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A structured scientific solution to the Israeli–Palestinian conflict: the analytic hierarchy process approach

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Abstract

While the Israeli–Palestinian conflict has raged for decades, in all of its ramifications there has never been a totally structured or scientific approach to the conflict with all of its details. The Analytic Hierarchy Process (AHP) approaches the problem along these lines. There are a plethora of reasons why the traditional face to face negotiations have broken down over the years. This paper identifies a significant number of those impediments and indicates how the AHP can productively address them. A summary of the highlights of the AHP approach precedes how it has been applied to the Israeli–Palestinian conflict. To date, the participants, significant members of both communities, have derived and agreed upon a solution that includes all the major issues, except for the refugee problem. That problem is currently being worked on, but will take an extended period because of the unique factors involved. What has been provided is an agreed upon solution to virtually all of the issues impeding past negotiations, including borders, settlements, the status of Jerusalem, the Holy Places, security and expectations of each side.

Background

Five years ago we began preliminary work to organize the difficult issues, associated with the six decade old confrontation between Israel and the Palestinians. With the support of a number of private foundations, we were able, on several occasions, to gather together in Pittsburgh participant groups of equal size, consisting of people who were interested in and knowledgeable about this conflict. Over time these initial participants were replaced by citizens of Israel and of Palestinian residency. Finally, a group of prominent Israeli and Palestinian leaders were invited to complete the cycle. This latter group has worked together for several years and has developed trust and confidence in one another that facilitated their deliberations. These serious-minded and influential participants proceeded to pursue goals to provide decision makers with quantitatively based parameters with regard to the major issues involved in the conflict. The last two meetings were held in January and in April of 2014. A summary of how AHP can be used to resolve conflicts is shown in section two of this paper. Suffice it to say that the advantages which the AHP provides over face to face negotiations are critical intellectually and substantively.

These advantages include minimizing the emotional interplay between the parties, accurately measuring the impact of intangible factors not previously considered,

providing an opportunity to consider every possible issue involved, identifying all concessions that could be made by either party, no matter which party articulated them, providing an opportunity for tradeoffs between and among concessions, establishing values for each concession that create priorities expressing the importance, as accurately measured, of each factor involved, and using a hierarchical structure to establish the benefits, opportunities, costs and risks.

We began with testing how this *retributive conflict* (one in which both sides profess to desire a solution but were equally committed to inflicting pain on the other party) could be profitably addressed by the AHP, a mathematical theory concerned, among other factors, with the measurement of the crucial intangible criteria at the heart of this conflict. This paper can serve to illustrate how mathematics can help quantify the value of tradeoffs necessary to solve this impasse. Over the years, the AHP has been successfully applied in a wide variety of complex corporate and military decisions, involving resource allocation and prioritization of options, such as Poland's decision not to join the Euro zone, and in some extremely sensitive political situations, such as the conflicts in Northern Ireland and South Africa.

We are not the only ones who believe that the Israeli Palestinian interaction is one of the most serious problems facing the world community. According to the philanthropist Jeffrey Skoll in a television interview, the five problems he's convinced pose immediate danger to humanity are "climate change, water security, pandemics, nuclear proliferation and the *Middle East conflict*." (Skoll 2013).

The analytic hierarchy process

A particular challenge for dealing with controversies as intractable as the Israeli–Palestinian conflict is how to measure the intangible factors, which may even have more influence over the outcome than the tangible factors. AHP addresses this issue through the use of pairwise comparisons, because the importance of such factors changes from one problem to another. What is needed are relative priorities developed for each problem within the context of its own diversity of factors and their influences on the actors involved and the concessions that they exchange.

The Analytic Hierarchy modeling and measurement process (AHP) is a scientific approach used to determine the relative importance of a set of activities or criteria. The novel aspect and major distinction of this approach is that it structures any complex, multi-person, multi-criteria, and multi-period problem hierarchically. Using a method for scaling the weights of the elements in each level of the hierarchy with respect to an element (e.g., a criterion or property they share) of the next higher level, a matrix of pairwise comparisons of the activities can be constructed, where the entries indicate the strength with which one element dominates another with respect to a given criterion. This scaling formulation is translated into a largest eigenvalue problem, which results in a normalized and unique vector of priority weights for each level of the hierarchy (always with respect to the criteria in the next level), which in turn results in a single composite vector of weights for the entire hierarchy. This vector measures the relative priority of all entities at the lowest level that enables the accomplishment of the highest objective of the hierarchy. These relative priority weights can provide guidelines for the allocation of resources among the entities at the lower levels of the hierarchy. When hierarchies are designed to reflect likely environmental scenarios, corporate objectives, current and proposed product/market alternatives, and

various marketing strategy options, the AHP can provide a framework and methodology for the determination of a number of key corporate and marketing decisions of the firm.

The AHP focuses on dominance matrices and their corresponding measurement- the ignored areas of research compared with the more popular proximity, profile, and joint measurement approaches. It goes beyond the probability kind of comparative judgment approach (which of two things is more likely to happen) by relaxing the assumption of normality on the parameters; e.g., equal variance and zero covariance and restriction of the type of comparisons. The Analytic Hierarchy develops the tradeoff in the course of structuring and analyzing a series of simple reciprocal pairwise comparison matrices. The AHP is based on three major components:

1. AHP begins by decomposing a complex problem into a hierarchy; each level consists of a few manageable elements and each element is, in turn, decomposed into another set of elements. The process continues down to the most specific elements of the problem, typically the specific courses of action considered, which are represented at the lowest level of the hierarchy. Structuring any decision problem hierarchically is an exercise in creative thinking and is an efficient way for dealing with complexity and identifying the major components of the problem. There is no single general hierarchical structure, and one of the major attributes of the AHP is the flexibility it allows to construct a hierarchy to fit the idiosyncratic needs of the decision makers.
2. A measurement methodology is used to establish priorities among the elements within each stratum of the hierarchy. This is accomplished by asking the participants to evaluate each set of elements in a pairwise fashion with respect to each of the elements in a higher stratum. This measurement methodology provides the framework for deriving numerical priorities for ranking the alternatives of action.
3. Work for data collection and analysis constitutes the heart of the AHP. Structurally, the hierarchy is broken down into a series of paired comparison matrices, and the participants are asked to evaluate the off-diagonal relationship in one half of each matrix. Reciprocals are placed in the transposed positions, because if A is judged to be five times bigger than B, then B needs to be 1/5 as big as A.

Examples of how the AHP can be applied to a wide variety of problems are shown below.

Comparing five areas

Figure 1 shows five geometric areas to which we can apply the paired comparison process to test the validity of the procedure. The object is to compare them in pairs for area by eyeballing them to reproduce the overall relative weights or priorities. The absolute numbers for each pairwise comparison are shown in Table 1. Inverses are automatically entered in the transpose position. We can approximate the priorities from this matrix by normalizing each column and then taking the average of the corresponding entries in the columns. Table 1 gives the actual measurements in relative form on the right. An element on the left is compared with another at the top as to its dominance. If it is not larger than one, the top element is compared with it and the reciprocal value is used.

In making paired comparisons one assigns numbers to judgments about dominance. An element compared with itself with respect to a certain criterion is always equal to 1. Therefore, the main diagonal entries of the pairwise comparison matrix are all 1. The numbers

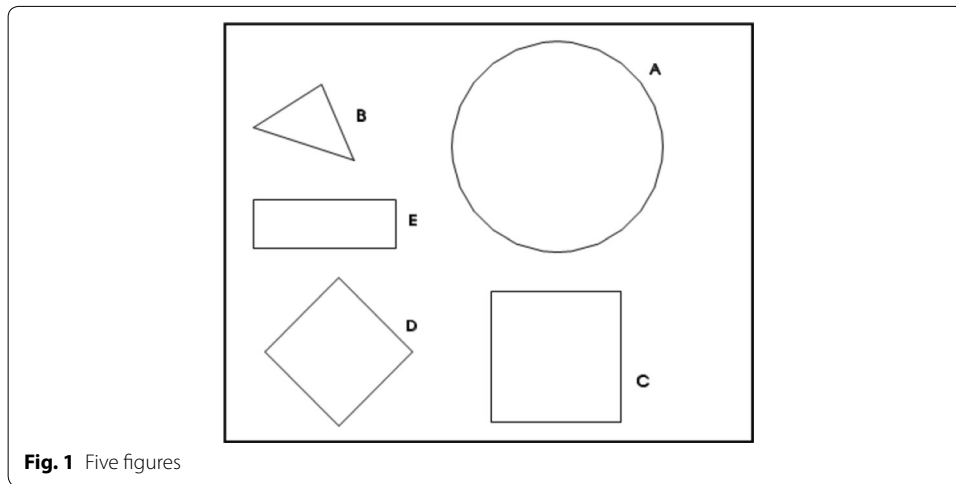


Table 1 Judgments, outcomes, and actual relative sizes of the five geometric shapes

Figure	Circle	Triangle	Square	Diamond	Rectangle	Priorities (Eigen-vector)	Actual relative size
Circle	1	9	2	3	5	0.462	0.471
Triangle	1/9	1	1/5	1/3	1/2	0.049	0.050
Square	1/2	5	1	3/2	3	0.245	0.234
Diamond	1/3	3	2/3	1	3/2	0.151	0.149
Rectangle	1/5	2	1/3	2/3	1	0.093	0.096

The next-to-last column in Table 1 gives the priorities derived from judgment

3, 5, 7, and 9 correspond to the verbal judgments “moderately more dominant”, “strongly more dominant”, “very strongly more dominant”, and “extremely more dominant”, with 2, 4, 6, and 8 between the previous values. Reciprocal values are automatically entered in the transpose position. We are permitted to interpolate values between the integers, if desired or use numbers from an actual ratio scale of measurement. The AHP uses the integers 1 to 9 as its Fundamental Scale of Absolute Numbers corresponding to the aforementioned verbal statements for the comparisons. This scale can be extended indefinitely by breaking things into clusters and using the largest element in one cluster as the smallest element in the next adjacent cluster, dividing all the priorities in the second cluster by this element’s value and then multiplying all values in the second cluster by the priority of that element in the first cluster so that common element has the same value in the two clusters and so on. Thus one continues to use the same 1–9 values to compare elements in new clusters.

Estimating US consumption of different drinks

A more abstract form of comparisons would involve elements with tangible properties that one must think about but cannot be perceived through the senses. See the judgments in Table 2 for estimating the Relative Consumption of Drinks. An audience of about 30 people, using consensus to arrive at each judgment, provided judgments to estimate the dominance of the consumption of drinks in the United States (which drink is consumed more in the US and how much more than another drink?). The derived vector of relative consumption and the actual vector, obtained by normalizing the consumption given in official statistical data sources, are at the bottom of the table.

Table 2 Relative consumption of drinks
Which Drink is Consumed More in the U.S.?
 An Example of Estimation Using Judgments

Drink Consumption in the U.S.	Coffee	Wine	Tea	Beer	Sodas	Milk	Water
Coffee	1	9	5	2	1	1	1/2
Wine	1/9	1	1/3	1/9	1/9	1/9	1/9
Tea	1/5	2	1	1/3	1/4	1/3	1/9
Beer	1/2	9	3	1	1/2	1	1/3
Sodas	1	9	4	2	1	2	1/2
Milk	1	9	3	1	1/2	1	1/3
Water	2	9	9	3	2	3	1

The derived scale based on the judgments in the matrix is:
 Coffee Wine Tea Beer Sodas Milk Water
 .177 .019 .042 .116 .190 .129 .327

The actual consumption (from statistical sources) is:
 .180 .010 .040 .120 .180 .140 .330

Note that while in the first example, Table 1, the eye perceives different size areas, in the second example, Table 2, the mind, through wide experience and education, has a feeling for how much more frequently one drink is consumed than the other is consumed, in a pairwise comparison. Feelings are usually distinguished qualitatively and associated with numerical values. It is fortunate, in this example, that people tend to consume nearly the same amount of liquid, about a glassful, of whatever kind of drink is being consumed. Estimating the quantity of consumption is different than estimating frequency of consumption.

Buying the Best Car

How do we choose the best car from among three alternatives by considering different importance priorities for the four criteria, some intangible and some tangible: prestige, price, miles per gallon and comfort? We use the hierarchy in Fig. 2 to represent this decision.

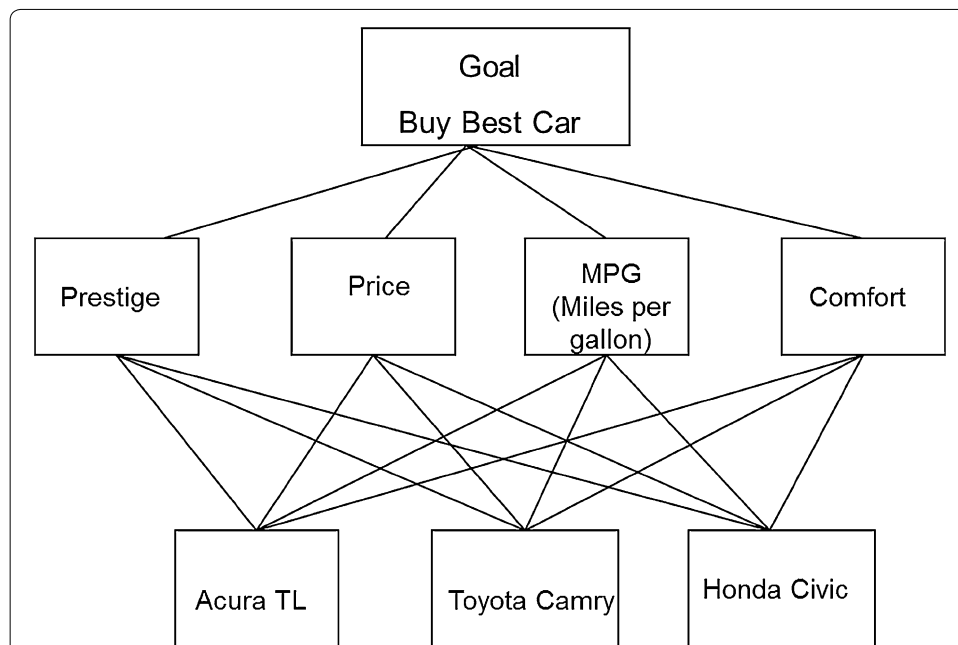


Fig. 2 Three-level Hierarchy to Choose the Best Car

The pairwise comparisons of the criteria are given in Table 3. Criteria must always be compared to derive their priorities. We then compare the alternatives with respect to the criteria in Table 4a–d. Table 5 gives the synthesis of the priorities of the alternatives shown in the next-to-last columns of Table 4a–d, multiplied by the priorities of the criteria given in the last column of Table 3. The process of weighting, adding and normalizing priorities to one is called the distributive mode of synthesis. By contrast if one divides by the largest priority among the synthesized values, the result is called the ideal mode of synthesis. For more about synthesis modes see (Saaty 2005).

Psychologists have noted that there are two ways to make comparisons of alternatives. One is to compare them by considering each pair, as we have done above, and the other is to compare each alternative with an ideal one has in mind. Because, in the case of cars,

Table 3 Pairwise comparisons of the criteria as to their importance in choosing a best car

Goal	Prestige	Price	MPG	Comfort	Priorities
Prestige	1	1/4	1/3	1/2	0.099
Price	4	1	3	3/2	0.425
MPG	3	1/3	1	1/3	0.169
Comfort	2	2/3	3	1	0.308

Table 4 Comparisons of the alternatives with respect to the criteria

Prestige	Acura TL	Toyota Camry	Honda Civic	Priority Distributive	Priority Ideal
(a) Comparison of cars with respect to prestige					
Acura TL	1	8	4	0.707	1
Toyota Camry	1/8	1	1/4	0.07	0.099
Honda Civic	1/4	4	1	0.223	0.315
(b) Comparison of cars with respect to price					
Acura TL	1	1/4	1/9	0.063	0.085
Toyota Camry	4	1	1/5	0.194	0.261
Honda Civic	9	5	1	0.743	1
(c) Comparison of cars with respect to MPG					
Acura TL	1	2/3	1/3	0.182	0.333
Toyota Camry	1 1/2	1	1/2	0.273	0.5
Honda Civic	3	2	1	0.545	1
(d) Comparison of cars with respect to comfort					
Acura TL	1	4	7	0.705	1
Toyota Camry	1/4	1	3	0.211	0.299
Honda Civic	1/7	1/3	1	0.084	0.119

Table 5 Synthesis of the priorities of the alternatives

Priorities	Prestige 0.099	Price 0.425	MPG 0.169	Comfort 0.308	Synthesis of Overall Priorities
Acura TL	0.707	0.063	0.182	0.705	0.342
Toyota Camry	0.070	0.194	0.273	0.211	0.204
Honda Civic	0.223	0.743	0.545	0.084	0.454

The Honda Civic is the best car to buy because its overall priority is the largest

we only know about the three cars we are considering, we make the best of them under each criterion the ideal for that criterion. To do that we divide the priorities under each criterion by the largest among them and that one becomes the ideal. This is shown in the last column of Table 4a–d. Using those values we have Table 6 to obtain the synthesis of the alternatives.

Note that the overall priorities are different but the ranks and the normalized priorities are the same in Tables 5 and 6, but they need not be. Frequently people prefer to use the answer in Table 6, because that way if more cars are added each is compared only with the ideal for that criterion and the rank of the three initial alternatives stays the same.

Actually, one would not interpret tangibles to make a decision for another person and often would use the actual measurements for those tangibles as indicators for their relative worth or importance. Thus, if instead of using judgments for the price, we use the ratio of the actual prices as shown in Table 7 (in fact, we use the inverses of these ratios because lower prices should have higher priorities) and then compute the priorities, we would obtain the same answer as simply normalizing the prices. In using direct data one must be careful to invert the priorities obtained if higher numbers mean less desirable.

With the ratio of the actual prices being used for the vector of priorities, Table 8 gives the overall priorities of the alternatives in the ideal mode.

In this case the Acura is slightly better than the Honda, but not by very much. As to be expected, the priorities in Table 8 are different from those in Table 6, obtained from judgments.

Table 6 Synthesis of the priorities of the alternatives using ideals to obtain the overall priorities

Priorities	Prestige 0.099	Price 0.425	MPG 0.169	Comfort 0.308	Overall priorities	Normalized
Acura TL	1.000	0.085	0.333	1.000	0.499	0.342
Toyota Camry	0.099	0.261	0.500	0.299	0.297	0.204
Honda Civic	0.315	1.000	1.000	0.119	0.661	0.454

Again, the Honda Civic is the best

Table 7 Priorities of cars with respect to price using actual dollar values

Price in Dollars	Average Prices	Average Prices Used as Priorities	Invert Priorities	Final Priorities (normalized)	Ideal Priorities
Acura TL	32,500	0.425	1/0.425	0.247	0.554
Toyota Camry	26,000	0.340	1/0.340	0.308	0.692
Honda Civic	18,000	0.235	1/0.235	0.445	1.000
Sum	76,500	1	0.00012479	1	

Table 8 Ideal synthesis to obtain the priorities of the cars

Priorities	Prestige 0.099	Price 0.425	MPG 0.169	Comfort 0.308	Overall Priorities	Normalized to One
Acura TL	1.000	0.554	0.333	1.000	0.698	0.379
Toyota Camry	0.099	0.692	0.500	0.299	0.480	0.261
Honda Civic	0.315	1.000	1.000	0.119	0.661	0.359

We note that in making comparisons, the value of any element depends on the value of what it is compared with. It is not like assigning it a number from a scale of measurement with an arbitrary unit. This led to a criticism about rank reversal when new alternatives are added or old ones deleted by those who, in single but not multiple criteria rankings, were only used to assigning elements one at a time numbers from a scale. In multicriteria decisions, for example, criteria need to always be compared because one cannot meaningfully assign importance to them, even if some people try doing it, and scales are then developed for each criterion separately. The answer to rank preservation or reversal does not lie in a mathematical theorem that says that rank must always be preserved. There are numerous examples that show that rank reversals can and should occur in practice (Saaty 2005).

To preserve rank, the ratings mode was developed by constructing through pairwise comparisons a rating scale for each criterion. These rating scales opened the door for using numerical data in normalized (by dividing each value by the sum of all the values) form, and also using mathematical functions as desired. Alternatives are then rated independently, one at a time, by selecting the appropriate rating for it on each criterion. By pre-evaluating ranges of data through expert judgment, it makes it possible to automate the process of evaluating data. Thus, one uses comparisons or ratings, depending on the circumstances. When the criteria are changeable, as in selecting the best CEO for a company, one uses comparisons and its corresponding method of synthesis, called the distributive mode. When the criteria are standardized, as in the admission of students to a university, evaluating projects or military officers, one uses ratings with its ideal mode, even when the ideal may change because of adding new alternatives never previously encountered or conceived. Note: This is the method we use below to derive the priorities of the concessions with respect to benefits, costs, perceived benefits and costs in all the tables that follow.

Retributive conflicts and the AHP

There are two types of conflict resolution. We call the first kind constructive. It is what is conventionally treated in the so-called rational approach to conflict resolution. Each party identifies its demands, and it is assumed that a way can be found to satisfy both parties' demands fairly. Fairly here means that each party forms a ratio of its benefits to those of the opponent and attempts to satisfy its own needs, at least as much as its perceived evaluation of the opponent's benefits, because the utilities or values may be interpreted differently by the two sides. The tug of war by each side can end up in equalizing the ratio to unity. That is why it is inadvisable for either party to give up too early.

In this case, negotiations begin with each party setting down what it expects to get. The negotiations may either result in getting that much, or changing the outcome so that both sides receive more, or often, less than their expectations because there is not enough to go around. The parties begin by offering some concessions from a larger set of concessions, which they maintain secretly. An offer is evaluated in terms of the benefits of the counter-offer received and may be withdrawn, if not reciprocated adequately.

The second kind of conflict is retributive with one or both parties harboring ill will towards each other. The idea is particularly relevant in long drawn-out conflicts, which in the end fester and create almost ineradicable resentments. Here a party may be willing to give up much of its demands, if misfortune can be brought to its opponent through some means, including justice as dispensed by the court system. Should the enemy die,

they may forgive and forget, or sometimes they may be resentful because they have not extracted their pound of flesh.

Thus, in negotiations, each party not only calculates the incremental benefits it gets, but also the costs to its opponent. The more of either, the greater is the gain. Gain is the product of the benefits to the party and the costs (whose aim may also be long-run benefits) to the opponent. Each side must calculate what it estimates to be the opponent's gain as a product of benefits to the opponent and costs to itself and make sure that the ratio of its gain to the opponent's gain, which it considers as a loss, is greater than unity or not less than what the opponent is perceived to get. Thus, each party is concerned with maximizing its gains via its benefits and the costs to the opponent, and also by negotiating to increase this gain and decrease its loss (which is a gain to the opponent). When several concessions are considered simultaneously, sums of the products of benefits and costs must be taken. We have the following ratios for the two parties A and B:

$$\begin{aligned} & \text{(as perceived by A)} \\ \text{A's ratio} & \frac{\text{gain to A}}{\text{A's perception of gain to B}} = \frac{\sum \text{A's benefits} \times \text{B's costs}}{\sum \text{B's benefits} \times \text{A's costs}} = \frac{\text{gain to A}}{\text{loss to A}} \end{aligned}$$

where \sum is the sum taken over all concessions by B in the numerator and by A in the denominator. A's *perceived ratio* for B is the reciprocal of the above.

$$\begin{aligned} & \text{(as perceived by B)} \\ \text{B's ratio} & \frac{\text{gain to B}}{\text{B's perception of gain to A}} = \frac{\sum \text{B's benefits} \times \text{A's costs}}{\sum \text{A's benefits} \times \text{B's costs}} = \frac{\text{gain to B}}{\text{loss to B}} \end{aligned}$$

where Σ is the sum taken over all concessions by A in the numerator and by B in the denominator. A's *perceived ratio* for A is the reciprocal of the above. If both A and B's perceive benefits and costs in the same way, these ratios would be reciprocals of each other. This almost never happens, however.

Obviously, each party would like its ratio to be as high as possible. If A's ratio for some package is less than 1, then A will perceive B's ratio as being greater than 1 and will feel that it has not been treated fairly. The aim must be to find single concessions and groups of concessions where each party perceives its own ratio to be greater than 1. This requires skilled mediation.

As just explained, each party calculates its gain as the product of its benefits and its perceived value of the costs to the opponent and its loss as the product of its costs and its perceived value of the benefits to the opponent. Thus, in a conflict resolution scenario, wherein each party has a set of concessions to make, party A, for example, calculates the benefits it will accrue from B's concessions to A, and its perception of the costs to B for these concessions.

Thus, there will ordinarily be four such calculations for each party and many more for a mediator, for example, who would use the judgments the parties give him and would compare them with his own perceptions; the mediator would then attempt to alter their perceptions or convince them that certain concessions are more to their advantage and advise them of the order in which such concessions should be made.

If each of the ratios is perceived by the corresponding party to be less than unity, the problem is to alter these perceptions, so that both parties think that they are equally treated. By looking at their own ratio and the opponent's ratio as perceived by them, which is the reciprocal of their ratio, the parties will tend to argue as follows: "Look what I am giving up. He gets high benefits and the costs to me are very high. He should be happy. On the other hand, look at what he is offering me. My benefits are low and the costs to him are very low. It is not a fair trade. He is not hurting enough in what he is offering me."

Note that constructive conflict resolution is a special case of retributive conflict resolution whereby the costs to the opponent are assigned a unit value. Each party assumes that the opponent is paying the full cost and concentrates on maximizing its own benefits. He cannot assign any additional costs to the opponent.

The chief purpose of AHP is to provide decision makers with objective, numerical parameters regarding specific core issues. From such a valuation model, decision makers have access to a rationally based model/tool for addressing and resolving specific, complex issues.

The primary benefit of the AHP as a tool for Middle East peace negotiators, whether used internally or together between the parties, is to reduce uncertainties—between and among the parties—on the relative value of core issues as negotiators address the "trade-off/exchange" component of negotiations. The information produced by this tool enhances rationally-based decision-making, helps reduce emotion in negotiations, and assesses more accurately the relative value that each group attaches to a particular issue.

The trade-off model is predicated upon development and application of a process that reflects both in-depth understanding of values attached by the respective parties (or sub-parties) to an issue, and the importance of that issue in relation to other issues, of lesser, similar, or greater value. Of equal importance is determining the value the other side attaches to that issue and the value both sides attach within the context of a trade-off or trade-offs.

The process requires assigning numerical values that measure the respective importance of each issue for the parties involved; it is that assessment/assignment that enables rationally based decision-making in the context of potential trade-offs. AHP focuses on articulation and application of self-interest in a paradigm emphasizing trade-offs, whereby both sides seek to "expand the pie"—and avoid zero-sum calculations that emphasize maximization of benefits for one side, to the detriment of the other side.

The list of eight basic ideas behind the trade-offs is as follows:

1. Each party identifies a set of concessions (trade-offs). For example Tables 9 and 10 reflect these basic ideas in the case of the Israeli–Palestinian controversy.
2. Each trade-off that a party gives away yields for that party a set of costs (not necessarily monetary) and a perceived set of benefits for the party receiving it (Table 11).
3. Each trade-off that a party receives generates a set of benefits and a perceived set of losses for the party giving it away (Table 12).
4. The benefits, costs, perceived benefits and perceived costs are prioritized, using the AHP. (see the Priorities column in Tables 11 and 12).
5. The trade-offs are evaluated according to the benefits, costs, perceived benefits, and perceived costs (Table 13).

Table 9 Possible Israeli concessions

Israelis' concessions	Description
1	Abandon the Idea of a Jewish State
2	Accept Palestinian full control of the borders of the Palestinian State and its outlets
3	Accept the historical responsibility for the Palestinian refugee problem
4	Accept the Palestinian refugee rights to return
5	Accept to abide by the status quo in the holy places in Jerusalem
6	Accept to abolish the law of return
7	Accept to respect the integrity of the West Bank and Gaza by allowing free and safe passage between the two areas
8	Accept East Jerusalem as the capital of the Palestinian State
9	Accept Two-State solution on the borders of the 4th of June 1967
10	Allow all parties to have equal access to and control of religious sites and holy places
11	Allow the sharing of all natural resources between Palestinians and Israelis
12	Comply with all applicable UN Resolutions
13	Evacuate settlers of Jewish settlements on land claimed by the Palestinians with or without compensation
14	Release all political prisoners including those who are Israeli citizens
15	Share Jerusalem as two capitals of two states
16	Solve the Palestinian refugee problem in a just and agreed upon manner
17	Stop incitement by the religious and national education and religious leaders in Israel against Muslims and Arabs

Table 10 Possible Palestinian concessions

Palestinians' concessions	Description
1	Accept mutually agreed upon land swap
2	Accept settlers under Palestinian sovereignty as residents
3	Accept the temporary presence of a multinational military monitoring system in Jordan Valley
4	Accept a Two-State solution
5	Accept a Two-State solution which includes a non-contiguous state
6	Acknowledge Israel's existence as a Jewish State
7	Acknowledge Israel's existence as an independent state
8	Agree to compromise to the demand of the right of return
9	Agreeing with Palestinian demilitarized state
10	Preserve the status quo in the Holy places of Jerusalem
11	Allow Israel to use Palestinian airspace
12	Declare against Iranian nuclear development
13	Denounce and reign in violence
14	Denounce Iranian pursuit of nuclear arms and support Israelis effort to remove the threat
15	Lobby Arab states to allow both Israelis and Palestinians to have the right to return to their land of origin
16	Make compromises on the status of Jerusalem
17	Palestinians must guarantee that any agreement reached with Israel will be accepted and supported by the majority of the Palestinian people, both in Gaza and the West Bank
18	Refrain and work against any anti-Israel sentiments in Palestinian schools
19	Seek assistance for a legitimate settlement of refugees
20	Sharing of natural resources
21	Work cooperatively and in active engagement w/Israel

Table 11 Israeli and Palestinian costs and perceived benefits

	Priorities
Israeli costs from its concessions	
Integrity and unity of Israeli society post-agreement	0.0659
Security	0.1831
Strengthening the alliance with the United States	0.0457
Make Israel more attractive to Jewish diaspora and Israelis citizens	0.0322
End of claims and end of conflict	0.2093
Legitimization of the State of Israel	0.0778
Stop being occupiers	0.0477
Peace, economy and stability in region	0.086
Maintain the Jewish majority of Israel alongside with the Arab minority	0.2249
Weakening the radical forces in the Middle East headed by Iran	0.0274
Israeli perception of Palestinian benefits from Israeli concessions	
Freedom, dignity and feeling of equality	0.1449
Independent state	0.2145
Evacuation of the settlers in the settlements	0.0661
International recognition and permanent borders	0.0368
Maximization of the area (land)	0.0816
Economic stability and prosperity	0.0219
East Jerusalem as the capital of Palestine	0.1361
Solve the Refugee problem	0.2128
Control of the Muslim holy places	0.0853
Palestinian costs from its concessions	
Conflict between Palestinian diaspora and the internal leadership	0.0948
Giving up the claim over historic Palestine occupied in 1948 and known later as the State of Israel	0.2055
Partial loss/depletion of natural resources by sharing them with Israel	0.1257
Loss of military capability to defend the State of Palestine	0.0575
Territorial loss as a result of unfair land swap	0.2173
Accommodation and rehabilitation of Palestinian refugees not allowed to return to Israel	0.1192
Restrictions on national sovereignty by accepting demilitarization and multinational monitoring	0.1013
Loss of property rights	0.0395
Dislocation and fragmentation of Palestinian social fabric	0.0392
Palestinian perception of Israeli benefits from Palestinian concessions	
Gaining legitimacy of the Palestinian and Arab and Muslim world	0.1111
Integration in the Middle East with normal relations with its neighbors and Arab World	0.0658
End of claims by the Palestinians	0.2556
Obtaining security by acceptance and recognition of the Palestinian and Arab and Muslim world	0.108
Sharing the Palestinians with their own natural resources	0.0215
Obtaining territorial gains	0.1184
Economic relations and new markets including tourism with neighboring Arab and Islamic countries	0.0999
Reduction of military expenditures enabling national development	0.0239
Regional cooperation against external threats	0.0333
Acknowledgement of Israeli control over the Wailing Wall and the Jewish Quarter in the Old City of Jerusalem	0.1626

6. The trade-offs of the parties are paired to decide which pairs are acceptable. Acceptable means that both parties benefit from the trade-off and that they receive more than they lose from the trade-off they give away. Acceptability of a pair of trade-offs

Table 12 Israeli and Palestinian benefits and perceived costs

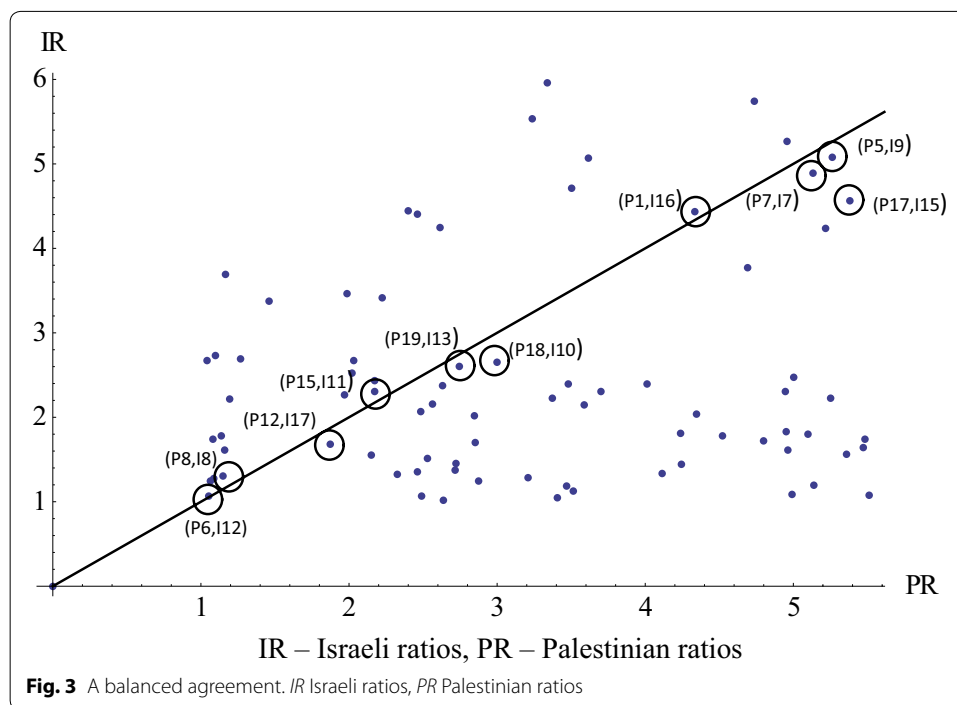
	Priorities
Israeli benefits from Palestinian concessions	
Integrity and unity of Israeli society post agreement	0.0753
Security	0.1636
Strengthening the alliance with the United States	0.0477
Make Israel more attractive to Jewish diaspora and Israelis citizens	0.0397
End of claims	0.2216
Legitimization of the State of Israel	0.0654
Stop being occupiers	0.0529
Peace, prosperity and stability in region	0.0959
Maintain the Jewish majority of Israel alongside with the Arab minority	0.1899
Weakening the radical forces in the Middle East headed by Iran	0.0479
Israeli perception of Palestinian costs from Palestinian concessions	
Giving up on the Idea of a Greater Palestine	0.088
Remainder of part of the Settlement Community	0.0964
Loss of 'victim' status	0.0288
Loss of land (67 Border)/swap	0.15
Loss of International financial support	0.0252
Partial control of East Jerusalem as the capital of Palestine	0.1735
Partial solution refuge problem	0.3101
Partial control of the Muslim holy places	0.128
Palestinian benefits from Israeli concessions	
Permanent borders	0.2095
Sovereign Palestinian State	0.2054
Share of water and other resources	0.0181
Resolution of the refugee problem	0.0654
Shared control of Jerusalem and holy places	0.0613
International guarantees and assurances to protect Palestine State security and integrity	0.0403
Evacuation of the Israeli settlements	0.0415
Having full control over air space, maritime, borders and outlets	0.1086
Release of political prisoners including those who are Israeli citizens	0.0186
Respect the integrity of West Bank and Gaza	0.0571
Stop incitement and raging hatred	0.0087
East Jerusalem as the capital of the State of Palestine	0.1654
Palestinian perception of Israeli costs from Israeli concessions	
Changing of Zionist narrative	0.4541
Property restitution and compensation	0.0689
Settlements evacuation	0.2723
Rehabilitating evacuated settlers from the Palestinian territories	0.2047

is implemented using a gain-loss ratio. Gain-loss ratios are not symmetric for the parties.

7. Acceptable pairs of trade-offs are identified with the additional condition that the gain-loss ratio of a pair of concessions is as close as possible for the parties (i.e., within a small percentage of each other). Total equality in the tradeoffs is highly unlikely because of computational imprecision.
8. If the gain-loss ratios for all the acceptable pairs of trade-offs are as close as possible, the totality of the pairs of trade-offs should be as close as possible, and the agreement should be balanced (Fig. 3).

Table 13 Evaluation of Trade-offs

Concessions	Israelis' Costs (2)	Israelis' Perception of Palestinians' Benefits (3)	Israelis' Total Loss (2)*(3)*1000	Palestinians' Benefits (5)	Palestinians' Perception of Israel's Costs (6)	Palestinians' Total Gain (5)*(6)*1000
Israelis						
1	1	1	1000	0.8875	0.9683	859.43
2	0.6445	0.7637	492.18	0.9892	0.9717	961.20
3	0.9051	0.2705	244.88	0.9565	0.7835	749.44
4	0.9470	0.8253	781.53	0.8884	0.9515	845.25
5	0.1961	0.5405	106.01	0.8008	0.7583	607.29
6	0.8824	0.4280	377.70	0.5455	0.7410	404.22
7	0.1984	0.5149	102.15	0.9838	0.9054	890.73
8	0.8299	0.8068	669.54	1	0.9692	969.17
9	0.0545	0.8205	44.75	0.9829	0.9080	892.42
10	0.1006	0.5323	53.55	0.8053	0.5459	439.65
11	0.1120	0.2853	31.96	0.6691	0.5260	351.93
12	0.8596	0.9571	822.76	0.9847	0.9075	893.59
13	0.3593	0.8915	320.31	0.9310	1	930.98
14	0.5178	0.4781	247.56	0.7528	0.6508	489.95
15	0.1633	0.6027	98.42	0.8472	0.7334	621.31
16	0.1806	0.7329	132.34	0.8884	0.9174	815.03
17	0.0741	0.1110	8.23	0.4134	0.4991	206.29
Concessions	Palestinians' Costs (2)	Palestinians' Perception of Israel's Benefits (3)	Palestinians' Total Loss (2)*(3)*1000	Israelis' Benefits (5)	Israelis' Perception of Palestinians' Costs (6)	Israelis' Total Gain (5)*(6)*1000
Palestinians						
1	0.9349	0.2000	186.95	0.9233	0.6353	586.55
2	0.8877	0.2000	177.51	0.2333	0.4743	110.66
3	0.8101	0.2000	161.99	0.7033	0.1106	77.80
4	0.8518	0.8947	762.13	0.9944	0.1660	165.08
5	0.8438	0.2000	168.74	0.7543	0.3011	227.15
6	0.9035	0.9345	844.30	0.8741	1	874.13
7	0.8635	0.2000	172.67	0.8055	0.6196	499.09
8	0.9298	0.9572	889.98	1	0.8557	855.72
9	0.8718	0.2000	174.33	0.5968	0.1353	80.74
10	0.7691	0.2331	179.27	0.7031	0.3355	235.85
11	0.8957	0.2000	179.12	0.6592	0.1096	72.28
12	0.5522	0.2000	110.42	0.3968	0.0348	13.81
13	0.6878	0.2000	137.54	0.6153	0.1119	68.87
14	0.5098	0.2000	101.95	0.4967	0.0443	22.00
15	0.8119	0.2000	162.35	0.2009	0.3663	73.61
16	1	1	1000.00	0.9251	0.6221	575.49
17	0.5796	0.2000	115.90	0.8541	0.5253	448.69
18	0.7352	0.2000	147.01	0.7583	0.1871	141.88
19	0.8621	0.3908	336.96	0.9572	0.8724	835.03
20	0.8158	0.2000	163.14	0.4069	0.0544	22.14
21	0.2000	0.2000	39.99	0.7613	0.1858	141.44



All the critical issues in the conflict: the declaration of the Pittsburgh principles

The data developed above in “Retributive conflicts and the AHP” provided a veritable trove of practical information not previously available to the participants, but based on their own judgments they were now able to understand their own and their protagonists priorities on a wide variety of issues. It became apparent as to which issue on either side had the highest priority for each side, directly asking the question as to what was most important and least important would not have yielded an accurate statement of the true priorities. The AHP approach addresses such questions in an oblique manner and creates a reality that is far more accurate than trying to achieve an accurate statement by either party. The pairwise comparison approach yielded results which gives each party the kind of understanding of the true problem that can be rarely achieved in face to face negotiations.

Armed with this data, the participants began to consider where agreement might be reached on certain general principles. It became clear that the general principles would be helpful in considering general issues. With full recognition that the devil is in the details, the participants spent considerable time in honing a set of principles that could be agreed upon, word by word, based on knowledge that the AHP approach could provide.

After long hours of interaction, the following general principles, dubbed the Pittsburgh Principles were developed. While it would be presumptuous to suggest that these principles would create a solution to the controversy, participants on both sides felt that the statement of the principles provided a great deal that had eluded the face to face negotiators. All involved understood that the most difficult task of implementing the general principles remained to be addressed. The general principles agreed upon were as follows:

1. A Two-State solution on the borders of the 4th of June 1967, with mutually agreed upon land swaps.
2. Israel must respect the integrity of the West Bank and Gaza by allowing free and safe passage between the two areas, and the Palestinian State must guarantee that any agreement reached with Israel will be accepted and supported by the majority of the Palestinian people both in Gaza and the West Bank.
3. East Jerusalem is the capital of the Palestinian State. The parties will maintain the status quo of the holy places in Jerusalem.
4. Acknowledge Israel's existence as a Jewish State, without jeopardizing the rights of its minority Israeli citizens.
5. Evacuation of Israeli settlers from the Palestinian territories that are not included in the land swap.
6. Palestinian full control of the borders of the Palestinian State and its outlets, and deployment of a temporary agreed upon multinational military monitoring system in the Jordan Valley.
7. Solve the Palestinian refugee problem in a just and agreed upon manner.
8. Limited arms of the Palestinian state and international guarantees from the international community against aggression from other parties.
9. Agreed upon international monitoring mechanism and agreed upon binding international arbitration mechanisms.
10. The full implementation of these principles concludes end of the conflict and claims of the two parties.

Implementation steps

In recent months the participants have focused exclusively on developing an implementation plan for each of the Pittsburgh Principles. The outcome of these discussions, using AHP methodology, resulted in a detailed agreement reflecting each of the Pittsburgh Principles, except for #7 which reads "solve the Palestinian refugee problem in a just and agreed upon manner". This Principle was addressed in an initial implementation mode, but was so complex that we achieved only a few agreed upon details. Several more meetings are planned to complete a fully implementable implementation plan for this principle. Nevertheless, what has been agreed upon so far addresses some of the relevant issues.

While even a detailed implementation plan will require further discussion between the parties, the participants in our study, who are significant members of the Israeli and Palestinian communities, believe that the level of detail presented below will facilitate agreement on these issues, even if some modifications are required.

Principle 1 A Two-State solution on the borders of the 4th of June 1967, with mutually agreed upon land swaps.

The first principle proved to be a difficult statement to implement because it essentially sought to determine the borders of the two entities, a very controversial issue. The participants struggled with an implementation statement, but then decided that a small subgroup would meet separately to try and agree upon the principles for land swaps.

In a meeting in October of 2013 a subcommittee of the participants met at an undisclosed location to draft implementation principles for a land swap. The entire participant group rewrote this material in the format given below.

Land swap principles

October 2013.

(Revised January 2014).

General guidelines

- A Two-State solution on the borders of the 4th of June 1967, with minimal, mutually agreed upon land swap of the same size and of equal value for both sides.
- Territorial contiguity of both states is a principle of importance for both sides.
- Land swap between the State of Israel and the State of Palestine in a manner beneficial to both sides.
- Systematic and time limited process for implementing land swap.
- No swap of land for money.
- No empty Palestinian land or land populated by Palestinians, for swap.
- Tradeoff issues that go beyond land for land could be discussed and should be mutually agreed upon.
- Maximum number of Israeli citizens and minimum Palestinian land to be annexed with proximity to the 1967 line.
- East Jerusalem is an integral part of the West Bank.
- Jewish neighborhoods built in East Jerusalem after 1967 will be part of the land swap.
- The passage between the Gaza Strip and the West Bank will be part of the land swap.

Jerusalem

Overall arching values relevant to Jerusalem.

- One city two capitals.
- The capital of the State of Palestine will be in East Jerusalem.
- Contiguity of neighborhoods for both sides (minimize isolation of communities).
- Mutually agreed arrangement for the Old City.
- Both sides will work towards agreed upon procedures and arrangements to enable the citizens of the two countries to have access to the city of Jerusalem.
- No Israeli population evacuation with the option of staying under Palestinian sovereignty as individual residents respecting and abiding by Palestinian laws.
- Palestinians living in Jewish neighborhoods in Jerusalem will not be evacuated and will live under Israeli sovereignty.
- Develop road links wherever necessary.

West Bank

- Israel is responsible to evacuate the settlers who refuse to comply with the agreement.
- The State of Palestine will take full responsibility for the safety of Israeli citizens who choose to stay under Palestinian sovereignty as residents on equal footing with its own citizens.
- The State of Israel will take full responsibility for the safety of Palestinian citizens who choose to stay under Israel sovereignty as residents on equal footing with its own citizens.
- Israel will refrain from any settlement activities in the West Bank or East Jerusalem during the implementation of the agreement.

Table 14 List of Settlements in the West Bank

Israeli settlements								
	Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc
3	Adora	278	159	Secular	1984	E	Har Hebron	West
4	Alei Zahav	462	255	Secular	1982	W	Shomron	Western S.
5	Alfei Menashe	7574	1085	Secular	1983	W	Shomron	Western S. [8]
6	Alon Shvut	3066	643	Religious	1970	W	Gush Etzion	Etzion
7	Almog	178	111	Secular	1977	V	Megilot	Dead Sea
8	Almon	1132	376	Secular	1982	W	Binyamin	Adumim
9	Arg aman	132	165	Secular	1968	V	Bik'at HaYarden	Jordan Valley
10	Ariel	18176	2479	Mixed	1978	W	Shomron	Western S. [9]
11	Asfar (Met-zad)	469	178	Orthodox	1983	E	Gush Etzion	Judean Mtns
12	Ateret	775	235	Religious	1981	E	Mateh Binyamin	Western B.
13	Avnat	119			1983	V	Megilot	Dead Sea
14	Avnei Hefetz	1614	493	Religious	1990	E	Shomron	Western S.
15	Barkan	1502	349	Secular	1981	W	Shomron	Western S.
16	Bat Ayin	1117	239	Religious	1989	W	Gush Etzion	Etzion
17	Beit Aryeh	4166	960	Secular	1981	W	Shomron	Western S. [8]
18	Beit El	5897	944	Religious	1977	E	Mateh Binyamin	[8] Ramallah
19	Beit HaArava	119	280	Secular	1980	V	Megilot	Dead Sea
20	Beit Horon	1149	181	Mixed	1977	W	Mateh Binyamin	Giv'on
21	Beit Yatir (Mezadot Yehuda)	399	170	Religious	1983	W	Har Hebron	South
22	Beitar Illit	42,467	1773	Orthodox	1985	W	Gush Etzion	Etzion [9]
23	Beka'ot	175	120	Secular	1972	V	Bik'at HaYarden	Jordan Valley
24	Carmei Tzur	872	160	Religious	1984	E	Gush Etzion	Etzion
25	Carmel	378	177	Religious	1981	E	Har Hebron	South
26	Dolev	1306	355	Religious	1983	E	Mateh Binyamin	Western B.
27	East Talpiot	13,984	1195	Secular	1967	W	Jerusalem	East Jerusalem
28	Efrat(a)	7812	1090	Religious	1980	W	Gush Etzion	Etzion [8]
29	El'azar	2302	256	Religious	1975	W	Gush Etzion	Etzion
30	Eli	3521	776	Mixed	1984	E	Shomron	Eli
31	Elkana	3860	758	Religious	1977	W	Shomron	Western S. [8]
32	Elon Moreh	1632	419	Religious	1979	E	Shomron	Nablus
33	Immanuel	3660	328	Orthodox	1983	W	Shomron	Western S. [8]
34	Einav	662	158	Religious	1981	E	Shomron	Enav
35	Eshkolot	510	133	Secular	1982	W	Har Hebron	South
36	Etz Efraim	864	184	Mixed	1985	W	Shomron	Western S.

Table 14 continued

Israeli settlements								
	Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc
37	French Hill (Giv'at Shapira)	8660	2018	Secular	1969	W	Jerusalem	East Jerusalem
38	Ganim				1983	E	Shomron	Northern S.
39	Geva Binyamin (Adam)	4674	728	Secular	1984	E	Mateh Binyamin	Ramallah
40	Gilual, Bik'at HaYarden	167	570	Secular	1970	V	Bik'at HaYarden	Jordan Valley
41	Gilo	29,559	2859	Secular	1973	W	Jerusalem	East Jerusalem
42	Gitit	308	113	Secular	1973	V	Bik'at HaYarden	Jordan Valley
43	Giv'at Hamivtar	2944			1970	W	Jerusalem	East Jerusalem
44	Giv'at Ze'ev	13,466	1063	Secular	1983	W	Mateh Binyamin	[8] Giv'on
45	Giv'on Hadasa	1131	226	Secular	1980	W	Mateh Binyamin	Giv'on
46	Hagai	541	233	Religious	1984	E	Har Hebron	Hebron
47	Hallamish	1144	450	Religious	1977	E	Mateh Binyamin	Western B.
48	Hamra	110	133	Secular	1971	V	Bik'at HaYarden	Jordan Valley
49	Har Adar (Giv'at Ha Radar)	3701	969	Secular	1986	W	Mateh Binyamin	[8] Giv'on
50	Har Brakha	1769	258		1983	E	Shomron	Nablus
51	Har Gilo	952	127	Secular	1972	W	Gush Etzion	Etzion
52	Har Homa, Givat Hamatos	9811	2523/310	Religious	1997	W	Jerusalem	East Jerusalem
53	Hashmonaim	2573	835	Religious-Orthodox	1985	W	Mateh Binyamin	Modi'in
54	Hebron	850			1980	E	Har Hebron	Hebron [11]
55	Hemdat (Nahal)	186	82	N/A	1980	V	Bik'at HaYarden	Jordan Valley
56	Hermesh	189	134	Secular	1982	E	Shomron	Rehan
57	Hinanit	945	280	Mixed	1981	W	Shomron	Rehan
58	Homesh	0	157	Secular	1980	E	Shomron	Northern S.
59	Itamar	1024	253	Religious	1984	E	Shomron	Nablus
60	Kadim	0	148	Secular	1983	E	Shomron	Northern S.
61	Kalia	360	537	Secular	1968	V	Megilot	Dead Sea
62	Karnei Shomron	6570	1351	Mixed	1978	W	Shomron	Western S. [8]
63	Kedar	1246	251	Secular	1985	W	Gush Etzion	Adumim
64	Kedumim	4124	1003	Mixed	1977	W	Shomron	Kedumim [8]
65	Kfar Adumim	3527	921	Mixed	1979	W	Mateh Binyamin	Adumim
66	Kfar Etzion	975	445	Religious	1967	W	Gush Etzion	Etzion
67	Kfar Tapuach	1207	156	Religious	1978	E	Shomron	Western S.
68	Kiryat Arba	7593	882	Mixed	1972	E	Har Hebron	Hebron [8]

Table 14 continued

Israeli settlements								
	Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc
69	Kiryat Netafim	749	162	Religious	1983	W	Shomron	Western S.
70	Kokhav HaShahar	1548	586	Religious	1977	V	Mateh Binyamin	Jordan
71	Kokhav Ya'akov (Abir Ya'akov)	6476	756	Religious	1985	E	Mateh Binyamin	Ramallah
72	Lapid	2543	386	Secular	1996	W	Hevel Modi'in	Modi'in
73	Ma'ale Adumim	36,862	3589	Mixed	1975	W	Gush Etzion [9]	Adumim
74	Ma'ale Amos	350	155	Orthodox	1981	E	Gush Etzion	Judean Mtns
75	Ma'ale Efraim	332	521	Secular	1970	V	Bik'at HaYarden [8]	Jordan Valley
76	Ma'ale Levona	1119	251	Religious	1983	E	Mateh Binyamin	Eli
77	Ma'ale Mikhmas	724	383	Religious	1981	V	Mateh Binyamin	
78	Ma'ale Shomron	1251	216	Mixed	1980	W	Shomron	Western S.
79	Ma'alot Dafna	2720	380	Secular	1972	W	Jerusalem	East Jerusalem
80	Ma'on	454	173	Religious	1981	E	Har Hebron	South
81	Maskiot	132	32		1986	V	Bik'at HaYarden	Jordan Valley
82	Massu'a	153	160	Secular	1970	V	Bik'at HaYarden	Jordan Valley
83	Matityahu	568	195	Religious	1981	W	Mateh Binyamin	Modi'in
84	Mehola	429	190	N/A	1968	V	Bik'at HaYarden	Jordan Valley
85	Mekhora	112	132	Secular	1973	V	Bik'at HaYarden	Jordan Valley
86	Menora	2644	453	Secular	1998	W	Mateh Binyamin	Modi'in
87	Mevo Dotan	276	122	Secular	1978	E	Shomron	Rehan
88	Mevo Horon	2147	519	Religious	1970	W	Mateh Binyamin	Modi'in
89	Migdal Oz	512	576	Religious	1977	W	Gush Etzion	Etzion
90	Migdalim	147	130	Secular	1983	E	Shomron	Western S.
91	Mishor Adumim		1550					Adumim
92	Mitzpe Shalem	173	151	Secular	1971	V	Megilot	Dead Sea
93	Mitzne Yericho	2115	564	Religious	1978	V	Mateh Binyamin	Jordan
94	Modi'in Illit	55,494	1606	Orthodox	1996	W	Mateh Binyamin	Modi'in [8]
95	Na'ale	1203	349	Secular	1988	E	Mateh Binyamin	
96	Nahliel	496	114	Orthodox	1984	E	Mateh Binyamin	Western B.

Table 14 continued

Israeli settlements								
Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc	
97	Negohot	258	90	Religious	1999	E	Har Hebron	West
98	Nativ HaG-dud	162	1042	Secular	1976	V	Bik'at HaYarden	Jordan Valley
99	Neve Daniel	2058	263	Religious	1982	W	Gush Etzion	Etzion
100	Neve Yaakov	19,703	1759	Secular	1972	W	Jerusalem	East Jerusalem
101	Nili	968	282	Secular	1981	E	Mateh Binyamin	
102	Niran	69	302	Secular	1977	V	Bik'at HaYarden	Jordan Valley
103	Nofim	437	248	Secular	1987	W	Shomron	Western S.
104	Nokdim	1561	440	Mixed	1982	E	Gush Etzion	Judean Mtns
105	Na'omi	98	280	Secular	1982	V	Bik'at HaYarden	Jordan Valley
106	Ofarim	n/a	351	Secular	1989	W	Mateh Binyamin	
107	Ofra	3489	1012	Religious	1975	E	Mateh Binyamin	Ramallah
108	Old City Jewish Quarter	3105	156	Orthodox			Jerusalem	East Jerusalem
109	Oranit	7195	878	Mixed	1985	W	Shomron	Western S. [8]
110	Otniel	927	291	Religious	1983	E	Har Hebron	South
111	Peduel	1315	171	Religious	1984	W	Shomron	Western S.
112	Ma'ale Hever (Peneh Hever)	398	110	Religious	1982	E	Mateh Binyamin	Ramallah
113	Peza'el	216	319	Secular	1975	V	Bik'at HaYarden	Jordan Valley
114	Pisgat Ze'ev	44,512	5467	Secular	1985	W	Jerusalem	East Jerusalem
115	Psagot	1728	234	Religious	1981	E	Har Hebron	Hebron
116	Ramat Eshkol	3573	682	Secular	1970	W	Jerusalem	East Jerusalem
117	Ramat Shlomo	14,554	741	Orthodox	1995	W	Jerusalem	East Jerusalem
118	Ramot Alon	41,410	2558	Orthodox	1974	W	Jerusalem	East Jerusalem
119	Rehan	174	90	Secular	1977	W	Shomron	Rehan
120	Revava	1545	160	Religious	1991	W	Shomron	Western S.
121	Rimonim	572	314	Secular	1977	V	Mateh Binyamin	Jordan
122	Ro'i	154	134	Secular	1976	V	Bik'at HaYarden	Jordan Valley
123	Rosh Tzurim	855	320	Religious	1969	W	Gush Etzion	Etzion
124	Sanhedria Murhevet	4094	378		1970	W	Jerusalem	East Jerusalem
125	Sa-Nur	0	44	Secular	1982	E	Shomron	Northern S.
126	Sal'it	542	256	Secular	1977	W	Shomron	Enav
127	Sha'are Tikva	5100	915	Mixed	1983	W	Shomron	Western S.
128	Shadmot Mehola	512	159	N/A	1979	V	Bik'at HaYarden	Jordan Valley

Table 14 continued

Israeli settlements								
Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc	
129	Shaked	724	206	Secular	1981	W	Shomron	Rehan
130	Shani	430	30	Secular	1989	W	Har Hebron	South
131	Shavei Shomron	745	272	Religious	1977	E	Shomron	Western S.
132	Shilo	2706	482	Religious	1979	E	Mateh Binyamin	Eli
133	Shim'a	375	212	Secular	1985	E	Har Hebron	South
134	Shvut Rachel	400			1991	E	Mateh Binyamin	Eli
135	Susiya	950	352	Religious	1983	E	Har Hebron	South
136	Talmon	3202	1135	Religious	1989	E	Mateh Binyamin	Western B.
137	Tekoa	2518	402	Mixed	1977	E	Gush Etzion	Judean Mtns
138	Telem	241	117	Secular	1982	E	Har Hebron	West
139	Tene Omarim	658	272	Secular	1983	E	Har Hebron	South
140	Tomer	228	362	Secular	1978	V	Bik'at HaYarden	Jordan Valley
141	Vered Jericho	221	274	Secular	1980	V	Megilot	Dead Sea
142	Yafit	124	352	Secular	1980	V	Bik'at HaYarden	Jordan Valley
143	Yakir	1645	342	Religious	1981	W	Shomron	Western S.
144	Yitav	195	170	Secular	1970	V	Bik'at HaYarden	Jordan Valley
145	Yitzhar	1172	269	Religious	1983	E	Shomron	Nablus
146	Zofin	1484	219	Mixed	1989	W	Shomron	Kedumim

Today there are 144 Israeli settlements in the West Bank (see Table 14) and an unknown number of outposts. Israel wants to annex 43 of the settlements in exchange for land in other parts of Israel (see Table 15). The other settlements will have to be disposed of appropriately. These settlements contain about 74.58 % of the population in the settlements, and cover an area of approximately 3.1 % of the area of the West Bank or 182 sq. km. The maps in Figs. 4 and 5 show the settlements in Table 10 (marked in yellow) to be annexed by Israel in this solution.

Figure 6 contains the map of territories proposed by Israeli participants for land swap in exchange for the territories annexed in Table 15 and depicted in Figs. 4 and 5. The proposed land swap alternatives were evaluated in Table 16.

Result

The total area to be annexed by Israel is 3.1 % of the West Bank or 182 km². The corresponding land from the sites prioritized above is selected by using the quality points from the final scores as follows: Beit Shean Valley (18 km²), Gaza Envelop (67.7 km²), Judea Plain (63.4 km²) and Northern Negev (32.9 km²).

Principle 2 Israel must respect the integrity of the West Bank and Gaza by allowing free and safe passage between the two areas, and the Palestinian State must guarantee

Table 15 List of settlements in the West Bank to be annexed by Israel

Israeli settlements								
Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc	Under Israeli Flag
Alfei Menashe	7574	1085	Secular	1983	w	Shomron	Western S. [8]	y
Alon Shvut	3066	643	Religious	1970	w	Gush Etzion	Etzion	y
Bat Ayin	1117	239	Religious	1989	w	Gush Etzion	Etzion	y
Beit Yatir (Mezadot Yehuda)	399	170	Religious	1983	w	Har Hebron	South	y
Beitar Illit	42,467	1773	Orthodox	1985	w	Gush Etzion	Etzion [9]	y
East Talpiot	13,984	1195	Secular	1967	w	Jerusalem	East Jerusalem	y
Efrat(a)	7812	1090	Religious	1980	w	Gush Etzion	Etzion [8]	y
El'azar	2302	256	Religious	1975	w	Gush Etzion	Etzion	y
Elkana	3860	758	Religious	1977	w	Shomron	Western S. [8]	y
Eshkolot	510	133	Secular	1982	w	Har Hebron	South	y
Etz Efraim	864	184	Mixed	1985	w	Shomron	Western S.	y
French Hill (Giv'at Shapira)	8660	2018	Secular	1969	w	Jerusalem	East Jerusalem	y
Gilo	29,559	2859	Secular	1973	w	Jerusalem	East Jerusalem	y
Giv'at Hamivtar	2944			1970	w	Jerusalem	East Jerusalem	y
Giv'at Ze'ev	13,466	1063	Secular	1983	w	Mateh Binyamin	[8] Giv'on	y
Giv'on Hadasha	1131	226	Secular	1980	w	Mateh Binyamin	Giv'on	y
Har Adar (Giv'at HaRadar)	3701	969	Secular	1986	w	Mateh Binyamin	[8] Giv'on	y
Har Homa, Givat Hamatos	9811	2523/310	Religious	1997	w	Jerusalem	East Jerusalem	y
Hashmonaim	2573	835	Religious-Orthodox	1985	w	Mateh Binyamin	Modi'in	y
Hinanit	945	280	Mixed	1981	w	Shomron	Rehan	y
Kfar Etzion	975	445	Religious	1967	w	Gush Etzion	Etzion	y
Lapid	2543	386	Secular	1996	w	Hevel Modi'in	Modi'in	y
Ma'ale Adumim	36,862	3589	Mixed	1975	w	Gush Etzion [9]	Adumim	y
Ma'alot Dafna	2720	380	Secular	1972	w	Jerusalem	East Jerusalem	y

Table 15 continued

Israeli settlements								
Name	Population 2012	Builtup area (Dunums)	Character	Est.	Fence [7]	Council	Subarea or bloc	Under Israeli Flag
Matitvahu	568	195	Religious	1981	w	Mateh Binyamin	Modi'in	y
Menora	2644	453	Secular	1998	w	Mateh Binyamin	Modi'in	y
Migdal Oz	512	576	Religious	1977	w	Gush Etzion	Etzion	y
Modi'in Illit	55494	1606	Orthodox	1996	w	Mateh Binyamin	Modi'in [8]	y
Neve Daniel	2058	263	Religious	1982	w	Gush Etzion	Etzion	y
Neve Yaakov	19,703	1759	Secular	1972	w	Jerusalem	East Jerusalem	y
Oranit	7195	878	Mixed	1985	w	Shomron	Western S. [8]	y
Pisgat Ze'ev	44,512	5467	Secular	1985	w	Jerusalem	East Jerusalem	y
Ramat Eshkol	3573	682	Secular	1970	w	Jerusalem	East Jerusalem	y
Ramat Shlomo	14,554	741	Orthodox	1995	w	Jerusalem	East Jerusalem	y
Ramot Alon	41,410	2558	Orthodox	1974	w	Jerusalem	East Jerusalem	y
Rehan	174	90	Secular	1977	w	Shomron	Rehan	y
Rosh Tzurim	855	320	Religious	1969	w	Gush Etzion	Etzion	y
Sanhedria Murhevet	4094	378		1970	w	Jerusalem	East Jerusalem	y
Sal'it	542	256	Secular	1977	w	Shomron	Enav	y
Sha'are Tikva	5100	915	Mixed	1983	w	Shomron	Western S.	y
Shaked	724	206	Secular	1981	w	Shomron	Rehan	y
Shani	430	30	Secular	1989	w	Har Hebron	South	y
Zofin	1484	219	Mixed	1989	w	Shomron	Kedumim	y
Total (excl. East Jerusalem):	345,037		Total Dunums					
			74,681					
		West Bank Area	5,876,000					
		Annexed Area	182,156	3.1 %				
		Built up Area	38,168	0.650 %				
		Population	405,471	74.58 %				
		Relocated	138,195	25.42 %				

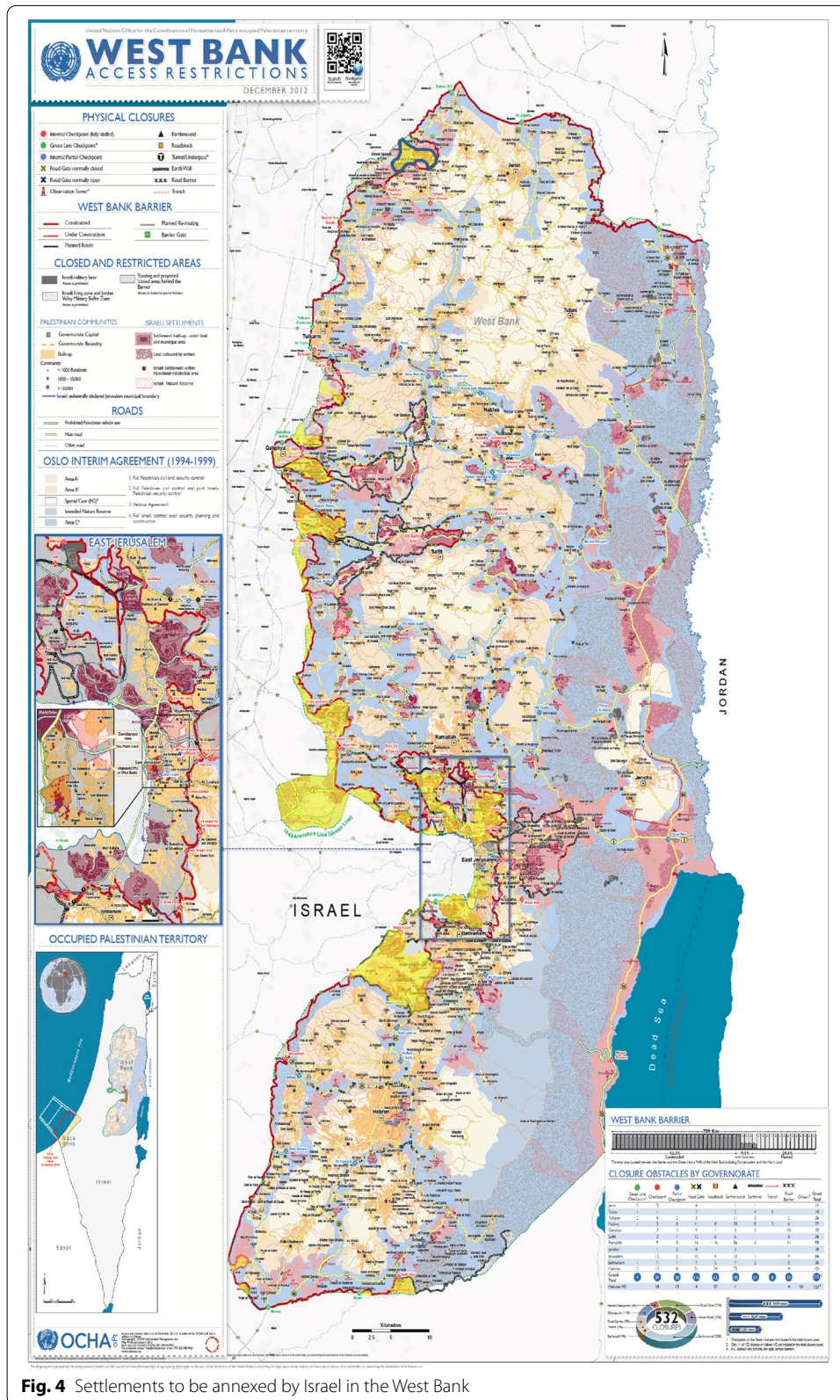
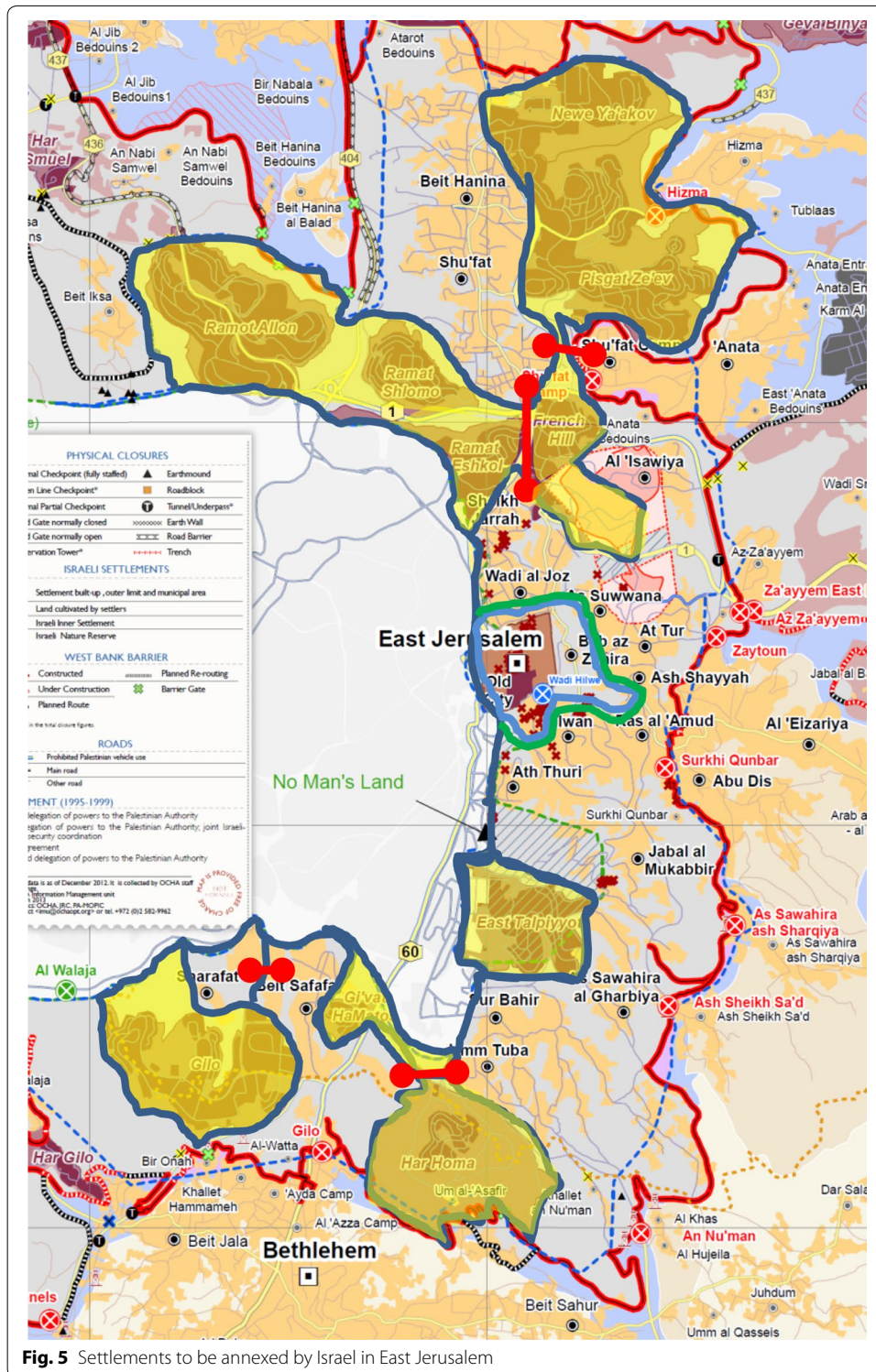
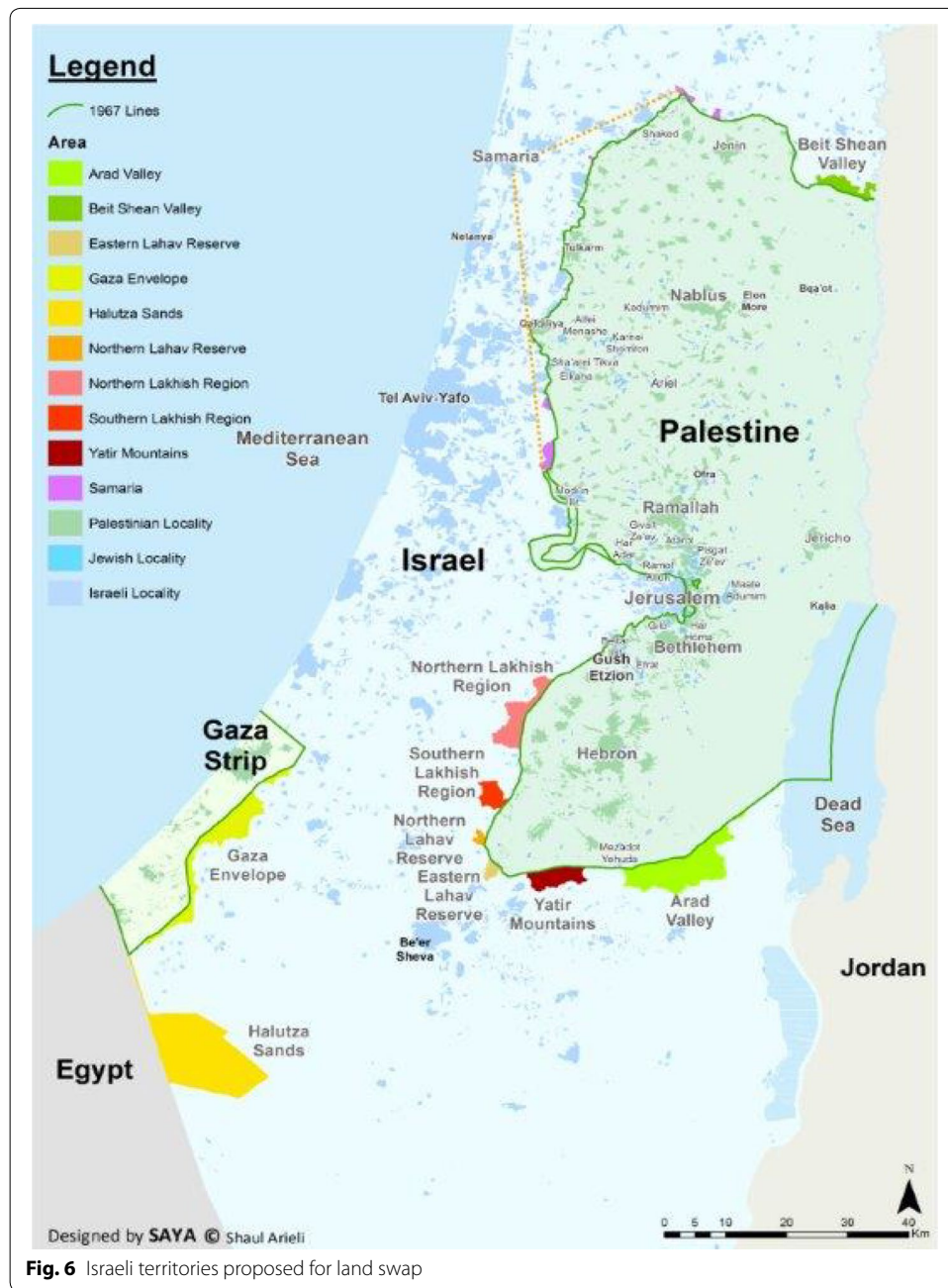


Fig. 4 Settlements to be annexed by Israel in the West Bank



that any agreement reached with Israel will be accepted and supported by the majority of the Palestinian people both in Gaza and the West Bank.

The implementation of Principle 2 reflects the feeling of both parties that any peace agreement should be subject to a referendum in each society so that the will of the



people of both communities becomes apparent. The consensus of the representatives from both sides was that a significant proportion of their respective populations desired peace, if given the opportunity on a plan their leaders approve. Further, the Israeli representatives agreed that there should be free passage between Gaza and the West Bank without any restrictions in moving from one area to the other. This meant that some sort of corridor over Israeli land would be required.

Principle 3 East Jerusalem is the capital of the Palestinian State. The parties will maintain the status quo of the holy places in Jerusalem.

The participants agreed on the following principles for the historic area of Jerusalem.

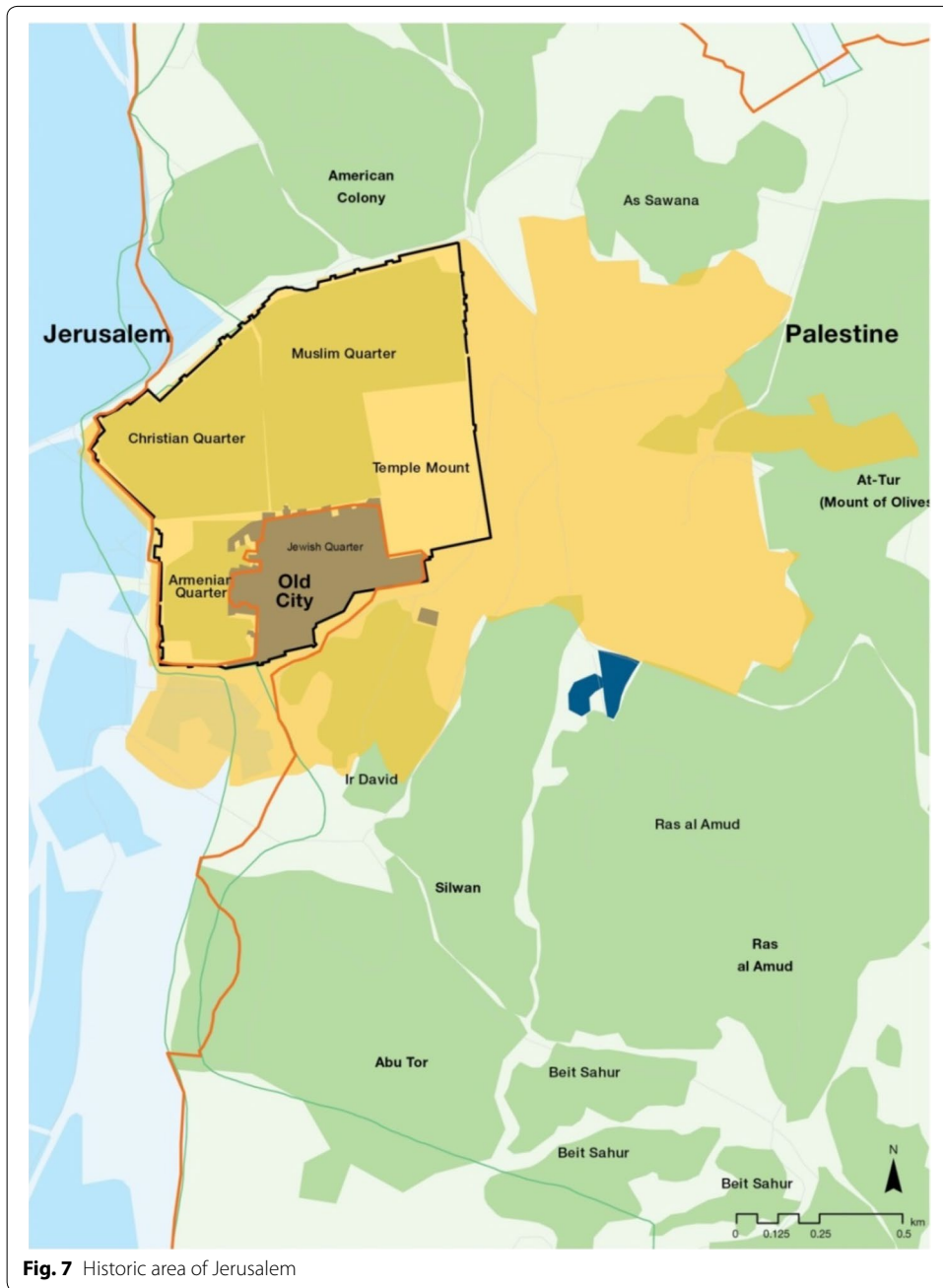
Table 16 Land swap evaluation

Criteria:	Area (km ²)	Natural resources	Goal: evaluation of land swap						Final scores
			Size (0.02)	Location (0.28)	Infra-structure (0.05)	Natural resources (0.29)	Ter-ritorial conti-guity (0.29)	Potential for devel-opment (0.06)	
Alternatives:									
Beit Shean Valley	18	Orchards green-houses veg-etables fisheries	0.6	0.79	0.86	0.79	0.9	0.95	0.83
Judea Plain		Agriculture pasture lands	0.8	0.79	0.56	0.56	0.79	0.82	0.71
Northern Lakhish Region	37.3								
Southern Lakhish Region	16.2								
Northern Lahav Reserve	3.8								
Eastern Lahav Reserve	6.1								
Northern Negev			0.6	0.5	0.21	0.38	0.5	0.44	0.45
Arad Valley	93.5	Forestry Agri-culture Nature Reserve							
Yatir Moun-tains	26.9	Vineyards							
Gaza Envelop	67.7	Orchards green-houses veg-etables nature reserve	0.9	0.82	0.69	0.75	0.86	0.86	0.81
Halutza Sands	178.1	Aquifer	0	0	0	0	0	0.06	0

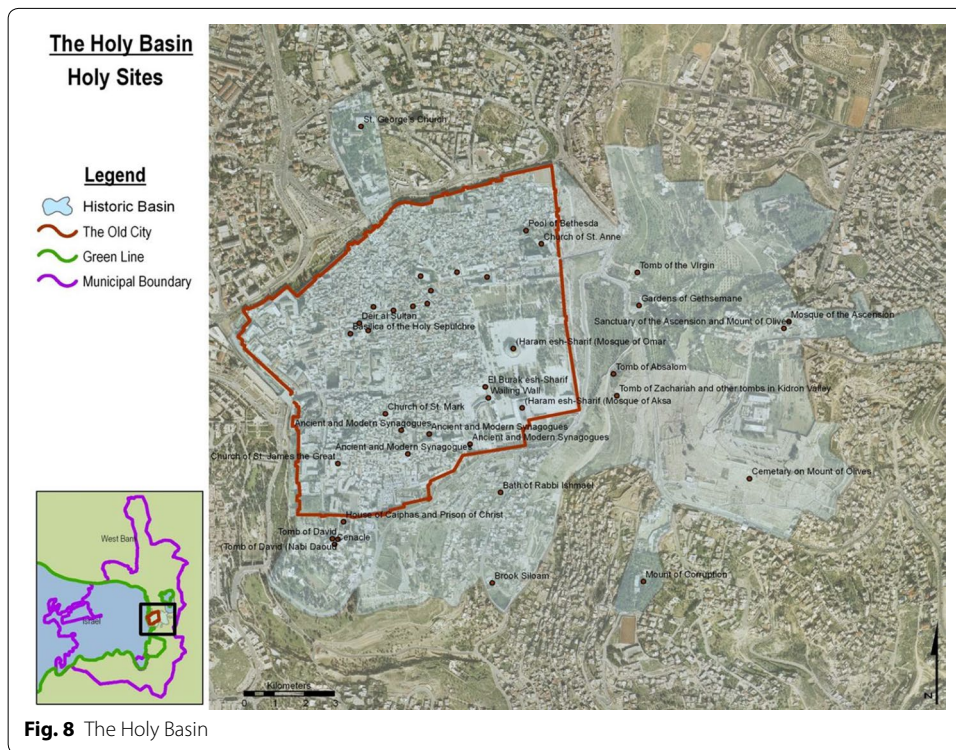
Evaluation of the five locations for land swap in terms of their potential to fulfill the five criteria listed

Principles and special arrangements for the historic area of Jerusalem

1. The ‘Historic Area’ includes Mt. Zion, the Kidron Valley, the Jewish Cemetery in the Mt. of Olives, the City of King David and the Old City as shown in Fig. 7.
2. This area will function in the model of “Open City”. Citizens of either party may not exit this area into the territory of the other party.
3. Upon the implementation of the principles, Palestine will assume sovereignty over the entire area, excluding the Jewish Quarter and Mount Zion (as in Fig. 8).
4. Palestinians will have control over the Haram al-Sharif and Israelis will have control over the Wailing Wall (no one will have sovereignty over these sites).
5. The religious status quo and particularly the existing arrangements pertaining to the exercise of religious practices will remain.



6. The implementation of these principles will be carried out according to the following three stages. A detailed time table will be agreed upon by the parties:
 - a. Redeployment of the Israeli Defense Forces and Israeli population from the Palestinian areas.
 - b. A multinational force will help assume responsibility in the territory pertaining to the Palestinians.
 - c. The State of Palestine assumes full control over its part of the area.



In addition, to the agreed upon facts noted above, the participants developed a series of actions (concessions) for each side. Next, the concessions were prioritized with respect to the benefits, costs, perceived benefits and perceived costs. Tables 17 and 18 summarize the priorities assigned and represent the judgments of the participants using the ratings approach of the AHP.

The priorities of the concessions with respect to the benefits, costs, perceived benefits and perceived costs (see Table 19) are combined to produce the gain ratios used to make trade-offs among the concessions. In this principle a pair of concessions, considered as a bundle, is traded as shown below.

As a result of these matched concessions the actions to be required of each party will be as follows:

Israeli actions

- Rescind all legal and administrative measures and orders legislated by Israel since 1967.
- Preserve and respect the status quo of the holy places in the city as decreed and accepted by the Ottomans and the international community in 1856.

Palestinian actions

- Full Palestinian cooperation during transfer of power and beyond it.
- Acceptance of international monitoring on the compliance of the transfer of power process.

Principle 4 Acknowledge Israel's Existence as a Jewish State without jeopardizing the rights of its minority Israeli citizens.

Table 17 Summary of assigned priorities (Israeli perspective) for Principle 3

Israeli benefits from Palestinian concessions	Priorities	P1	P2	
Accepting the global recognition of Jerusalem (in its new borders) as the capital of Israel	0.2812	0.6	0.688	
Increasing international and regional support for Israel	0.1508	0.75	0.663	
Transfer of full governmental and municipal responsibility for the Palestinian residents of Eastern Jerusalem, while sharing social costs	0.0587	0	0	
Security	0.0481	0	0	
Receiving international legitimization to the Jewish neighborhood in East Jerusalem	0.2189	0.625	0.575	
Strengthen Israeli democracy	0.2423	0.438	0.055	
		0.5246	0.4324	
Israeli costs from Israeli concessions	Priorities	I1	I2	I3
Hurting the feelings of the global Jewish people by conceding on the right of Jews to live everywhere in Jerusalem	0.2255	0.402	0.875	0.12
Increasing potential friction due to the dual management of the city, increasing inefficiencies	0.1582	0.173	0.967	0.12
Hindering the ability to effectively zone and plan super-infrastructure inside and around Jerusalem	0.0954	0.283	0.533	0.287
Loss of security control	0.4271	0.317	0.587	0.67
Loss of demographic control	0.0938	0.37	0.503	0.553
		0.3152	0.6989	0.4115
Israeli perception of Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3
Fulfill our national aspiration and dignity	0.3699	0.503	0.667	0.637
Enforcing the Palestinian national identity	0.2964	0.587	0.367	0.587
Free worship of the three monotheistic religions	0.0562	0	0	0
Social benefit by preserving the social fabric	0.1266	0.387	0.07	0.203
Economic benefit by developing the tourism industry and other aspects of life in the city	0.1509	0.1	0.07	0.583
		0.4241	0.3747	0.5232
Israeli perception of Palestinian costs from Palestinian concessions	Priorities	P1	P2	
Political costs by accepting compromise within the land swap approach on parts of the city where Israeli settlements exist	0.5905	0.883	0.367	
Limiting the potential urban, economic and social development of the city arising from the existence of Israeli settlements interlocked within the Palestinian capital	0.4095	0.317	0.337	
		0.6513	0.3544	
Palestinian actions				
P1. Full Palestinian cooperation during transfer of power and beyond it				
P2. Accepting international monitoring on the compliance of the transfer of power process				

This principle does not deny non-Jewish Israeli citizens the full rights of Israeli citizenship.

Principle 5 Evacuation of Israeli settlers from the Palestinian territories who are not included in the land swap (see Tables 20, 21 and 22).

Israeli perspective

Benefits

1. Security benefits.
2. Social and economic benefits.

Table 18 Summary of Assigned Priorities (Palestinian Perspective) for Principle 3

Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3
Fulfill our national aspiration and dignity	0.2989	1	1	1
Enforcing the Palestinian national identity	0.4114	1	1	1
Free worship of the three monotheistic religions	0.0901	1	0.9	1
Social benefit by preserving the social fabric	0.0679	0.9	0.9	0.9
Economic benefit by developing the tourism industry and other aspects of life in the city	0.1317	1	1	0.9
		0.9932	0.9842	0.98
Palestinian costs from Palestinian concessions	Priorities	P1	P2	
Political costs by accepting compromise within the land swap approach on parts of the city where Israeli settlements exist	0.125	0.5	0.5	
Limiting the potential urban, economic and social development of the city arising from the existence of Israeli settlements interlocked within the Palestinian capital	0.875	1	0.5	
		0.9375	0.5	
Palestinian perceptions of Israeli benefits from Palestinian concessions	Priorities	P1	P2	
Accepting the global recognition of Jerusalem (in its new borders) as the Capital of Israel	0.5039	0.9	0.9	
Increasing international and regional support for Israel	0.065	0.9	0.75	
Transfer of full governmental and municipal responsibility for the Palestinian residents of Eastern Jerusalem, while sharing social costs	0.0352	0.9	0.9	
Security	0.114	0.9	0.75	
Receiving international legitimization to the Jewish neighborhood in East Jerusalem	0.2616	0.9	0.75	
Strengthen Israeli democracy	0.0204	0.5	0.5	
		0.8919	0.8258	
Palestinian perceptions of Israeli costs from Israeli concessions	Priorities	I1	I2	I3
Hurting the feelings of the global Jewish people by conceding on the right of Jews to live everywhere in Jerusalem	0.2561	0.9	0.9	0.5
Increasing potential friction due to the dual management of the city, increasing inefficiencies	0.2519	0.75	0.5	0.5
Hindering the ability to effectively zone and plan super-infrastructure inside and around Jerusalem	0.2046	0.75	0.75	0.75
Loss of security control	0.1642	0.25	0.25	0.5
Loss of demographic control	0.1233	0.01	0.01	0.01
		0.6151	0.5521	0.4908
Israeli actions				
I1. Rescind all legal and administrative measures and orders legislated by Israel since 1967				
I2. Preserve and respect the status quo of the holy places in the city as decreed and accepted by the Ottomans and the international community in 1856.				
I3. Demolish the separation wall around the city erected by Israel				

3. Increase in the effectiveness of military and police forces.
4. Allow Israel to define its borders.
5. Increased international support.
6. Strengthen the democratic nature of the state of Israel.

Costs

1. Economic cost to relocate the settlers.
2. Rift in the Israeli society, danger of civil war/Jewish terror.

Table 19 Israeli, Palestinian benefits and costs, perceived benefits and costs, and gain ratios for Principle 3

Concessions	Israelis' costs	Israelis' perception of Palestinians' benefits	Israelis' total loss	Palestinians' benefits	Palestinians' perception of Israelis' costs	Palestinians' total gain
Israelis						
1	0.45099442	0.810588685	365,570.9737	1	1	1,000,000
2	1	0.716169725	716,169.7248	0.990938381	0.89757763	889,444.1231
3	0.588782372	1	588,782.3723	0.986709625	0.797919038	787,314.3947
Concessions	Palestinians' costs	Palestinians' perception of Israelis' benefits	Palestinians' total loss	Israelis' benefits	Israelis' perception of Palestinians' costs	Israelis' total gain
Palestinians						
1	1	1	1,000,000	1	1	1,000,000
2	0.533333333	0.925888553	493,807.228	0.824247045	0.544142484	448,507.8349
	P1	P2		Concessions	Gain	
Israeli ratios						
I1	2.735446936	1.226869383	Trade-off			
I2	1.396317054	0	Israeli	1, 2	2.735	
I3	1.698420413	0	Palestinian	1, 2	2.801	
	P1	P2				
Palestinian ratios						
I1	1	2.025081739				
I2	0	1.801197052				
I3	0	1.594376003				

Note that the Israeli bundle consisting of the pairs (I1, P1) and (I2, P2) yielding a gain of 2.735 is matched with the Palestinian bundle consisting of the pairs (I1, P1) and (I2, P2) yielding a gain of 2.801, which is within 2.5 % of each other, which is an acceptable ratio. Please note that the Israeli and Palestinian actions are listed in Tables 17 and 18, respectively

3. Erosion of national ethos.
4. Puts a large strain on the Israeli democratic character.

Palestinian actions

1. Allowing Israel to choose between incremental and rapid removal of settlers/settlements.
2. A Palestinian commitment to fully collaborate with Israel during the relocation process and maintain a restrained approach toward the actual relocation.
3. Acknowledging the value of infrastructure, residential and commercial buildings and facilities, after Israeli withdraw.

Palestinian perspective

Benefits

1. Repossession of land and natural resources.
2. Eliminate the harassment by the settlers.
3. Ability to develop the Palestinian agriculture and urban development.
4. Security (feel more secure in the absence of settlers).

5. Psychological and social benefits.
6. Ensuring geographic and integral contiguity.

Costs

1. Repair the damage caused by the settlers during evacuation.
2. Rehabilitation of the land and the facilities.

Israeli Actions

1. Ensure that the infrastructure is preserved.
2. Facilitate the evacuation without causing any damage to the properties or land.
3. Secure the evacuation process in regard to the Palestinian population.

Table 20 Israeli benefits, costs, perceived benefits and perceived costs for Principle 5

Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3
Security benefits	0.0461	0.825	0.788	0.725
Social and Economic benefits	0.109	0.788	0.275	0.115
Increase in the effectiveness of military and police forces	0.0585	0.588	0.825	0.078
Allow Israel to define its borders	0.2023	0.313	0.4	0.078
Increased international support	0.1837	0.213	0.788	0.033
Strengthen the democratic nature of the state of Israel	0.4004	0.563	0.563	0.01
		0.4858	0.5653	0.0762
Israeli costs from Israeli concessions	Priorities	I1	I2	I3
Economic cost to relocate the settlers	0.1282	0.563	0.563	0.275
Rift in the Israeli society, danger of civil war/Jewish terror	0.5261	0.5	0.5	0.75
Erosion of national ethos	0.1208	0.788	0.6	0.4
Puts a large strain on the Israeli democratic character	0.2248	0.275	0.5	0.5
		0.4922	0.5201	0.5906
Israeli perception of Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3
Repossession of land and natural resources	0.3167	0.862	0.725	0.563
Eliminate the harassment by the settlers	0.0775	0.75	0.5	0.888
Ability to develop the Palestinian agriculture and urban development	0.15	0.85	0.725	0.438
Security (feel more secure in the absence of settlers)	0.1171	0.463	0.95	0.863
Psychological and social benefits	0.0909	0.625	0.725	0.825
Ensuring geographic and integral contiguity	0.2478	0.175	0.01	0.055
		0.6131	0.5567	0.5021
Israeli perception of Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3
Repair the damage caused by the settlers during evacuation	0.5074	0.193	0.825	0.115
Rehabilitation of the land and the facilities	0.4926	0.3	0.788	0.4
		0.2455	0.8065	0.2554
Palestinian actions				
P1. Allowing Israeli to choose between incremental and rapid removal of settlers/settlements				
P2. A Palestinian commitment to fully collaborate with Israeli during the relocation process and maintaining a restrained approach toward the actual relocation				
P3. Acknowledging the value of infrastructure, residential and commercial buildings and facilities, after Israeli withdrawal				

Table 21 Palestinian benefits, costs, perceived benefits and perceived costs for Principle 5

Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3
Repossession of land and natural resources	0.4034	0.9	0.9	0.9
Eliminate the harassment by the settlers	0.0552	0	0	0
Ability to develop the Palestinian agriculture and urban development	0.0967	0.9	0.9	0.9
Security (feel more secure in the absence of settlers)	0.1647	0.75	0.75	0.9
Psychological and social benefits	0.0196	0	0	0
Ensuring geographic and integral contiguity	0.2604	0.9	0.9	0.75
		0.808	0.808	0.7936
Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3
Repair the damage caused by the settlers during evacuation	0.5	1	0.5	0.9
Rehabilitation of the land and the facilities	0.5	1	0.75	0.75
		1	0.625	0.825
Palestinian perceptions of Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3
Security benefits	0.5537	0.5	0.75	0.9
Social and economic benefits	0.1119	0.75	0.75	0.75
Increase in the effectiveness of military and police forces	0.0553	0	0	0
Allow Israel to define its borders	0.2534	0.5	0.01	0.01
Increased international support	0.0258	0	0	0
		0.4874	0.5017	0.5848
Palestinian perceptions of Israeli costs from Israeli concessions	Priorities	I1	I2	I3
Economic cost to relocate the settlers	0.6505	0.75	0.5	0.75
Rift in the Israeli society, danger of civil war/Jewish terror	0.1557	0.75	0.75	0.75
Erosion of national ethos	0.0468	0.25	0.25	0.25
Puts a large strain on the Israeli democratic process	0.147	0.01	0.01	0.01
		0.6178	0.4552	0.6178
Israeli actions				
I1. Ensure that the infrastructure is preserved				
I2. Facilitate the evacuation without causing any damage to the properties or land				
I3. Secure the evacuation process in regard to the Palestinian population				

As a result of these matched concessions the actions to be required of each party will be as follows:

Israeli actions

- I2. Facilitate the evacuation without causing any damage to the properties or land.

Palestinian actions

- P2. A Palestinian commitment to fully collaborate with Israel during the relocation process and maintaining a restrained approach toward the actual relocation.

Principle 6 Palestinian full control of the borders of the Palestinian State and its outlets, and deployment of a temporary agreed upon multinational military monitoring system in the Jordan Valley (see Tables 23, 24 and 25).

Table 22 Israeli, Palestinian benefits and costs, perceived benefits and costs, and gain ratios for Principle 5

Concessions	Israelis' costs	Israelis' perception of Palestinians' benefits	Israelis' total loss	Palestinians' benefits	Palestinians' Perception of Israelis' costs	Palestinians' total gain
Israelis						
1	0.833389773	1	833,389.7731	1	1	1,000,000
2	0.880629868	0.908008481	799,619.3891	1	0.736808028	736,808.0285
3	1	0.818952863	818,952.8625	0.982178218	1	982,178.2178
Concessions	Palestinians' costs	Palestinians' perception of Israelis' benefits	Palestinians' total loss	Israelis' benefits	Israelis' perception of Palestinians' costs	Israelis' total gain
Palestinians						
1	1	0.833447332	833,447.3324	0.859366708	0.304401736	261,592.7177
2	0.625	0.857900137	536,187.5855	1	1	1,000,000
3	0.825	1	825,000	0.134795684	0.316676999	42,686.69265
Israeli ratios	P1	P2	P3	Trade-off		
I1	0	1.199918732	0		Action	Gain
I2	0	1.250594988	0	Israeli	I2	1.250595
I3	0	1.2210715	0	Palestinian	P2	1.374161
Palestinian ratios	P1	P2	P3			
I1	1.199835864	1.865018936	1.212121212			
I2	0	1.374160925	0			
I3	1.17845265	1.831780974	1.190519052			

Israeli perspective

Benefits

1. Economic gains from relinquishing control of the borders (typically realized in term of operational costs) (see Tables 23, 24 and 25).
2. International benefits.
 - a. Improved international relationship.
 - b. Removal of sanctions.
3. Removal of sanctions.
4. Tourism.
5. Trade.
6. Increased security cooperation.

Costs

1. Security threat.
 - a. Palestine itself.
 - b. Internal actors such as Hamas.
 - c. Non-state actors.
 - d. Third party actors.
2. Loss of control.
3. Movement.
4. Maintenance of borders.

5. Cooperation costs.
6. Political.

Palestinian actions

1. Palestinian control over customs.
2. Limited arms—Principle 8.
3. Multi-national oversight—Principle 9.
4. Access to airspace for training.
5. Maintain borders with other countries.

Palestinian perspective

Benefits

1. Economic gains internally and from controlling the borders: customs, relationships with neighboring countries.
2. International benefits: Open and establish international relationships and cooperation with the world.
3. Creating a new positive climate for better relations and cooperation between the two parties.
4. Free movement of people and goods.
5. Development of tourism industry.
6. Trade: controlling import and export on the basis of mutual benefits.
7. Political stability.
8. Encouraging international investment.

Costs

1. Running the border stations.
2. Manpower.
3. Political costs of engaging in early stages of the new situation with the Israelis.

Israeli actions

1. Total withdrawal from Palestinian territories.
2. Hand over fully the control point, border stations.
3. Provide Palestinians with all the information about the borders and passages.
4. Ensure no intervention what so ever in the border control points—respect the independence and integrity of the Palestinian borders.
5. Any information or requests passed through official channels on Palestinian side.

As a result of these matched concessions the actions to be required of each party will be as follows:

Israeli actions	Gain	Palestinian actions	Gain
I2. Hand over fully the control point, border stations	1.4851	P3. Multi-national oversight: Principle 9	1.5348
I1. Total withdrawal from Palestinian territories	1.2698	P2. Limited Arms: Principle 8	1.2103
I5. Any information or requests passed through official channels on Palestinian side		P4. Access to airspace for training	

Principle 7 Solve the Palestinian refugee problem in a just and agreed upon manner (see Tables 26, 27, 28 and 29).

Table 23 Israeli benefits, costs, perceived benefits and perceived costs for Principle 6

Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3	P4	P5
Economic gains from relinquishing control	0.1275	0.42	0.6	0.53	0.01	0.32
Improved international relationships	0.302	0.65	0.57	0.6	0.028	0.81
Removal of sanctions	0.0669	0.73	0.29	0.47	0.01	0.73
Tourism	0.1499	0.402	0.242	0.47	0.01	0.63
Trade	0.1591	0.55	0.01	0.112	0.01	0.27
Increased security cooperation	0.1946	0.55	0.98	0.87	0.47	0.55
		0.5535	0.4966	0.5378	0.105	0.5787
Israeli costs from Israeli concessions	Priorities	I1	I2	I3	I4	I5
Security threat	0.5116	0.84	0.5	0.222	0.6	0.082
Loss of control	0.3104	0.81	0.75	0.22	0.7	0.16
Maintenance of borders	0.0922	0.56	0.45	0.18	0.55	0.1
Cooperation costs	0.0858	0.58	0.86	0.71	0.58	0.53
		0.7826	0.6039	0.2594	0.6247	0.1463
Israeli perception of Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3	I4	I5
Economic gains internally and from controlling the borders: FDI, customs, relationships with neighboring countries	0.1667	0.65	0.4	0.19	0.5	0.24
International benefits: open and establish international relationships and cooperation with the World	0.1424	0.81	0.55	0.32	0.24	0.16
Creating a new positive climate for better relations and cooperation between the two parties	0.2328	1	0.73	0.65	0.89	0.9
Free movement of people and goods	0.2464	1	0.96	0.45	0.222	0.472
Development of tourism industry	0.0799	0.4	0.81	0.32	0.29	0.224
Political stability	0.1318	0.93	0.6	0.16	0.65	0.046
		0.8574	0.6953	0.3861	0.4883	0.4126
Israeli perception of Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3	P4	P5
Running the border stations	0.5547	0.55	0.55	0.84	0.082	0.89
Political Costs of engaging in early stages of the new situation with the Israelis	0.4453	0.272	0.7	0.45	0.84	0.29
		0.4262	0.6168	0.6663	0.4195	0.6228
Palestinian actions						
P1. Palestinian control over customs						
P2. Limited Arms: Principle 8						
P3. Multi-national oversight: Principle 9						
P4. Access to airspace for training						
P5. Maintain borders with other countries						

Israeli perspective

Benefits

1. Preservation of the Jewish and democratic nature of Israel.
2. Compensation for Jews from Arab lands/recognition as refugees (in accordance with Israeli law requiring this issue be raised in context of I-P negotiations).
3. Starting reconciliation process with the Palestinian people.
4. International recognition of the finality of the refugee problems.

Table 24 Palestinian benefits, costs, perceived benefits and perceived costs for Principle 6

Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3	I4	I5
Economic gains internally and from controlling the borders: customs, relationships with neighboring countries	0.3076	1	1	0.91	0.98	0.87
International benefits: Open and establish international relationships and cooperation with the world	0.0875	1	1	0.9	0.98	0.84
Creating a new positive climate for better relations and cooperation between the two parties	0.0403	0.94	0.98	0.9	0.98	0.86
Free movement of people and goods	0.2912	0.98	0.98	0.37	0.82	0.16
Development of tourism industry	0.0484	0.94	0.84	0.6	0.83	0.4
Trade: Controlling import and export on the basis of mutual benefits	0.0817	1	0.92	0.81	0.79	0.45
Political stability	0.119	1	0.93	0.71	0.91	0.84
Encouraging international investment	0.0243	0.95	0.88	0.76	0.78	0.66
		0.9876	0.9679	0.7009	0.8974	0.5945
Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3	P4	P5
Running the border stations	0.5516	0.87	0.84	0.7	0.95	0.81
Manpower	0.2858	0.76	0.66	0.65	0.95	0.76
Political costs of engaging in early stages of the new situation with the Israelis	0.1627	0.35	0.76	0.73	0.88	0.73
		0.754	0.7755	0.6906	0.9386	0.7827
Palestinian perceptions of Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3	P4	P5
Economic gains from relinquishing control	0.2237	1	0.9	0.25	0.75	0.25
Improved international relationships	0.1759	0.75	0.9	0.9	0.5	0.9
Removal of sanctions	0.0107	0	0	0	0	0
Movement	0.0241	0	0	0	0	0
Tourism	0.0542	0	0	0	0	0
Trade	0.1923	0.1	0.75	0.75	1	0.1
Cooperation	0.0167	0	0	0	0	0
Political	0.3025	0.1	0.9	0.9	1	0.1
		0.4051	0.776	0.6306	0.7505	0.2637
Palestinian perceptions of Israeli costs from Israeli concessions	Priorities	I1	I2	I3	I4	I5
Threat	0.0254	0	0	0	0	0
Loss of control	0.2777	0.25	0.5	0.5	0.25	0.25
Movement	0.0748	0	0	0	0	0
Maintenance of borders	0.4573	1	0.75	0.75	0.01	0.5
Cooperation costs	0.0397	0	0	0	0	0
Political	0.1251	0.01	0.1	0.1	0.25	0.1
		0.5279	0.4943	0.4943	0.1053	0.3106
Israeli actions						
I1. Total withdrawal from Palestinian territories						
I2. Hand over fully the control point, border stations						
I3. Provide Palestinians with all the information about the borders and passages						
I4. Ensure no intervention what so ever in the border control points: respect the independence and integrity of the Palestinian borders						
I5. Any information or requests passed through official channels on Palestinian side						

Table 25 Israeli, Palestinian benefits and costs, perceived benefits and costs, and Gain Ratios for Principle 6

Concessions	Israelis' costs	Israelis' perception of Palestinians' benefits	Israelis' total loss	Palestinians' benefits	Palestinians' perception of Israelis' costs	Palestinians' total gain
Israelis						
I1	1	1	1,000,000	1	1	1,000,000
I2	0.771658574	0.810940051	625,768.8436	0.980052653	0.936351582	917,673.8517
I3	0.331459238	0.450314906	149,261.0356	0.709700284	0.936351582	664,528.983
I4	0.798236647	0.56951248	454,605.7322	0.908667477	0.199469597	181,251.5349
I5	0.186940966	0.4812223	89,960.16162	0.601964358	0.588369009	354,177.173
Concessions	Palestinians' costs	Palestinians' perception of Israelis' benefits	Palestinians' total loss	Israelis' benefits	Israelis' perception of Palestinians' costs	Israelis' total gain
Palestinians						
PI	0.8033241	0.522036082	419,364.166	0.956454121	0.639651808	611,797.6084
P2	0.826230556	1	826,230.5561	0.858130292	0.92570914	794,379.0547
P3	0.735776689	0.812628866	597,913.3761	0.929324348	1	929,324.3477
P4	1	0.967139175	967,139.1753	0.181441161	0.629596278	114,234.6798
P5	0.833901556	0.339819588	283,376.0827	1	0.934714093	934,714.0928
Israeli ratios	PI	P2	P3	P4	P5	
I1	0	0	0	0	0	
I2	0	1.26944488	1.485092071	0	1.493705068	
I3	4.098843384	5.32207921	6.226168428	0	6.262277953	
I4	1.345776274	1.747402196	2.044242476	0	2.056098343	
I5	6.800761553	8.83034268	10.33039882	1.269836311	10.3903114	
Palestinian ratios	PI	P2	P3	P4	P5	
I1	2.384562347	1.210315925	1.672483072	1.033977348	3.528879327	
I2	2.188250514	1.110675277	1.534793982	0	3.238360284	
I3	1.584610792	0	1.111413475	0	2.34504259	
I4	0	0	0	0	0	
I5	0	0	0	0	1.249848504	
	Action	Gain				
Trade-off						
Israeli	I2	1.485092071				
Palestinian	P3	1.534793982				
Israeli	I5	1.269836311				
Palestinian	P4	0				
Israeli	I1	0				
Palestinian	P2	1.210315925				

Costs

1. Destroying the Jewish democratic nature of the State of Israel.
2. Destruction of towns and villages of Israel and resettlement of millions of Israelis.
3. Creating new imminent friction between Israelis and Palestinians.
4. Political.

5. To remain open to Palestinian claims.
6. Israel taking responsibility for the creation of the Palestinian refugee issue will leave Israel solely responsible for solving the refugee issue financially and morally.

Palestinian actions

1. Recognition of Israel as the nation state of the Jewish people.
2. Acknowledging the right of Palestinian refugees to return exclusively to the State of Palestine.
3. Resolution of the Palestinian refugee issue will settle all claims, collective and individual, of the Palestinian refugees.
4. The State of Israel has the exclusive right to decide who returns or immigrates to the State of Israel.
5. Claims for compensation of Palestinian refugees will be exclusively resolved by an agreed upon international mechanism with the participation and contribution of Israel.
6. Israel's contribution as defined by the agreement between the parties will be the total and final compensation to all claims.
7. Within 5 years of the establishment of the international mechanism, UNRWA will dissolve and refugee status will be formally annulled.
8. Palestinians will commit to a reconciliation process, conducted by a joint committee.
9. Jewish refugees shall be compensated.
10. This agreement provides for the permanent and complete resolution of the Palestinian refugee issue.

Palestinian perspective

Benefits

1. Israeli acknowledgement of its responsibility for the Palestinian refugee problem.
2. End of suffering of the Palestinian people.
3. End of conflict.
4. Protecting, maintaining and enhancing the Palestinian social fabric.
5. Returning Palestinian control over their destiny.
6. Enabling the Palestinian people to have its share of regional development projects.
7. Rehabilitating and integrating the refugees into the Palestinian society and elsewhere.
8. Peace and stability in the region.
9. Contributing to the welfare of the host countries.
10. Create a climate of mutual cooperation and normalization with Israel.

Costs

1. Failure to resolve the refugee problem.
2. Undermining any other option for resolving the refugee problem.
3. Palestinian refugees considered as immigrants to Israel and not as people who have the right of return.
4. Denial of the Palestinian right to participate in the decision making for resolving the refugee problem.

Table 26 Israeli benefits, costs, perceived benefits and perceived costs for Principle 7

Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Preservation of the Jewish and democratic nature of Israel	0.6723	0.788	1	1	1	0.113	0.575	0.538	0.525	0.363	0.975
Compensation for Jews from Arab lands/ recognition as refugees	0.0494	0.088	0.112	0.438	0.025	0.463	0.275	0.213	0.3	1	0.175
Starting reconciliation process with the Palestinian people	0.0853	0.625	0.313	0.763	0.538	0.663	0.563	0.862	1	0.862	0.862
International recognition of the finality of the refugee problems	0.1929	0.5	0.925	0.975	0.763	0.888	0.9	0.975	0.888	0.6	0.925
		0.6836	0.883	0.9471	0.8665	0.3263	0.6218	0.6336	0.6244	0.4825	0.9162
Israeli costs from Israeli concessions	Priorities	I1	I2	I3	I4	I5	I6				
Destroying the Jewish democratic nature of the State of Israel	0.3833	1	0.112	0	0.8	0.075	0.275				
Destruction of towns and villages of Israel and resettlement of millions of Israelis	0.3289	0.975	0.025	0.088	0.913	0.088	0.213				
Creating new imminent friction between Israelis and Palestinians	0.0631	0.975	0.075	0.188	0.538	0.112	0.313				
Political	0.037	0.925	0.112	0.112	0.925	0.15	0.088				
To remain open to Palestinian claims	0.1179	0.338	0.625	0.5	0.888	0.075	0.25				
Israel taking responsibility for the creation of the Palestinian refugee issue	0.0698	0.925	0.625	0.215	0.763	0.153	0.34				
		0.9041	0.1776	0.1187	0.8328	0.0897	0.2515				
Israeli perceived Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3	I4	I5	I6				
Israeli acknowledgement of its responsibility for the Palestinian refugee problem	0.1499	0.95	0.463	0.025	0.888	0.112	0.438				
End of suffering of the Palestinian people	0.2003	0.925	0.763	0.5	0.625	0.8	0.862				
End of conflict	0.066	0.9	0	0	0	0	0				
Protecting, maintaining and enhancing the Palestinian social fabric	0.0803	0	0.563	0.663	0.763	0.788	0.4				
Retaining Palestinian control over their destiny	0.1627	0.463	0.6	0.663	0.888	0.688	0.5				

Table 26 continued

Israeli perceived Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3	I4	I5	I6				
Enabling the Palestinian people to have its share of regional development projects	0.0476	0	0	0	0	0	0				
Rehabilitating and integrating the refugees into the Palestinian society and elsewhere	0.1439	0.275	0.9	0.7	0.8	0.9	0.788				
Peace and stability in the region	0.0446	0.663	0.663	0.825	0.7	0.825	0.663				
Contributing to the welfare of the host countries	0.0283	0	0	0	0	0	0				
Create a climate of mutual cooperation and normalization with Israel	0.0764	0.4	0.8	0.75	0.7	0.825	0.538				
		0.562	0.585	0.4597	0.6636	0.5815	0.5357				
Israeli Perceived Palestinian costs from Palestinian Concessions	Priorities	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Failure to resolve the refugee problem	0.287	0.8	0.425	0.15	0.862	0.625	0.625	0.725	0.25	0.313	0.763
Undermining any other option for resolving the refugee problem	0.1173	0.862	0.95	0.075	0.1	0.025	0.338	0.4	0.025	0.125	0.5
Palestinian refugees considered as immigrants to Israel and not as people who have the right of return	0.0315	0.825	0.725	0.1	0.088	0.05	0	0.088	0.05	0.025	0.338
Denial of the Palestinian right to participate in the decision making for resolving the refugee problem	0.1092	0.825	0.85	0.563	0.9	0.238	0.275	0.275	0.05	0	0.075
Dissolving UNRWA before the final resolution of the refugee problem and ending the status of the refugees as refugees	0.0634	0.195	0.09	0.1	0.37	0.375	0.115	0.225	0.255	0	0.05
Exacerbation of the suffering of the refugees as a result of dissolving UNRWA before the final settlement of the claims	0.0668	0.065	0.5	0.05	0.338	0.24	0.155	0.625	0.05	0	0.025
Potential for not implementing the agreement	0.3248	0.9	0.862	0.028	0.378	0.277	0.215	0.215	0.125	0.313	0.528
		0.7559	0.6683	0.1351	0.5289	0.3398	0.3365	0.4136	0.1418	0.2066	0.4725

Table 27 Palestinian benefits, costs, perceived benefits and perceived costs for Principle 7

Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3	I4	I5	I6				
Israeli acknowledgement of its responsibility for the Palestinian refugee problem	0.3099	0.663	0.438	0.338	0.75	0.725	0.925				
End of suffering of the Palestinian people	0.1067	0.725	0.788	0.725	0.9	0.862	0.862				
End of conflict	0.0396	0	0	0	0	0	0				
Protecting, maintaining and enhancing the Palestinian social fabric	0.0909	0.7	0.725	0.688	0.788	0.663	0.862				
Retaining Palestinian control over their destiny	0.2104	0.563	0.725	0.788	0.688	0.5	0.725				
Enabling the Palestinian people to have its share of regional development projects	0.0312	0	0	0	0	0	0				
Rehabilitating and integrating the refugees into the Palestinian society and elsewhere	0.1134	0.438	0.788	0.825	0.763	0.888	0.913				
Peace and stability in the region	0.0511	0.725	0.788	0.888	0.825	0.888	0.862				
Contributing to the welfare of the host countries	0.0133	0	0	0	0	0	0				
Create a climate of mutual cooperation and normalization with Israel	0.0336	0	0	0	0	0	0				
		0.5513	0.5675	0.549	0.6733	0.6281	0.7571				
Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Failure to resolve the refugee problem	0.0788	1	1	0	1	0	0.9	0.9	1	1	0
Undermining any other option for resolving the refugee problem	0.3502	0.9	1	0.9	1	0.75	0.9	1	0.9	0	0.9
Palestinian refugees considered as immigrants to Israel and not as people who have the right of return	0.1763	1	1	1	1	0.9	1	1	1	1	0.9
Denial of the Palestinian right to participate in the decision making for resolving the refugee problem	0.3072	1	0.9	0.9	1	0.9	0.75	1	0.9	1	0.9
Dissolving UNRWA before the final resolution of the refugee problem and ending the status of the refugees as refugees	0.0281	1	0.75	0.75	1	0.75	0.75	0.9	0.75	1	0.9
Exacerbation of the suffering of the refugees as a result of dissolving UNRWA before the final settlement of the claims	0.0449	1	1	0.9	1	0.75	0.9	0.9	0.9	1	0.75
Potential for not implementing the agreement	0.0144	1	1	0.9	1	0.9	0.9	1	0.9	1	0.9
		0.965	0.9623	0.843	1	0.7656	0.8673	1	0.92	1	0.82
Palestinian perceived Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Preservation of the Jewish and democratic nature of Israel	0.6802	0.1	1	0.75	0.9	0.9	0.9	1	0.9	0	1
Compensation for Jews from Arab lands/recognition as refugee	0.0322	0	0.25	0.25	0.1	0.1	0.1	0	0.9	0	0
Starting reconciliation process with the Palestinian people	0.0925	0.25	0.5	0.5	0.5	0.75	0.75	0.1	0.5	0	0.75

Table 27 continued

Palestinian perceived Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
International recognition of the finality of the refugee problem	0.1951	0.25	0.25	0.75	0.75	0.9	0.9	0.5	0.9	0	0.75
		0.1399	0.7832	0.711	0.808	0.8603	0.8603	0.8	0.86	0	0.9
Palestinian perceived Israeli costs from Israeli concessions	Priorities	I1	I2	I3	I4	I5	I6				
Destroying the Jewish character of the State of Israel	0.3498	0.75	0.25	0	0	0	0				
Destruction of towns and villages of Israel and resettlement of millions of Israelis	0.0324	0.75	0	0	0	0	0				
Creating new imminent friction between Israelis and Palestinians	0.0446	0.75	0.1	0	0.1	0	0				
Political	0.1433	0.9	0.1	0.1	0.5	0.25	0.75				
To remain open to Palestinian claims	0.2069	0.9	0.5	0	0.25	0.75	0.1				
Israel taking responsibility for the creation of the Palestinian refugee issue	0.2229	0.9	0	0.5	0.75	0.25	0.1				
		0.836	0.2097	0.126	0.295	0.2467	0.1505				

5. Dissolving UNRWA before the final resolution of the refugee problem and ending the status of the refugees as refugees.
6. Exacerbation of the suffering of the refugees as a result of dissolving UNRWA before the final settlement of the claims.
7. Potential for not implementing the agreement.

Israeli actions

1. Right to choose to return to their original home.
2. Right to choose to resettle in the State of Palestine, the host countries or third countries.
3. Endorsement of the international community.
4. Endorsement of the Palestinian refugees comprehensive and individual justice.
5. International commission to develop opportunities for the refugees.
6. International commission to adjudicate property claims.

Table 28 Israeli, Palestinian benefits and costs, perceived benefits and costs for Principle 7

Concessions	Israelis' costs	Israelis' perception of Palestinians' benefits	Israelis' total loss	Palestinians' benefits	Palestinians' perception of Israelis' costs	Palestinians' total gain
Israelis						
I1	1	0.84689572	846,895.7203	0.728173293	1	728,173.2928
I2	0.196438447	0.881555154	173,171.3254	0.74957073	0.250837321	188,020.3136
I3	0.131290786	0.692736588	90,949.93146	0.725135385	0.150478469	109,117.2625
I4	0.921137042	1	921,137.0424	0.889314489	0.352870813	313,813.1273
I5	0.099214689	0.876280892	86,939.93587	0.829612997	0.295095694	244,815.2229
I6	0.278177193	0.807263412	224,562.2697	1	0.180023923	180,023.9234
Concessions	Palestinians' costs	Palestinians' perception of Israelis' benefits	Palestinians' total loss	Israelis' benefits	Israelis' perception of Palestinians' costs	Israelis' total gain
Palestinians						
P1	0.965	0.156155821	150,690.3672	0.721782283	1	721,782.2828
P2	0.9623	0.87420471	841,247.1928	0.932319713	0.884111655	824,274.7243
P3	0.8425	0.79339212	668,432.8608	1	0.178727345	178,727.3449
P4	1	0.901886371	901,886.3712	0.91489811	0.699695727	640,150.2982
P5	0.7656	0.960263422	735,177.6761	0.344525393	0.449530361	154,874.6245
P6	0.8673	0.960263422	832,836.4661	0.656530461	0.445164704	292,264.1887
P7	0.9848	0.878446255	865,093.8721	0.668989547	0.547162323	366,045.8747
P8	0.9213	0.963277151	887,467.2396	0.659275684	0.187590951	123,674.1526
P9	0.6498	0.130371693	84715.52629	0.5094499	0.273316576	139,241.1024
P10	0.8223	1	822300	0.967374089	0.625082683	604,688.7911

Matched concessions

Israeli actions	Gain	Palestinian actions	Gain
I1. Right to choose to return to their original home	0	P9. Jewish refugees shall be compensated	8.595
I3. Endorsement of the international community	1.965	P3. Resolution of the Palestinian refugee issue will settle all claims, collective and individual, of the Palestinian refugees	0
I5. International commission to develop opportunities for the refugees	8.302	P1. Recognition of Israel as the Nation State of the Jewish people	1.625
Total	10.27		10.22

Principles to solve the Palestinian refugee problem

- The Palestinian refugees can choose to resettle in the State of Palestine, other host countries, or third party countries; those Palestinians who were originally displaced according to UNRWA's registry from the area inside the Green Line and their spouse will be permitted to return to the State of Israel within 5 years. Palestin-

Table 29 Israeli, Palestinian gain ratios for Principle 7

Israelis' ratios	Palestinian's Concessions										
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Israelis' concessions											
I1	0	0	0	0	0	0	0	0	0	0	
I2	4.168024	4.75988	1.032084	3.69663	0	1.687717	2.113779	0	0	3.491853	
I3	7.93604	9.06295	1.965118	7.038491	1.702856	3.213462	4.024697	1.359805	1.530964	6.64859	
I4	0	0	0	0	0	0	0	0	0	0	
I5	8.30208	9.480968	2.055757	7.363133	1.781398	3.361679	4.210331	1.422524	1.601578	6.955248	
I6	3.214174	3.670584	0	2.850658	0	1.301484	1.630042	0	0	2.692744	
Palestinian's ratios	Palestinian's concessions										
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Israelis' concessions											
I1		4.832248	0	1.089374	0	0	0	0	0	8.595512	0
I2		1.247726	0	0	0	0	0	0	0	2.219432	0
I3		0	0	0	0	0	0	0	0	1.288043	0
I4		2.082503	0	0	0	0	0	0	0	3.704317	0
I5		1.624624	0	0	0	0	0	0	0	2.889851	0
I6		1.194661	0	0	0	0	0	0	0	2.12504	0
Trade-off	Action	Gain	Total								
Israeli	I1	0	10.2672								
Palestinian	P9	8.595512	10.22014								
Israeli	I3	1.965118									
Palestinian	P3	0									
Israeli	I5	8.30208									
Palestinian	P1	1.624624									

ian refugees will be eligible for citizenship of the state they choose to resettle in or return to.

- All refugees have the right to compensation for their suffering and loss of property. An agreed upon international commission will handle all claims and implementation.

While the participants spent considerable time in developing the principles noted above to solve the Palestinian refugee problem, it became clear that these principles were actually guidelines to approach that problem and did not represent a totally implementable program. Still ahead will be a series of meetings to address the following issues which, when resolved, would hopefully yield the details of a workable program. These issues would be addressed in the following order:

1. How can we satisfy the Palestinian narrative about the importance of the right of return? We have already completed some aspects of this question in our last meeting.
2. How do we get information from the refugees themselves about what their needs and preferences are? And how do we get in touch with refugees in camps and who would they have confidence in talking to?

3. How and where to resettle the refugees currently in camps and how can they be appropriately housed and given employment opportunities?
4. How can we compensate Palestinian refugees for the losses they have incurred, including who will be compensated, how much will they receive and where will the resources come from?

When this work is completed, the parties will have in hand a proposal for an approach, which is fair to both sides.

Principle 8 Limited Arms of the Palestinian state and international guarantees from the international community against aggression from other parties (see Tables 30, 31 and 32).

Table 30 Israeli benefits, costs, perceived benefits and perceived costs for Principle 8

Israeli benefits from Palestinian concessions	Priorities	P1	P2	P3
Reduction in threat from conventional military risk from Palestinians	0.3278	1	0.975	0.862
No other country can support/aid Palestinians with military	0.1883	0.563	0.525	1
Sense of security	0.1726	0.975	1	0.862
Using Palestinian airspace for military training	0.3113	0.938	0.033	0.07
		0.8939	0.6012	0.6417
Israeli costs from Israeli concessions	Priorities	I1	I2	I3
Threat	0.4448	1	0.01	0.725
Loss of control	0.4757	0.888	0.375	0.825
Redeployment and restructuring how to 'deal' with the new status	0.0795	0.813	0	0
		0.9316	0.1828	0.715
Israeli perception of Palestinian benefits from Israeli concessions	Priorities	I1	I2	I3
Allocation of resources for economic development rather than military expenditures	0.5978	0.195	0.01	0.663
Declare and ensure the neutrality of the State of Palestine	0.1127	0.725	0.925	0.888
Ensure the security of the State of Palestine through international guarantees	0.2895	0.318	0.725	0.862
		0.2902	0.3201	0.7458
Israeli perception of Palestinian costs from Palestinian concessions	Priorities	P1	P2	P3
Risk associated with limited national defense	0.11	0.725	0.563	0.1
Political cost associated with the limitations of arms	0.2364	0.725	0.5	0.5
Financial burden incurred by the international community and to be shared by the State of Palestine	0.1688	0.033	0.502	0.313
National pride undermined by limited arms policy	0.4849	0.75	0.1	0.725
		0.6203	0.3133	0.5335
Palestinian actions				
P1. List of forbidden weapons				
(a) Strategic Weapons				
(b) Tanks				
(c) Missiles/Rocket				
(d) Aircraft				
P2. Monitoring				
(a) Private groups				
P3. Multinational monitoring (Principle 9)				

Table 31 Palestinian benefits, costs, perceived benefits and perceived costs for Principle 8

Palestinian benefits from Israeli concessions		Priorities	I1	I2	I3
Allocation of resources for economic development rather than military expenditures	0.2176	0.9	0.9	0.9	0.9
Declare and ensure the neutrality of the State of Palestine	0.0503	1	1	0.9	0.9
Ensure the security of the State of Palestine through international guarantees	0.7322	1	1	0.9	0.9
		0.9782	0.9782	0.9	0.9
Palestinian costs from Palestinian concessions		Priorities	P1	P2	P3
Risk associated with limited national defense	0.6668	0.9	0.5	0.5	0.5
Political cost associated with the limitations of arms	0.2181	0.75	0.75	0.75	0.75
Financial burden incurred by the international community and to be shared by the State of Palestine	0.0376	0.25	0.25	0.25	0.25
National pride undermined by limited arms policy	0.0775	0.75	0.75	0.75	0.75
		0.8312	0.5645	0.5645	0.5645
Palestinian perception of Israeli benefits from Palestinian concessions		Priorities	P1	P2	P3
Reduction in threat from conventional military risk from Palestinians	0.2389	0.75	0.75	0.9	0.9
No other country can support/aid Palestinians with military	0.0478	0	0	0	0
Social psyche: without the threat of military presence the social psyche will be relieved	0.1082	1	0.75	0.9	0.9
Using Palestinian airspace for military training	0.0222	0	0	0	0
Allows for finalization of the conflict	0.5828	0.9	0.75	0.9	0.9
		0.8119	0.6975	0.837	0.837
Palestinian perception of Israeli costs from Israeli concessions		Priorities	I1	I2	I3
Threat	0.0377	0.25	0.01	0.01	0.01
Loss of control	0.0998	0.01	0.01	0.01	0.01
Restructuring how to 'deal' with the new status	0.5986	0.1	0.01	0.1	0.1
Political	0.2639	0.5	0.5	0.25	0.25
		0.2023	0.1393	0.1272	0.1272
Israeli actions					
1. Israeli commitment not to violate the Palestinian sovereignty by invading air space					
2. Israel should abide by the international commitment to support principle 8					
3. Israeli commitment not to violate the Palestinian sovereignty by invading borders					

Israeli perspective

Benefits

1. Reduction in threat from conventional military risk from Palestinians.
2. No other country can support/aid Palestinians with military assistance.
3. Social psyche: without the threat of military presence the social psyche will be relieved (sense of security).
4. Using Palestinian airspace for military training.
5. Allows for finalization of the conflict.

Costs

1. Lack of control.
2. Threat.
3. Political.
4. Restructuring of how to 'deal' with the new status.

Table 32 Israeli, Palestinian benefits and costs, perceived benefits and costs, and gain ratios for Principle 8

Concessions	Israelis' costs	Israelis' perception of Palestinians' benefits	Israelis' total loss	Palestinians' benefits	Palestinians' perception of Israelis costs	Palestinians' total gain
Israelis						
1	1	0.389112363	389,112.3626	1	1	1,000,000
2	0.196221554	0.42920354	84,218.9857	1	0.688581315	688,581.3149
3	0.76749678	1	767,496.7797	0.920057248	0.628769155	578,503.6181
Concessions	Palestinians' costs	Palestinians' perception of Israelis' benefits	Palestinians' total loss	Israelis' benefits	Israelis' perception of Palestinians' costs	Israelis' total gain
Palestinians						
1	1	0.970011947	970,011.9474	1	1	1,000,000
2	0.679138595	0.833333333	565,948.829	0.672558452	0.505078188	339,694.6041
3	0.679138595	1	679,138.5948	0.717865533	0.860067709	617,412.9645
Israeli ratios	P1	P2	P3			
I1	2.569951757	0	1.586721533			
I2	11.87380721	4.033468241	7.331042512			
I3	1.302937063	0	0			
Palestinian ratios	P1	P2	P3			
P1	1.030915137	1.766944198	1.472453499			
P2	0	1.216684759	1.013903966			
P3	0	1.022183612	0			
Trade-off	Action	Gain				
Israeli	I1	1.586721533				
Palestinian	P3	1.472453499				

Palestinian actions

1. List of forbidden weapons.
 - a. Strategic weapons.
 - b. Tanks.
 - c. Missiles/rocket.
 - d. Aircraft.
2. Monitoring by private groups.
3. Multinational monitoring (Principle 9).

Palestinian perspective

Benefits

1. Allocation of resources for economic development rather than military expenditures.
2. Declare and ensure the neutrality of the State of Palestine.
3. Ensure the security of the State of Palestine through international guarantees.

Costs

1. Threat.
2. Loss of control.
3. Redeployment and restructuring how to 'deal' with the new status.

Israeli actions

1. Israeli commitment not to violate the Palestinian sovereignty by invading air space.
2. Israel should abide by the international commitment to support principle 8.
3. Israeli commitment not to violate the Palestinian sovereignty by invading borders.

As a result of these matched concessions the actions to be required of each party will be as follows:

Israeli actions

- Israeli commitment not to violate the borders of the State of Palestine.

Palestinian actions

- Multi-national oversight—Principle 9.

Principle 9 Agreed upon international monitoring mechanism and agreed upon binding international arbitration mechanisms.

What is needed for the implementation of this principle is:

- *Monitor and verify* the implementation of the agreement.
- *Time table for the implementation* of the agreement.
- *International arbitration mechanism* to deal with any problems arising during implementation of agreements based on differences in interpretations.

Conclusions and recommendations

The outcomes noted previously represent a first step at producing a solution to the controversy, which can be used as a basis for further negotiation. With the exception of the refugee problem, it postulates what could be considered as a first draft for a proposal that would end hostilities. AHP has provided a solution which has drained much of the emotionality as it is possible in such circumstances. It has structured the problem much more efficiently than traditional face to face negotiations have been able to provide. At the same time, it has utilized a more refined measurement technique that makes it possible to compare the benefits and costs which each side sees as the result of the judgments they have made. When the total implementation of the refugee issue is completed, which may take another year, we will have produced, through AHP, an implementable proposal to begin a new era in the Middle East.

Over the last six decades, a veritable plethora of negotiators, presidents, foreign ministers, organizations like the United Nations, groups of allied countries, etc. have attempted to create peace in Israel and Palestine. However, no matter how worthy their intentions were, they have all failed. The basic premise of these negotiations has been that the way to a solution required an outside party to convince the principals to gather in the same room and begin negotiating. The outside parties then left the negotiators to attack one or more of the issues, together or separately, and find an acceptable outcome. While some progress was made using this approach, it was never an outcome which came even close to providing the necessary solution.

So what is it we have produced that will move the process ahead to a point beyond what had been achieved to date? The AHP solution will eventually provide a proposal, with many of the details in place. It will suggest exactly where the borders should be for each country. It will drive away most of the emotionality from the discussions. It will identify which settlements will remain in Israeli possession and which will need, to either be closed or the communities remain in place, but under Palestinian sovereignty. It will suggest exactly how much land now owned by the Palestinians, but in the future will be occupied by the Israelis, needs to be counterbalanced by giving Israeli land to the Palestinians. It will evaluate the land offered for such land swaps in a mode that will be satisfactory to the Palestinian side. It will identify East Jerusalem as the capital of the Palestinian State, but will maintain the status quo of the holy places in Jerusalem.

It will permit the Palestinians to acknowledge the existence of Israel as a Jewish State while guaranteeing the rights of its minority citizens. It will guarantee that Israel will respect the integrity of the West Bank and Gaza by allowing free and safe passage between the two areas. It will guarantee the evacuation of Israeli settlers from the Palestinian territories that are not included in the land swaps. It will guarantee that the Palestinians will be in full control of the Palestinian State border and its outlets. It will permit the deployment of a temporary agreed upon multinational military monitoring system in the Jordan Valley. It will limit the arms permitted to the Palestinian state and provide international guarantees against aggression from other parties. It will identify the process by which both communities will have access to the holy places.

Eventually it will outline a specific outcome whereby some Palestinian refugees have the option to return to live in Israel if they wish. It will also address the question of what compensation should be paid to which refugees and how they might be resettled in other countries or territories. This portion of the work remains to be completed.

One may ask whether this constitutes a complete solution to the problem at hand. The answer is an obvious no. Many details remain to be settled. Some disagreement among the official negotiators will inevitably require modification of parts of the outcomes noted above. There also is the question of whether a different set of participants expressing different judgments may reach different conclusions. While that may be true, the credibility of the current participants suggests that the outcomes might be quite similar. But even if that is not the case, we will produce, through AHP, an outcome that provides an implementable alternative solution. No matter how the outcomes are produced, what the actual negotiators will have in hand is an implementable or partially implementable proposal that has been provided by knowledgeable people on both sides and supported by a far more scientific approach, using quantitative and computer technology, than has ever been attempted before. It is far more likely that a group of negotiators reviewing a detailed, specific and implementable solution will be able to modify it towards a final agreement than if they were starting from scratch in trying to develop a solution without structural foundation and judgments which are unique to AHP. After 60 years of trying the parties might be well advised to think outside of the box and look at the picture with a different focus.

One may skeptically argue that even with such a cool-headed rational agreement between the two sides, negatives have so dominated the scene, since the beginning, that what one has done on paper will encounter such resistance that people would give up

and the conflict would continue. Whatever solution is provided, it will inevitably require a vote by the populations of both sides. Even if the Gaza population would vote negative, on the recommendation of its Hamas constituency, the proposal might be approved by an overriding positive vote of its West Bank constituency. Similarly, certain groups within the Israeli side will likely vote negative. However, using democratic principles, the majority should prevail, even if the vote is close. Just how strong the residents of Israel and Palestine feel about the advantages of peace versus the current conflict will be recorded in the vote. If the vote is close, one or both sides will have an implementation problem that would certainly be difficult. If the popular vote is positive on one side and negative on the other, the negotiators will have to go back to work. But, at least, the populations will have had a chance to express their democratic position. Getting to that stage of the negotiations would be a step forward that might suggest sufficient momentum to adjust the proposal enough to engender majority support.

Thinking outside of the box is always painful and breeds uncertainty. An AHP-derived solution will certainly be a novel way of ending the controversy, but when all else has failed, summoning the courage to consider unique approaches may be what is called for in these dire circumstances.

Authors' contributions

TLS, LGV and HJZ contributed equally to this work. All authors read and approved the final manuscript.

Compliance with ethical guidelines**Competing interests**

The authors declare that they have no competing interests.

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