

## Support material for session 2, 3 and 4

This game is used in session 2:

The Fact Sheet is given and trainees are requested in small groups to complete a Stakeholder Analysis.

The game continues in session 3:

The game is played (takes one hour plus). It is subsequently discussed. There is not one good outcome. The importance is the process. See teacher notes for questions.

This game is referred to in session 4, when groups are asked to make a plan for setting up a participatory process.

## Making a Groundwater Management Plan for Var-Ia

### Factsheet

Var-Ia is a city of 400,000 people that is growing at a pace of over 10% per year due to population growth and influx from the rural communities. It is situated in a semi-arid region. The river Var, a small river with a peak flow of 6 m<sup>3</sup>/s after the rainy season, crosses the town.

The groundwater table in and around Var-Ia is dropping. Some experts have predicted scenarios where the fresh groundwater under the city itself will completely disappear in ten years. These doomsday scenario's were made before and have not happened, but it is a fact that whereas fifteen years ago groundwater was pumped from shallow aquifers, this is no longer possible and that water is typically lifted from 150 meter deep.

There are also signs of land subsidence. In a few parts of town land levels have lowered causing damage to infrastructure (electricity lines, roads, sewers). This land subsidence is ascribed to the depletion of groundwater.

It is safe to say that the Var-Ia basin is severely water-stressed, which is of large concern with the city growing further. Rain is only falling during the rainy season which lasts from June to September. Average rainfall is 400 mm/ year. Best estimates of effective recharge indicate that this is at best 50% of groundwater extraction in the basin around Var-Ia. The recent series of dry years has made things worse. When it rains it often floods and the floods disappear down the plateau. The floods are not retained in the Var-Ia Basin.

In the vicinity of the town there are a lot of farmers using the groundwater for crop production. In the past there were traditional well systems (still in use in a few rare places), but now it is mainly pumping with the help of tubewells. Vegetables are the main crop. These are mainly consumed in Var-Ia. Water use is relatively modest, but a lot of agro-chemicals pollute the groundwater.

In addition one major recent agro-industry is commercial flower production. These flowers are produced for export, a highly profitable enterprise. There are several applications pending for new floriculture

farms, that are attracted by the vicinity of the Var-Ia airport and the suitable micro-climate in the basin, the high profits it generates and the employment opportunities it offers.

Apart from these farmers, there is also a considerable production in Var-Ia City itself, by 'urban farmers', using the wastewater and in some cases piped drinking water for producing crops.

Among the farmers there is a distinction between a group of rich farmers, growing flowers for export markets or the urban wholesale vegetable market, that has invested in deep wells, and small farmers that can only use the shallow groundwater through traditional open well systems. This latter group is becoming smaller and smaller, as they are losing out in the 'race to the bottom'.

There is a problem with the regulation for groundwater use. In the past there were community rules on the development of wells close to drinking water sources – but these rules were not able in most localities to avoid the rapid decline, and they have now disappeared with a few exceptions.

Now there is formal regulation arranged by law. The regulation is limited to extraction permits – which is a static way of managing groundwater, particularly because according to the law all existing wells are automatically entitled to a permit. Moreover, the Regional Water Authority responsible for issuing permits is short of manpower and means of transport. The authority does have a lot of information on the groundwater: much field data (but not systematically organized) and quite some consultancy studies. Although these studies do not all go in the same direction with their conclusions, it is for sure that the groundwater-table is going down. However, the information is so complicated that nobody really understands the mechanisms that are at work. Basically apart from studies nothing has happened.

What is clear however is that every one is under threat from this negative development – irrigators, wetlands and even drinking water supply to both the city and the rural parts of the basin is under threat.

Another problem is the degradation of the quality of groundwater as a result of the lack of sanitation infrastructure in the town, and as a result of waste disposal sites in the foothills outside the city, in other words in the recharge area of the aquifer.

This all translates in:

- depleted ground water levels, putting long term water supply in danger and already making it difficult to provide water for agriculture
- deteriorating groundwater quality – a problem for the untreated rural drinking water supply but even for the city – where only 20% of the drinking water is treated
- land subsidence here and there

Alternative sources are limited. There is the Var river, but this river is heavily polluted through industrial discharge and through untreated sewerage. Even if you stop the chemical industries polluting it (zinc smelter and chemical factory) the river will stay polluted for another 20 years, due to the sludge in the riverbed. Another alternative is water harvesting. In the name of water harvesting many dams have been built but a lot of water evaporates from these dams. There are many doubts as to whether they make sense. Moreover they tend to silt up rapidly.

As for the solutions, only few suggestions that have been made, both for reducing agricultural use, for controlling urban use and for reducing the pollution. Only few suggestions have been made but even less has happened. Measures that still need to be explored are micro-irrigation, water harvesting, better soil moisture conservation by using compost, reduction of leakages in the urban water system. But whatever solutions are brought up by certain parties, it is always the others that should act. It is therefore time to put all cards on the table and come to a joint management plan.

One key event that may influence the situation is the upcoming elections in six months, where the present mayor wants to be re-elected. On the one hand he has financial backing from a couple of the agricultural firms, but he will need the support from the slum-areas, to get enough votes. He has at many times mentioned that he is the 'man of water', who will secure safe water supply to the city for many years to come.

## The Game

### Purpose of the process

The purpose of the discussions is to set up a commission that will develop a groundwater management plan for Var-Ia. This has been initiated by the Governor. The group gathering is a temporary commission, brought together by the Governor, that has to answer a number of questions, and should formulate a proposal for the permanent groundwater commission and identify some immediate actions.

In the meeting we have the following people represented:

- Var-Ia Drinking Water Company – about to be partly privatized, but suffering financially from the high cost of pumping and treatment that comes with the lack of groundwater management
- Small Farmers Association – a lobby club of farmers, consisting of senior persons, somehow a bit out of touch with modern developments
- One of the largest floriculture company – representing a large part of the employment opportunities created in the last few years
- An Environmental NGO – supported by retired university professors, full of ideas on what should be done
- A Social NGO – very actively defending the interest of urban slum dwellers
- Community drinking water group – as an example of many such community groups set up in the last decade: this one survived.
- Var-Ia Municipality – struggling with financial problems and a fast growing population
- Regional Water Authority – responsible for regulating water use in the area
- Waste Authority – just set up now working on waste disposal and in the future may be on waste water treatment or reuse

**Instructions to the group:**

**The group should discuss and take a decision regarding the following issues:**

Who should be in the permanent commission, and who not?

What should the permanent commission study and do? Budget for the commission has been promised – but it is modest, so extensive studies are out of the question.

The governor also wants some immediate visible action in the run up to the election, that is in the next six months. What does the group recommend?

## Preparations

### Need:

- Preparations: flipchart, name plates and photocopies of the roles
- every players to have a copy of his role – start the game by distributing the roles. Ask every player to read his role carefully.
- Appoint one of the players as chair. Select a balanced not too dominant but not too silent person.
  
- make a map
- town
- location aquifer
- river Var
- location wastedump / recharge / slum: north of Var-Ia
- location potential dam area
- location factories (zinc smelter and chemical factory)
  
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- If the group has more than 20 players – play two parallel games.

## Bungi Alam, Floriculture Enterprise

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

### Bungi Alam I

You are one of the largest employers in the valley with more than 1000 people employed on the farm – in growing cut flowers, in sorting and in packaging. The local climate is excellent for cut flowers and the airport of Var-Ia is convenient to ship the cargo out of the country. Bungi Alam – a consortium of Southeast Asian flower growers – settled in Var-Ia Basin under an investment promotion program. It received the land for free from the Ministry of Trade. It was made to understand that the groundwater resources in the valley were abundant, in particular in the area where the flower farm is settled which is high on the gravel fan. You do not want use surface water for your farm, because the water from the Var River contains an unpredictable cocktail of pollutants, which will jeopardize the sophisticated production system, that you have.

In the meantime you have discovered that the groundwater situation around Var-Ia City is precarious, more than you had to anticipated. You had to drill two new wells already since it started operations. In addition it is concerned that it is not able to get good quality drinking water in the housing compounds of its employees.

Bungi Alam expects the government in particular the Trade Ministry to deliver on its earlier promises and build a storage reservoir upstream of the farm to compensate for the vanishing groundwater stock. It uses arguments such as 'maintaining a good business climate' and 'respecting foreign investors'. Experts however argue that building a dam may do more harm than good, because it will store rain water and then cause it to evaporate.

You are quite interested in the Groundwater Plan, but you do not understand why an Environmental NGO needs to be involved. According to you groundwater has nothing to with environment and the NGO is not a stakeholder. You are afraid that too much attention for environmental concerns will make your business impossible.

You are a major groundwater user – for the cultivation and processing of the cut flowers. Floriculture is high on pesticide use. Unlike other countries (where you have companies) you do not treat the waste

water and reuse but instead inject the effluent in the soil. In other countries you are recycling your waste water – in this country you are not yet forced to.

What you expect from the plan is that it will deliver concrete solutions on augmenting water supply to the Basin and in particular the farm.

Licensing and paying for the water is something you do not agree with. You are already paying a lot, because you are pumping it yourself from very deep, and you made many investments so disagree to pay more.

## Small Farmers Union

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

You are in many respect a “special group” . You represent the small farmers in the valley. These small farmers were the first to settle and hence you are associated with the ethnic group that are the original inhabitants in the Valley. You still wield a lot of influence even though most small farmers are not related to your organization at all.

Several of you in fact have sold their land or converted their land into residential ‘farm houses’ with small ornamental gardens. You still consider yourself the ‘mouthpiece’ of the smaller farmers in the basin. Your viewpoint is that farming is part of the culture of the basin and the government should actively support the farming community.

The official regulation are that all wells should be licensed and that an annual fee should be paid. You are against licensing. That would be yet another bureaucratic measure. And paying for the water is out of the question.

You have heard of more efficient irrigation systems – drip systems. Also better irrigation scheduling. Measures to retain soil moisture (compost, mulching). Some of these methods are used by the floriculture companies - but farmers are not organized and there is no good extension service.

## Var-Ia Drinking Water Company (VDWC)

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

The Var-Ia Drinking Water Company is a company that was established 5 years ago. Before it was part of the public works department of the municipality. The water distribution concentrates itself in the older part of the town, and the newly developed areas where more affluent customers can be found. The older parts of the system were constructed over 70 years ago. The production is still based on groundwater extraction. It has turned more and more expensive to do this. The newly constructed production wells (4 years old), are already starting having problems due to the dropping water table and water quality (which is not systematically checked) is not good.

The costs of providing water are going through the roof because of the low level of the groundwater and the need for water treatment. It is difficult to make ends meet. Increasing the tariffs on the other hand is will also not be a very popular move.

At the same time The VDWC is in the process of looking at hiring out their management to a private consortium. But it is in your interest to present yourself as positive as possible, particularly regarding the status of your groundwater assets.

If it was up to you, you would need all the available groundwater to secure the drinking water for the next 10 years. You want a total ban on agricultural use of groundwater, as human needs take precedence. You for instance do not understand why the establishment of new floricultural farms is still encouraged. A strict new regulation on groundwater should be introduced ASAP. You are in favour of heavy penalties on any offence. At the minimum only high efficiency irrigation (as in floriculture) should be allowed.

But you can see that for the future a new source will be needed. The idea of building a dam would solve a lot of your problems. It would mean that the river will be stabilised as a source, and it will be tapped upstream from the present industrial pollution sources.

## Environmental NGO, Friends of Var-Ia Wildlife

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

Congratulations! You are selected to represent civil society in the stakeholders group around Var-Ia Basin. This is an honour – there are several other NGOs, working in environment, but they were not invited, for practical reasons: it is not possible to accommodate too many NGOs.

You are renowned for your excellent knowledge systems and you can draw on a network of (retired) university professors to provide you support. As a result you are more familiar than anyone with the groundwater situation and the major issues.

Your concerns are particular:

- the recharge zones around Var-Ia city are suffering from uncontrolled urban expansion – this slows down infiltration (many hard surfaces). Moreover the garbage belts contaminate the water
- you want to argue for a radical change in waste-management, where most of the solid waste is recycled. This has proven to be a profitable option in many places, including third world countries. Combining the composting of organic waste with the reuse of the other components can be profitable as well as advantageous for the environment. There is a lot of knowledge on this, but the government seems to have no access to this.
- The only feasible way for solving the wastewater problem, is by choosing for ecological sanitation (no flush systems). It does not make sense to use water for transporting waste in this dry country. The alternatives are there, and they can be done on the basis of small investments by every-body, instead of needing huge investments for which nobody has the funds.
- the deeper groundwater layer contains fluoride. If water supply comes to depend on this, an enormous health hazard is created: fluorosis leading to joint problems and kidney failure.
- There is a lot of scope to improve the efficiency of irrigation – by using compost (to improve water retention capacity), by growing crops that yield 'more crop per drop', by using drip/ bubbler/ sprinkler irrigation. The compost could be a product from the waste-company. Separating organic waste would be needed for that, as part of the radical change in waste-management,

mentioned earlier. That would also reduce the horrible smell of the present dump.

You object to the presence of the Small Farmers Union in the stakeholder group. They have been lobbying for free power supply and seems to be the least bothered about managing resources wisely. They are not really representative – just a vocal, self appointed group of farmers. According to you what ever they decide does not mean it represents the thinking of the larger target group of small farmers. This is a pity because in the end of the day this group of small farmers taken together represents the largest group of water users.

## Var-Ia Municipality

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

The Var-Ia municipality is facing a big problem. The city is growing faster than it can organize itself. Public services are way behind, so people take it into their own hands. That makes it even more difficult to come later on with new solutions, because people have already invested in their own.

The extension of the city is taking place quite unplanned. There is a slum developing around the waste-dump north of the city. You are letting it happen

The city is basically broke. The payment of city taxes is dropping, so in spite of the growth in population, the budget has stagnated for the last 6 years.

You would prefer to kick out some of the farmers within the urban borders, to stop their consumption of groundwater. That wont be possible, so you would have to buy them out, but you have no money.

The city has not much legal means, nor has it the capacity, to take measures. It is depending on others.

You are in favour of a new groundwater regulation, if that solves the problem, but you do not know why.

You are aware of the wastewater problem. But this is something that is impossible to cover, if major investments are not done.

You want money from the state for all these plans.

## Var-Ia Peoples Association (VPA)

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

The Var-Ia Peoples Association (VPA) is an NGO that has been working in the poor areas of Var-Ia for the last 28 years. They are highly appreciated by the poor people, as the NGO has always been able to reveal the negative effects of the plans of the municipal government, and was often able to change those plans.

The crisis is very real for the people in the slum areas, where 60 percent of the inhabitants are living (20% according to the municipality, but that is because they refuse to acknowledge the presence of many newcomers. This is related to the political reality and the upcoming elections, that would be lost by the ruling party if the slums would have their full voice.

Due to the dropping groundwater table, almost all the slums have been suffering from a major water-crisis. People have been digging until they hit solid rock. Water is now tankered in, and then sold per bucket. There is no piped supply, even if a main is passing 2 of the 3 major slums. People have threatened to blow up the pipe.

The VPA demands to be part of the commission. The VPA demands immediate access to piped drinking water, through the direct installation of public taps, and gradual installation of household connections. This will require all the groundwater that is available, leaving no water for the agricultural use.

The VPA demands that government takes action to set up a sanitation system for the slums, thus reducing the enormous prevalence of diarrhea.

It is obvious that the VPA has no funds for supporting the study.

## Regional Water Authority

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

As the Regional Water Authority you need a plan, and fast. There is a definite crisis in the making if you are not allowed to take drastic measures. For this you need support from many actors.

You are in fact the representative of the national government at regional level. Your political boss is the minister of infrastructure and water. He is a technocrat, and not really interested in all these participatory processes, but you convinced him that this is the only way to get things done quickly, provided everybody is willing to participate and contribute.

Your minister would like to see a continued expansion of Var-Ia, allowing him to construct an additional ring-road for which he thinks he can find financing.

Inefficient agriculture does not really fit in this plan. They use the water that is needed by the present and future citizens of Var-Ia. On the other hand you also know of many solutions that are not yet tried in the area. Some of your staff in particular went to other countries and witnessed some very effective water harvesting programmes.

## Var-Ia Waste Authority

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

The VWA has been created last year. You have a very small organisation, that is mainly busy trucking waste out of the town. The main problem for you right now is having a cheap dumping site. The current dumpsite (in the recharge zone of the foothills close to the new slum development) is almost filled.

Formally you are also in charge of wastewater, but there is no way we can deal with this. The state government has to come with money for this.

You want to be in the commission. But the NGO's and community groups have to be out. This is a government responsibility. That is all you know.

## Rural Drinking Water Community Group

Welcome to the stakeholder group on the Var-Ia Basin Groundwater Plan!

In the past under an international loan program most rural drinking water facilities in the area were improved. To look after them Community Groups were established. These groups appointed an operator, collected funds for maintenance and arranged the repairs. Your committee is one of them – many of the committees still survive, though some are not able to do all repairs required. By and large the performance is good. Several community groups were forced to deepen the common well, because of the falling water levels. By and large however most village drinking water systems are still 'in business'. You have some concern however on the quality of drinking water. Some sources suggest that the water in the wells may contain substances that cause diseases. What exactly you do not know.

On the agricultural side you have seen a lot of problems however. In your village most young people have moved out because it is difficult to see a future as many more shallow agricultural wells have become unreliable. What in the past took 2 hours to irrigate now takes half a day, because the discharge in the wells is so much less. So young people now look for jobs in the floriculture companies or in the city.

What you want is that more serious attention is paid to water harvesting – there were some government programs in the past doing that, but they were not implemented properly. Maybe people should do more themselves in water harvesting.

## **Training considerations**

By asking the participants to compose a team, they have to think about stakeholders and their role. You can use that as a startingpoint for a more specific exercise later in the training.

Handing a combined role of chairperson PLUS one of the interest roles to a person, you are in fact doing something that happens all the time, and you can discuss that aspect during the evaluation.

Handing roles to persons can help them to be in a situation from a different perspective. The guy who has worked in government all his life can learn a lot from being in the NGO position. This is also a point for the evaluation, and for the rest of the training: try to imagine what it is like to be in the other positions. It helps you to build bridges and you can try to evaluate your own behaviour, how the others may perceive you.

We include 1 or 2 'impossible figures', which are in fact a reality in many situations: the actual use is much bigger than the sustainable use of the aquifer, resulting in 'mining' of the resource. That means there is not a 'right answer' for solving the problems. It will leave the group with decisions like 'we are going to look for alternative sources', and that is fine.

Preparatory exercise: prisoners dilemma; this exercise is done to show participants how easy it is to lose trust, how easy you are tempted to betrayal, what the effect of 'repeated games' or longer relations are.

Handing out of the general material. This can even be sent before the training.

Plenary introduction by the trainer. You introduce some general aspects of negotiating, cooperation, multistakeholder processes.

Handing out of the roles (stress that this is confidential information). Also provide badges with the role and space for the participant to put her/his name. In case of more than one group, use different colours to distinguish between the groups.

First meeting of the group. Here a short plenary meeting takes place, where the designated chairperson will try to get the rest of the group agreeing on process.

After the formal part of the meeting, the group starts informal discussions. As a trainer you observe what happens, and make notes. If you have additional trainers, put one person on every group to observe (do not interact with them, unless there is unclarity about the rules of the game, and than give only minimal intructions. **STAY OUT OF THE CONTENT OF THE GAME**

Second meeting, preferably next day; this is the formal negotiating meeting, where the group has to reach an agreement on the key issues under time pressure. It is the responsibility of the chairpersons to gather their group, and get them going. Check in on the chairpersons during breakfast, ask how they're doing.

Presentation / plenary evaluation; Take the presentations in pairs (if you have the game played parallel – if not go directly to the discussion), allowing you to make comparing analyses throughout the presenting process.

Questions to ask are:

- What was the role of the chair? Was he impartial or did he mix functions?
- What will happen with groups not selected in permanent committee? Will they begrudge it? How to deal with.
- How is the committee composed? No one left out (for instance zinc smelter)?
- On the agenda for the committee – it is important not to decide and solve all, but to agree on what to do.
- On immediate proposals: discuss how priorities were set? Was there a thought on who would do it? Realistic?
- Was everyone active? How is result influenced by weakness of players?
- How to deal with uncertainties (for instance on budget and mandate of permanent committee)? Make sure they are noted and asked to governor for instance.