etc. would be non-productive without insect pollinators."</i></p>
<p>39 (part 3). SKA phases 1, 2 and 3 are suggested to boast 3000 dishes or more, with half of these situated in the core area, and the other half spiralling across the central part of the Northern Cape. Affecting the heartland, where lamb of the highest quality and most reputable "Meat of Origin, Karoo" brand is organically produced. And, where a high quality of wool is produced. The Northern Cape is the fourth largest wool producer in South Africa. And 25 % of all South Africa's sheep are found in the Northern Cape, according to SA livestock numbers, August 2015.</p> <p>39.4. Downgrading local lamb due to the loss of organic status, would affect</p>	<p><u>Regarding the impacts on the "Meat of Origin, Karoo" brand:</u></p> <p>Prof Johann Kirsten, Head of the Department of Agricultural Economics: Extension and Rural Development of the University of Pretoria and chairperson of the Karoo Development Foundation, is part of the CSIR expert team for the SEA.</p> <p>Based on his current work with Karoo Lamb and the engagement with local abattoirs in the study area for the SEA, Prof Johann Kirsten will analyse:</p> <ul style="list-style-type: none"> • The livelihoods impact of the relocation of farmers and farm workers. Can farmers start a new business? • The impacts on meat production in the Bo-Karoo on the future of the abattoirs and their workers. • Impact on tourism - both negative and positive • Impact of communication restriction on farmers' businesses <p>The core aspect to be investigated is the economic multiplier impact as a result of the potential loss of productive land and the impact on local businesses and the abattoirs.</p>

<p>farmers, abattoirs, the SA meat industry and consumers alike. How would such losses be calculated?</p>	
<p>40. Will SKA make an allowance to compensate for such extreme and devastating scenarios in their budget, or carry appropriate insurances?</p>	<p>The question has been forwarded to the SKA team for their answer.</p>
<p>42. A further issue of great concern, also among wildlife protection activists, is SKA's policy of closing down boreholes and drinking facilities available to animals in the wild. This practice has been implemented on the two farms SKA already owns.</p> <p>SKA have stated that all drinking facilities will be shut down on the additional 36 farms they intend to buy for SKA phase 1.</p> <p>The total area will be fenced in trapping many animal species to suffer thirst and die slowly.</p> <p>Will the natural food chain rapidly collapse? Will the ecosystems suffer a blow on a scale never seen in the Karoo before?</p> <p>Which of our valued, protected or endangered species will survive? Which won't?</p>	<ul style="list-style-type: none"> • Inputs from Sue Milton-Dean from the RENU-KAROO Veld Restoration cc: <p>The animals that belong in the central Karoo use very little drinking water, getting their needs from their food (prey animals, fruit or leaves). It could be that extraction of borehole water of the past century has reduced flow of fonteine in river beds. If this was the case, removal of pumps should result in improved water flow in such sources as river seeps. Something to include in research Simon.</p> <ul style="list-style-type: none"> • Inputs from Dr Simon Todd (Scientist: SAEON Arid Lands Node) and Dr Joh R Henschel (Manager: SAEON Arid Lands Node) from the South African Environmental Observation Network: <p>One should ask the farmers/concerned citizens back as to what they think the animals were drinking before farmers got there? Putting water troughs all over the place turns the system into an unnatural one and closing them down again is in effect reverting the system back towards a more natural system. In these arid areas most animals will drink water if it is there, but most can also do without water. Most likely, the only mammals in that area that require water to survive are Baboons. Their distribution has expanded greatly as a result of water provision by humans and historically they did not occur in areas without water. There are numerous natural water sources available in the area for the animals that need these. SAEON has the intention of monitoring those potential impacts and the use of water points by animals. This type of study might for example compare two areas, one with watering points and the other without to compare faunal abundance and composition.</p> <ul style="list-style-type: none"> • Inputs from Lydia Cape (Pri.Sci.Nat.), Project manager and Environmental Scientist at the Council for Scientific and Industrial Research (CSIR): <p>An assessment of freshwater aquatic ecology sensitivities within the SKA study area will be undertaken by experts from the freshwater consulting group, with inputs from Dr. Wietsche Roets Pr.Sci.Nat., Specialist Scientist: In-stream Water Use at the Department of Water and Sanitation (DWS). Aquatic habitats are of high conservation importance because water is a scarce resource in the Karoo and because damage to such habits has downstream implications (reduced quality of ground water, siltation of dams, loss of key resources for wildlife both on and off site). The assessment will take place assuming that the land</p>

	<p>owners of the farms located within the core of the SKA site and the 3 spiral arms allow the SEA specialists to go onto their farms beginning of March to assess the potential impacts of the SKA project. The assessment will develop a spatial database of surface freshwater ecosystems and their buffers with a sufficiently high confidence level, which can be used to place SKA infrastructure in order to minimize impact and regulatory requirements. The impacts associated with the placement, construction and operation of the SKA antennas and infrastructure will be assessed according to the criteria detailed in the NEMA Regulations (2014) and the DWS's risk assessment matrix.</p> <p>SKA SA has also commissioned a geohydrological study as part of the construction planning to look at existing boreholes in the areas where construction is being planned, to see what the water table looks like. It all forms part of the information SKA SA has to submit to the department of Water Affairs so that SKA SA can obtain a water licence in order to undertake construction in the specific areas.</p> <p>To our knowledge it is not planned that the total area of the SKA project will be fenced in. The core of the SKA Phase 1 which will include 38 farms in total should not be fenced in. This will be specified in the Integrated Management Plan for the SKA Phase 1 SA project and further discussion will be held with the Protected Area Unit of the Department of Environmental Affairs to investigate this matter. In terms of ecosystems and protected or endangered species, an assessment of terrestrial ecology sensitivities within the SKA study area will be undertaken by experts from the Renu-Karoo Veld Restoration cc, with inputs from the South African Environmental Observation Network (SAEON), the Endangered Wildlife Trust (EWT) and the South African National Biodiversity Institute (SANBI). The assessment will take place assuming that the land owners of the farms located within the core of the SKA site and the 3 spiral arms allow the SEA specialists to go onto their farms beginning of March to assess the potential impacts of the SKA project. The assessment will focus on features of high sensitivity within the SKA study area such as biodiversity hotspots; habitats critical for persistence of threatened, rare and locally endemic plant and animal species; and natural corridors for the movement of plant seeds and animals between biomes and habitats. The terrestrial ecology assessment will describe the impacts and risks associated with the various SKA activities and infrastructures (antennas, roads, cable trenches, etc) on the environment and in particular on ecological features, fauna and flora of interest. Cumulative impacts and effects of mitigation actions on impacts will also be considered.</p>
<p>43. How could we trust that SKA SA will look after such a huge piece of land appropriately? Our local community has witnessed SKA policies causing great imbalances in the natural environment so far, and does not trust the road SKA might follow going forward.</p>	<ul style="list-style-type: none"> • Inputs from Lydia Cape (Pri.Sci.Nat.), Project manager and Environmental Scientist at the Council for Scientific and Industrial Research (CSIR): <p>The integrated management plan (IMP) for the SKA Phase 1 resulting from the SEA process will provide recommendations on procedures for mitigating and monitoring environmental impacts associated with the proposed activity based on the specialists assessments and fieldwork to be conducted beginning March 2016. The IMP will also include relevant programmes and permitting requirements associated with the proposed activity such as alien invasive management programme, a protected areas management programme and a long term research programme amongst others. The IMP document should be used throughout the project life cycle, and therefore it should be regularly updated to remain aligned with the project as it progresses from construction to operation and, finally to decommissioning.</p>

Which other impacts, such as erosion for instance, might occur and influence neighbouring farms, should SKA SA continue to neglect environmental issues, as it has done up to now?

It is clear that the future and the treasures of the Karoo need urgent protection.

- **Inputs from Dr Coetzee, Specialist Scientist at the Council for Geosciences of South Africa:**

Any new built infrastructure has the potential to cause or accelerate soil erosion at all phases of development. Critical phases where erosion can be expected would include:

1. Site establishment, where vegetation is often cleared, land is levelled; roads and other infrastructure are developed and so on. Many of these developments are seen as temporary and so their potential impacts may be ignored.
2. Construction, particularly where excavation is taking place and where vehicular traffic increases.
3. Operation, if the erosion impact of the new development and related infrastructure are not well understood and any erosion which does occur is not mitigated.
4. Decommissioning, if anticipated, where little care is often taken for the impact of the demolition of structures.

Luckily these impacts are relatively simple to manage, if the following is taken into account.

1. All designs should be sensitive to local conditions. In particular, rainfall in the SKA area tends to be low and episodic. Designs need to allow for long periods with no rain as well as short storms.
2. The impact is likely to extend beyond the SKA structures themselves. Access roads are often problematic with respect to erosion, particularly where stormwater management measures are not appropriate for infrequent events with high rainfall intensity. Designs need to take both total rainfall and expected peak rainfall intensity into account.
3. Monitoring systems need to be in place to identify erosion in its early stages where mitigation and rehabilitation is generally simple and affordable. This means that soil erosion needs to be incorporated into operational risk management and environmental monitoring procedures.

Equally important these measures need to be clearly communicated with stakeholders. For often subtle impacts, such as the early stages of soil erosion, local stakeholders can often make an important contribution to the implementation of an operational monitoring strategy.

- **Inputs from Johann Lanz (Pri.Sci.Nat.), Soil Scientist:**

Erosion is a much localised phenomenon and cannot really spread (except downstream in the case of huge scale flooding, which is not likely to happen in the SKA area). So if there were cases of erosion taking place in the SKA area, this would not impact neighbouring farms. Erosion would be much localised to places of impact, such as roads where erosion control would have been lacking. It is therefore unlikely that any danger or wide scale erosion would occur on the SEA study area due to the SKA project.