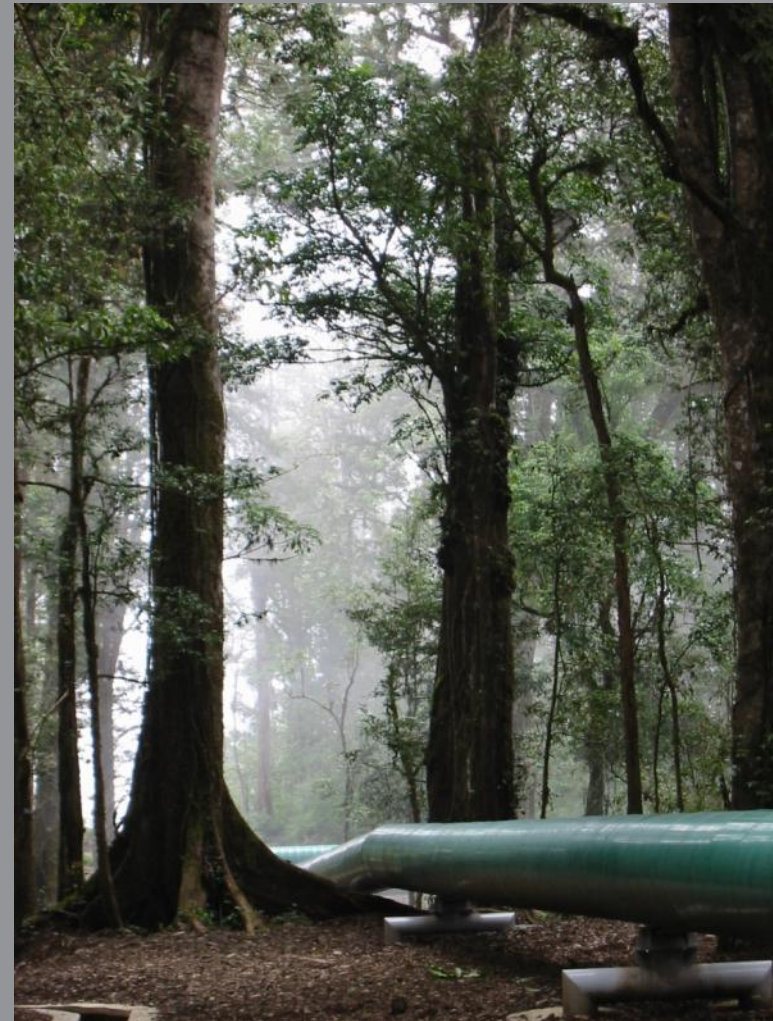


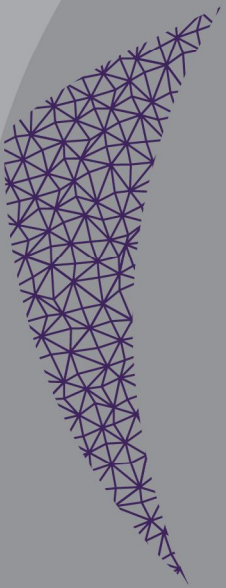


# Ensuring sustained benefits for local communities from geothermal projects

**Paul Quinlivan,  
Clean Energy Advisor,  
Sinclair Knight Merz**

Representing:  
The International Geothermal Association














The development of geothermal projects goes through several phases. What activities occur in these phases and how do they impact local communities?



# To answer this we must first understand the sequential phases in a geothermal development

	Proceed?	Proceed?	FID@30%	COD@120%
				
<b>Scientific Fieldwork</b>	<b>Exploration Drilling</b>	<b>Appraisal Drilling &amp; Feasibility</b>	<b>Construction &amp; Development Drilling</b>	<b>Operation &amp; Makeup Drilling</b>
				
Identifying that a geothermal resource is likely to exist	Confirming that a geothermal resource does exist	Proving that development of the resource is technically and economically feasible	Constructing the geothermal facility on spec, time and on budget	Operating and maintaining the geothermal facility and ensuring there is enough steam





# Physical and social impacts at different phases of a geothermal project



# What happens during these phases that affects local communities?

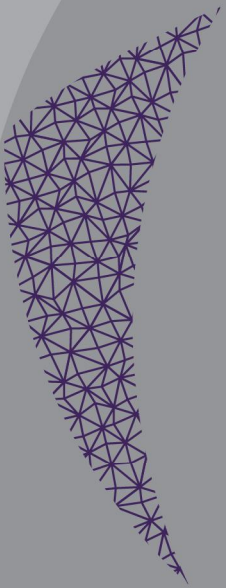
Scientific Fieldwork	Exploration Drilling	Appraisal Drilling & Feasibility	Construction & Development Drilling	Operation & Makeup Drilling
<b>Activities that Impact Local Communities</b>				
<ol style="list-style-type: none"> <li>1. Geoscientific fieldwork</li> <li>2. ESIA for exploration drilling</li> <li>3. Community/stakeholder consultations</li> <li>4. Land and drilling water agreements for exploration drilling</li> <li>5. Conceptual development study</li> </ol>	<ol style="list-style-type: none"> <li>1. Roads, wellpads, water supply</li> <li>2. Stores, offices, accommodations</li> <li>3. Well drilling and testing</li> <li>4. Pre-feasibility Study</li> </ol>	<ol style="list-style-type: none"> <li>1. More drilling, roads and wellpads</li> <li>2. ESIA for power plant</li> <li>3. Community/stakeholder consultations</li> <li>4. Land for power plant, pipelines, transmission and permanent establishment obtained</li> <li>5. Bankable Feasibility Study</li> <li>6. EPC Contract readied</li> <li>7. Funding Arranged</li> </ol>	<ol style="list-style-type: none"> <li>1. More drilling, roads and wellpads</li> <li>2. Power plant constructed</li> <li>3. Steamfield constructed</li> <li>4. Transmission line constructed</li> <li>5. Temporary construction workforce offices and accommodation built</li> <li>6. Permanent offices and accommodation built</li> </ol>	<ol style="list-style-type: none"> <li>1. Facility operated</li> <li>2. Operational staff accommodated locally</li> <li>3. Makeup well drilling</li> </ol>



# What are the main impacts on local communities?

Scientific Fieldwork	Exploration Drilling	Appraisal Drilling & Feasibility	Construction & Development Drilling	Operation & Makeup Drilling
<b>Impact on Local Communities</b>				
<p>Low but expectations are raised during the stakeholder meetings for exploration ESIA and the land negotiations for exploration drilling requirements</p>	<p>High due to:</p> <ol style="list-style-type: none"> <li>1. Influx of construction and drilling personnel</li> <li>2. Earthworks associated with the exploration drilling</li> <li>3. Rig and supply vehicle movements</li> </ol>	<p>High due to:</p> <ol style="list-style-type: none"> <li>1. Continuing influx of construction and drilling personnel</li> <li>2. Earthworks associated with the appraisal drilling</li> <li>3. Rig and supply vehicle movements</li> <li>4. Expectations are again raised during:                             <ol style="list-style-type: none"> <li>a. the stakeholder meetings for full ESIA,</li> <li>b. land negotiations for power plant, piping, transmission line and construction personnel accommodation</li> </ol> </li> </ol>	<p>High due to:</p> <ol style="list-style-type: none"> <li>1. Continuing influx of construction and drilling personnel</li> <li>2. Earthworks associated with the development drilling, power plant, piping and permanent establishment</li> <li>3. Rig and supply vehicle movements</li> <li>4. Construction of the power plant, piping, transmission line and construction personnel accommodation, and permanent establishment (offices, workshops, stores, village etc)</li> </ol>	<p>Medium but:</p> <ol style="list-style-type: none"> <li>1. Potential for ongoing fluid and gas discharges</li> <li>2. Community dissatisfaction with the number of local people employed,</li> <li>3. Ongoing makeup drilling and its associated rig and material supply requirements</li> <li>4. Potential for project to unwittingly provide access to sensitive environments for illegal activities</li> </ol>





# Traditional responses to mitigating geothermal project social impacts and providing sustainable benefits to the community





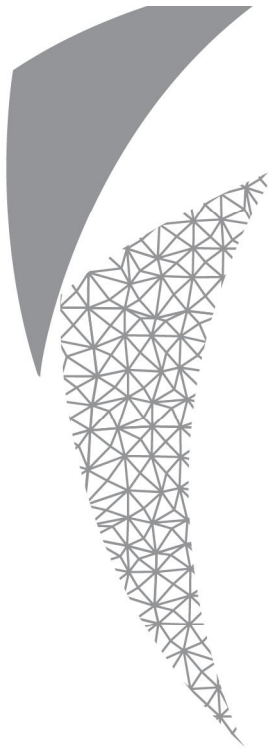
## What are the traditional responses?

- Build community facilities  
(clinics, schools, local amenities and similar)
- Maintain good relations with locals
- Provide employment for locals  
(generally labour only as the technical skills required for O&M may not be available locally)

There are problems with these responses

- They instil a “give me” mentality and do not promote capacity building in the community
- Employment opportunities are limited if locals do not have the required skills – this breeds dissatisfaction



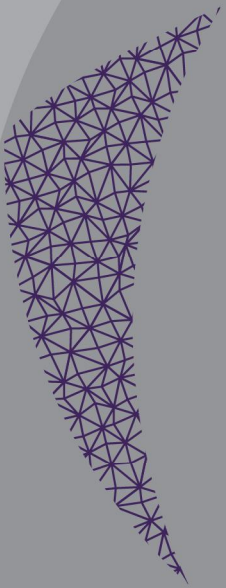


## What improved responses are possible?

Consider traditional responses but try to move away from handouts towards local capacity building by:

- Providing support for local business development with appropriate emphasis on gender balance
- Providing educational scholarships and skills training for motivated youngsters
- Being a proactive enterprise supporting the development of local institutions to combat and reduce illegal activities (particularly related to forest degradation)





What are other possible approaches that can be used to deliver sustained benefits for local communities from geothermal projects?





## Let us first consider what is missing from traditional approaches

Traditional approaches do not provide discretionary funds which local communities could use, if invested wisely, to promote long term activities which would benefit current and future generations.

In addition to the improved responses, noted in the previous slide, there could be consideration to directing **income from geothermal developments** back to the local, regional and national communities so that it can be used to support their respective community development programs.





## What can be done to bring income from geothermal projects back to the local communities for their discretionary use?

One or more of the following can help be considered:

- A. Royalties for use of the geothermal resource, based on fluid taken or electricity produced
- B. A share of government taxes based on profits achieved by the developer/owner
- C. At the time of Financial Investment Decision (FID), or at the time of re-finance after Commercial Operation Date (COD), offering local governments and/or local companies the opportunity to buy an equity share in the project ownership and thereby receive a portion of the after-tax income stream.

With the project progressively de-risked at FID and COD, Item C may be feasible and attractive.



# Plus / Delta of these approaches

Approach	Plus	Delta
Royalties	Income stream is immediate	Higher tariff is required, meaning less chance of project proceeding
Share of government taxes	Tariff can be lower, meaning more chance of project proceeding	<ol style="list-style-type: none"> <li>1. Little or no tax income may be available to share for some years after COD if the project enjoys a tax holiday in order to lower tariff</li> <li>2. Central government may not allocate a large share to the local government</li> </ol>
Return on Investment	Tariff can be lower, meaning more chance of project proceeding	Little or no tax income may be available to share for some years after COD until the project makes a taxable profit
All above	Local government can apply funds to local development needs	<b>No payment at least until project achieves COD, which can be 5-7 years in the case of a greenfield project. This can lead to real dissatisfaction.</b>



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# Another Sustainable Success Story .....

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# Limitations of all these approaches

- Geothermal projects have a lengthy development timeline, 5-7 years for a greenfield project starting at exploration, with significant risk that the projects may not proceed past some of the early end-of-phase decision gates, or they may be delayed for many years while trying to get through a decision gate.
- Communities without land ownership but who have nomadic or customary rights in the area of the project can be disenfranchised by most of the ideas presented here. Any solution that is to be truly sustainable must acknowledge their rights and their aspirations for development.



## Are there other possible solutions?

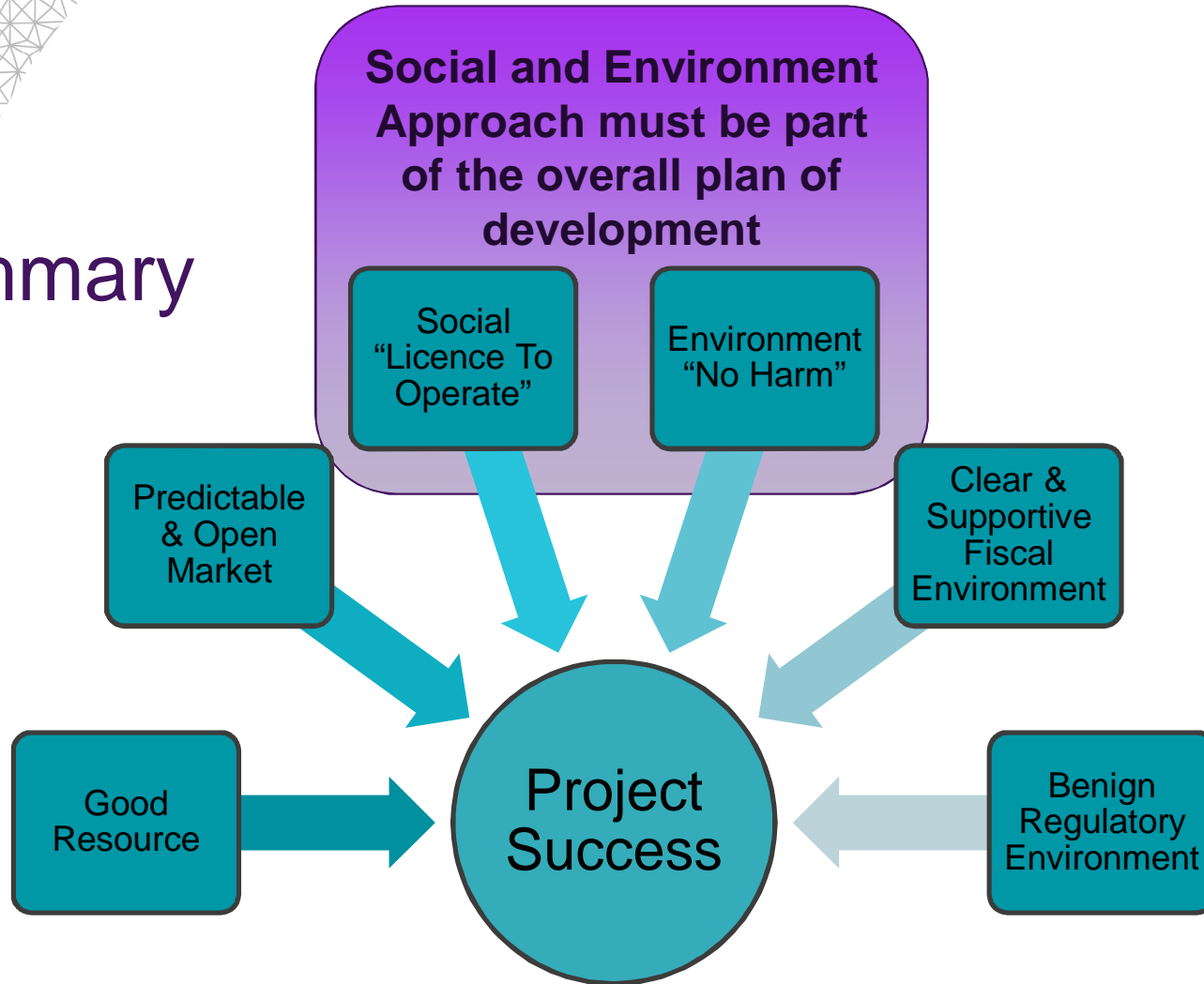
- Communities become very frustrated if they do not see real benefits within time frames that mean something real to them, especially in the early years when their acceptance of the project is required to obtain ESIA approvals for drilling and then power plant and transmission line construction.

### *A possible solution?*

- The developer could set up a fund of some significance with the local communities being responsible for administering this for the benefits of the community, but where the developer holds a right of veto if the local community wants to use the funds for activities which do not meet agreed pre-defined criteria.



# In Summary



# Contact

For more information

Paul Quinlivan

[pquinlivan@globalskm.com](mailto:pquinlivan@globalskm.com)

+64 21 608047

Visit [www.globalskm.com](http://www.globalskm.com)

