

# Using Visualization Techniques to Evaluate the Performance of the South African Film Industry at a Project Level

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This study sets out very preliminary work-in-progress and the authors would be grateful of comments but also to not be quoted without their permission.

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## Abstract

In 2004 the South African Department of Trade and Industry (DTI) introduced a Film and Television Production Rebate Programme, principally to attract large-budget foreign productions to South Africa. In 2008, the programme was changed to include support for local film and television productions, as well as co-productions involving both South African and foreign partners. In 2011/12, rebates for post-production activities were also included. In order to qualify for the rebate, certain criteria have to be met including success in job creation and skills development within the industry, alongside a particular focus on the percentage of “historically disadvantaged individuals” (HDIs) employed. This study sets out the issues associated with evaluating success in meeting these various criteria and is the first study to apply multi-criteria visualization techniques to inform the evaluation of project performance in the film sector and in cultural economics more generally. Specifically, the ‘PROMETHEE’ method is applied, which requires only a few parameters and is easy to explain and use. The evaluation of each performance criterion can be expressed in natural units and therefore scaling effects are eliminated. It also has the advantage that normalization of scores is not required, which avoids the situation where ranking depends on a selected normalization

method. Analysis is simply premised on a need to define a preference function that is characterized only by an ‘indifference’ and ‘preference’ threshold. Apart from presenting project performance in a visually intuitive manner, the approach helps to clarify patterns of relative success, and to identify project exemplars for more efficiently guiding future public support in the sector. The method is argued to be readily applicable to the evaluation of cultural policies and projects in other sectors and geographical contexts.

## **1. Introduction**

Establishing the worth of public financial support for various sectors of the arts has proved a source of contention and debate among arts professionals, government and economists. Charges of a lack of appreciation of cultural values and empirical reductionism are often leveled against economists and shared ground is sometimes difficult to find because of differing perspectives and modes of analysis. A broadly accessible means of presenting the issues to all parties in an intuitive way would seem to be warranted and this task forms the focus of the study presented herein. Various issues and literature on film subsidy effectiveness have recently been outlined and explored in the context of three very different national film (and in one case television) industries. These are set out in MacKenzie and Walls (2013) for Australia; Teti, Collins and Sedgwick (2014) for Italy and Collins and Snowball (2014) for South Africa. Evaluating the effectiveness of subsidy is also rendered more problematic when there is (i) a desire for such subsidies to achieve multiple and possibly conflicting policy objectives and (ii) there are two or more governmental agencies favoring different objectives (e.g. economic development, employment enhancement, cultural prestige building). These features beset consideration of many national film industries.

This particular study does not rehearse again the well-trodden arguments regarding the general merits and demerits of public financial support for the arts which are outlined in the film subsidy studies previously cited. Rather it focuses and simply operates on a very fundamental, mundane level to illustrate a specific practical means, previously used in many other corporate and scientific settings [See, for many examples, the survey of Behzadian *et al* (2010)]. The approach serves to frame discussions on the effectiveness of public subsidy in a specific national film and television industry. The paper is organized as follows. The next section sets out the policy and country context where the case study film and television industry resides – South Africa. The data and research method are then set out. Results are then presented and discussed with concluding remarks offered in the final section.

## **2. The South African Film Industry**

Despite nearly 20 years of democracy, South Africa remains a country divided largely along racial lines, with one of the highest Gini coefficients in the world (United Nations Human Development Report, 2009). This is also reflected in the film and television industry, particularly in terms of the content of South African productions (Botha 2003). Early exposure to high technology, US productions has given South African audiences a taste for technically sophisticated international films and television productions, with which many local producers find it difficult to compete (Creative Industries Report 2008). Unlike the Nigerian film industry (“Nollywood”), South African films made by South Africans, about South Africans, have seldom managed even to cover their costs (Barnard and Tuomi, 2008; NFVF 2008; NFVF 2011).

Nevertheless, the South African film and television industry, centred mostly on the cities of Cape Town and Johannesburg, has grown significantly in the past 20 years (Creative Industries Report 2008; NFVF, 2013). Existing skills and knowledge, advanced technical

capacity, a great variety of locations, and competitive prices have all encouraged the production of foreign film and television series (Tuomi, 2007). Not only can such projects provide valuable foreign exchange inflow, but they are also an opportunity for skills transfer, further developing the capacity and competitiveness of South African labour in the industry.

A dichotomy thus exists: on the one hand, the film and television industry has been very successful in building technical capacity and attracting large budget international productions; but on the other, local productions are struggling to source financing and attract audiences. There have been some notable exceptions, such as “*Tsotsi*”, and “*Otello Burning*”, which were box office successes both in South Africa and internationally, but these have tended to be in the minority. The Creative Industries Report (2007:19) said of the South African film sector: “With more than 90% of all film releases in South Africa consisting of imported material there is no doubt that local talent and local content remains a priority”. They attribute the lack of local content to poor distribution and marketing channels, both locally and internationally, but also to the small size of the domestic market, and lack of audience development programmes. Flanery (2009) also points out that the lack of exhibition venues in black townships mean that even films intended primarily for black audiences often fail to reach them.

Like all cultural industries, film and television can provide both market and non-market benefits (Towse, 2011). Market benefits, such as job creation, foreign exchange inflow, investment, increases in GDP and so on, are more easily measurable, and thus tend to be the focus of creative industry reports and strategies. However, non-market benefits, such as fostering social cohesion, an appreciation of other points of view, an examination of identity, and being the source of a sense of pride, can be equally important (Creative Industries Report 2007, Townley et al., 2009), especially in a country like South Africa, still struggling to come

to terms its apartheid past. In this sense, the film and television sector can be said to provide a public good that should be supported by the government.

Recognising both the potential market and non-market benefits, many countries have supported their film and television industry in some way, most usually through a subsidy or tax rebate scheme (Creative Industries Report 2007, Kettering 2012). Film and television production in apartheid South Africa maintained technical expertise, but produced content for a largely white audience and was heavily controlled and censored by the state (NFVF, 2000). The post-1994 government recognised the urgent need to diversify both the content and the skills base in the industry, as well as to encourage and maintain the competitiveness of foreign film production.

The first goal was addressed through the establishment of the National Film and Video Foundation (NFVF) in 1997, under the Department of Arts Culture Science and Technology. The primary mandate of the NFVF was to create an environment in which the South African film and video industry could develop, and to promote South African films locally and internationally (Botha 2003). The objectives of the NFVF are listed as: “To increase the number of SA films and PDIs [Previously Disadvantaged Individuals] producing them; To increase audience access to SA films; To increase number of people trained in the industry, particularly in areas of shortage of skills; and to promote Social Cohesion and promote opportunities to express the nation’s stories through film” (NFVF website 2013).

In 2004 the South African Department of Trade and Industry (DTI) introduced the Film and Television Production Rebate Programme the main aim being to attract large-budget foreign productions to South Africa. In 2008, the programme was changed to include support for local film and television productions, as well as co-productions involving both South African and foreign partners (DTI 2008a; 2008b). In 2011/12, rebates for post-production activities were also included (DTI 2011; 2012).

In order to qualify for the rebate, certain criteria have to be met by all three categories (that is, South African productions; Co-productions; and Foreign productions). For South African productions and Co-productions, South Africans must be the majority share-holders in the legal entity (Special Purpose Vehicle) established for the project, and at least one South African must play an active role in the production. There is a minimum spending requirement of R2.5 million, on which a rebate of 35% can be claimed for the first R6 million, and 25% thereafter.

For foreign projects, there is a minimum spending requirement of R12 million, with at least 50% of principal photography to take place in South Africa, and a minimum of 4 weeks of filming. Including the post-production incentive, such projects can claim between 22.5% and 25% of Qualifying South African Production Expenditure (QSAPE).

All projects must comply with Broad-Based Black Economic Empowerment (B-BBEE) employment practices, which focus on addressing past imbalances by transforming the ownership and skills profiles of South African firms to more closely represent the demographics of the country (B-BBEE Act 2003). Compliance with certain quotas for the employment of black South Africans, and reporting according to the B-BBEE scorecard (Codes of Good Practice on B-BBEE 2007) are required in order for any project to be eligible for the DTI rebate scheme.

An (August 2012) industry report to the DTI on the impact of the incentive schemes (including input from the Independent Producers Organization, the Documentary Filmmakers Association, and the South African Screen Federation), emphasised the job creation and skills development of the industry, with a particular focus on the percentage of “historically disadvantaged individuals” (HDIs) employed. However, a recommendation of the report was that changes to the co-production rebate put forward by the NFVF (which would require

more South African ownership and direct participation to qualify) should be carefully considered:

“We fear that the current proposed changes are in contravention of international treaties and would result in massive job losses and decimation of the South African co-production sector worth R1.285 billion over the last four years” (Industry Report, 2012:11).

This is a clear demonstration that, while there is significant potential overlap between goals of the NFVF and the DTI, there are also tensions, particularly in a country with a 25% unemployment rate, where economic growth and job creation are of paramount importance (Quarterly Labour Force Survey, 2013).

There is some evidence, however, that the South African film and television industry has become more, rather than less, concentrated. The report commissioned in 2000 by the NFVF identified a trend of “increasing consolidation” in the industry. While this enabled some firms to gain from economies of scale and to become increasingly successful in bidding for large, international productions, it was perhaps an indicator that diversification (of ownership and content) was an unlikely outcome. This is also likely to be reflected in terms of subsidy concentration. Collins and Snowball (2014) showed that, between 2009 and 2011, nearly three-quarters (73%) of DTI rebates were paid to just ten firms.

They also found that subsidised film and television projects (between 2009 and 2011) contributed an average of R2.2 billion to South Africa’s GDP. They calculated that subsidised projects created approximately 5 700 full time equivalent (FTE) direct, and a further 10 000 FTE indirect, jobs per year. A study of the whole South African film and television industry in 2012 (NFVF 2013) found that it contributed R3.5 billion to GDP and created just over 25 000 FTE jobs. Both studies conclude that the return on the subsidy is thus

good (in term of both GDP and tax revenues generated) and that there clear evidence that the film and television industry is an important component of the economy, even taking into account only the market benefits.

### **3. Data**

Subsidy claim data was provided by the South African Department of Trade and Industry (DTI) for the period 2009 to June 2012. Analysis was sanctioned only on completed projects and where no identification of individual project costs was permitted, as this might afford contemporary commercial intelligence to competing firms. The data set contained information on the date of application approval, the Qualifying South African Production Expenditure (QSAPE), and employment in various categories, divided into white and black people. QSAPE refers to production expenditure by the applicant on goods, facilities and services provided by South African companies, which could also include copyrights. Non-qualifying expenditures include items such as financing expenditure, general business overheads and physical capital (such as land and buildings, depreciation and the cost of services embodied in goods).

The raw project employment data did not reflect typical film/TV project durations and the problem of multiple counting of full-time jobs was evident in the data. Accordingly, the employment data was weighted to convert project jobs in various employment categories (producers, “creatives”, crew, cast and extras) to annual Full-Time Equivalent (FTE) jobs. The values of these weights were informed by project approval and claim dates, internal industry sourced publications and a number of elite interviews with senior executives from film production companies and the Western Cape Film Board.

Analysis is made of three full years of 2009-2011 of authorized incentive claims for 106 film and television projects over this period. However, only 69 of the 106 film projects were



completed at the time of the analysis. The financial data was deflated using the South African Consumer Price Index (2008 = 100).

#### **4. The Mode of Analysis - Preference Ranking Organization METHod for the Enrichment of Evaluations (PROMETHEE)**

The analytical technique deployed is PROMETHEE (Brans and Vincke 1985, Brans 1982) - a multicriteria method that requires only a few parameters and is easy to use and explain via non-technical user-friendly visualization software that is readily available (Ishizaka and Nemery, 2013). The evaluation of each criterion can be expressed in their own units and therefore problems relating to scaling effects are completely eliminated. It has thus the advantage that a normalization of the scores is not required, which avoids the drawback that the ranking critically hinges on the selected normalization method (Ishizaka and Nemery 2011, Tofallis 2008). The decision-maker needs to define a preference function that is generally characterized only by an indifference and preference threshold.

**Information within a Criterion-** As with any multicriteria decision problem, we consider a set of  $m$  possible actions or alternatives  $A = \{a_1, a_2, \dots, a_m\}$  which are evaluated on a set of  $n$  criteria  $C = \{c_1, c_2, \dots, c_n\}$ . For each criterion, and for each ordered pair of actions, the decision maker expresses his preference by means of a preference degree. The preference degree  $P_i(a,b)$  indicates if an alternative  $a$  is preferred or not to alternative  $b$  on the criterion  $c_i$ . The preference degree is obtained using the preference function. Several typical shapes are proposed (Brans and Vincke 1985) for the preference functions like the linear, the step or Gaussian preference function.

**Aggregated Preference Functions-** In order to evaluate how much action  $a$  is preferred to  $b$  over all the criteria, the preference index  $\pi(a,b)$  is calculated with a weighted sum (1) of the

preference degrees  $P_i(a,b)$ . The weights  $w_i$ , calculated represent the importance of each criteria in the decision.

$$(1) \quad \pi(a,b) = \sum_{i=1}^n P_i(a,b) \cdot w_i$$

where  $P_i(a,b)$  is the score of the preference function,  $w_i$  the weight of criterion  $c_i$  and  $n$  the number of criteria.

**Outranking Flows-** As each action is compared with  $m-1$  other actions, two flows can be defined with (1):

The Positive flow:

$$(2) \quad \Phi^+(a) = \frac{1}{m-1} \sum_{x \in A} \pi(a,x)$$

...with  $m$  being the number of actions of the set  $A$

This score represents the global strength of action  $a$  in comparison to all the other actions. It is this score that has to be maximized.

The Negative flow:

$$(3) \quad \Phi^-(a) = \frac{1}{m-1} \sum_{x \in A} \pi(x,a)$$

...with  $m$  being the number of actions of the set  $A$

This score represents the global weakness of  $a$  in comparison to all the other actions. It is this score that has to be minimized.

**Ranking-** The complete ranking of PROMETHEE II is given by the net flow:

$$(4) \quad \Phi(a) = \Phi^+(a) - \Phi^-(a)$$

The higher the net flows, the better the rank of an action. A fuller discussion on net flow scores can be found in Brans and Mareschal (2005) and Mareschal *et al.* (2008).

The upshot is that a score is produced that is entirely relative to the pool of other projects. The score is relative and sums to 0. This means that if we have say only two films and one has a score of 0.5, then the second film will have a score of -0.5.

#### **4.1 Visualizing the Results - Graphical Analysis for Interactive Aid (GAIA)**

The aim of the GAIA method is to represent on a two dimensional view as much as possible the decision-maker's preferences and its implications (Brans and Mareschal 1994). For this purpose, a plane in the hyperspace is found via principal component analysis (PCA) of the matrix  $\Phi$ . In the PCA, the variance-covariance matrix of the decision problem, noted C, is first calculated. This matrix can be obtained by using the following relation:

$$(5) \quad nC = \Phi' \Phi$$

...where C: variance-covariance matrix

$\Phi'$ : the transposed matrix of  $\Phi$

n: positive integer

Then, two eigenvectors, noted  $\vec{u}$  and  $\vec{v}$ , are selected such as they have the greatest eigenvalues  $\lambda_1$  and  $\lambda_2$ . These two eigenvectors are orthogonal ( $\vec{u} \perp \vec{v}$ ) and define the best plane, called the GAIA plane, to use for the projection of the actions (the  $a_i$  points) while minimizing the loss of information (Brans and Mareschal 1994).

Every action of the decision problem will be projected in this plane and its coordinates are obtained as follows:

$$(6) \quad \begin{cases} \left| \overrightarrow{Op_i} \right| = \vec{a}_i' \cdot \vec{u} \\ \left| \overrightarrow{Oq_i} \right| = \vec{a}_i' \cdot \vec{v} \end{cases}$$

...where  $\vec{a}_i'$ : transposed row  $i$  of matrix  $\Phi$

In order to represent the intra criteria information, each criterion  $f_j$  will be projected to  $c_j$  on the GAIA plane. The angle between the projections of two criteria is a measure of similarity or conflict between the criteria. The smaller the angle, the more similar two criteria are. A large angle means conflicting criteria.

Finally, the information on the weights chosen by the decision-maker can be added by finding the projection of the weights vector:  $\vec{w}: (w_1, w_2, \dots, w_j, \dots, w_k)$ . The obtained vector is called a Decision Stick,  $\vec{D}$ , and represents the decision-maker's priorities:

$$(7) \quad \vec{D}: (\vec{w} \cdot \vec{u}, \vec{w} \cdot \vec{v})$$

The GAIA plane facilitates the decision aid process as easy conclusions can be drawn visually. Near actions on the plane will often have very similar rows in the variance-covariance matrix  $\Phi$ . The decision-maker can thus easily identify actions with similar or opposite performances. Moreover, the decision-maker can compare criteria since their position on the plane is an indication of their conflicting or correlated behavior. Their length represents their distinguishing power between actions. A wash criterion has a short length; a discriminating criterion has a long length.

## 5. Results and Discussion

For the 3 years of data, comprised of 69 formally completed projects (where subsidy has been paid, even though not all seem to have made all their potential employment claims) the data

is very limited in terms of the international dimension. This could be considered an artifact of the data period as there have been many completed international and co-production projects in the preceding and subsequent time period. However, their rarity in this 3 year period bears testimony to the uncertain and cyclical nature of these film project sources. Of the completed projects, the vast majority are domestic productions. QSAPE and the employment numbers have been converted to ratios by dividing through by the Subsidy amount paid.

The performance targets are QSAPE itself (spending in the South African economy) and Total employment, total black employment, total black skilled employment (i.e. minus extras). The latter 3 obviously co-move but nonetheless points of interest feature. These pertain to certain key themes that group around score bandings.

Essentially from the base case analysis (See Table 1 and Figure 1) where all criteria are equally weighted we have three discernible categories:

- 1) Projects scoring low in all criteria, which are the majority of projects
- 2) Projects scoring high in QSAPE and International co-production but scoring low on employment criteria (F43)
- 3) Projects scoring high in the employment criteria and scoring low in QSAPE and international co-production.

The only problem is that it is difficult to generalise because we have only one case in the second category. However, the analysis is also undertaken again and reported without *F43* to observe the impact.

Based on the ranking of various projects shown in Table 1, it is evident that, relative to other films in the data set, some do better in terms of QSAPE and black employment than others. They could thus be said to be fulfilling the objectives of the DTI (industry development and economic impact) and, to some extent, the NFVF (to increase the number of black people in the industry and to develop the skills base). The question remains, however, whether they are the “right” projects to subsidize in terms of the need to diversify content and to promote South African films both locally and internationally.

Analysis of the top 20 films in the list suggest that they are contributing to social and cultural debates and understanding in post-apartheid South Africa. The top three films are all comedies or romantic comedies set in South Africa and dealing with the challenges of living in a multicultural society. Two of the films are mostly in English, but incorporate other South African languages (with subtitles) as well. Although none of them were a great financial success or received great critical acclaim, they do deal with contemporary South African issues. Their contentious nature (examining such issues as inter-racial marriage, political issues, and differences in faith and culture) make them more likely to appeal to middle class audiences. Of the top 10, only two (the one foreign film in the sample, and a nature documentary) were not about contemporary South African or African life. Four of the films were serious dramas about such issues as struggles with poverty, homophobia and the drug trade. However, while the top 20 films represent a mix of different languages, four of the top 20 films are in Afrikaans – still a disproportionately large number given that only 13.5% of South Africans speak Afrikaans (SA Census 2011).

Scores below 0.1 comprise the majority of the projects – suggesting that what the subsidy is effectively doing is to support some temporary project jobs and frankly little else in terms of

economic development. Figure 1 depicts these scores in a GAIA plane format and clearly shows this score band grouping and the discriminating criteria. The individual contribution to the scores for each project is set out in Table 2 in a stacked bar chart.

Tables 3-5 and Figures 3-10 set out the results with altered weightings and with the exclusion of the singleton wholly international film project in the data period considered. These results show that despite double and quadruple weighting of the employment and black employment criteria, there is little change to the essential nature of the threefold score band categorization of the initial base run featuring equal criteria weighting.

Table 6 and Figures 11 and 12 set out the potential of this multicriteria and visualization method for modeling performance against a desired combination of project criteria.

Essentially a synthetic or fictional project is introduced into the analysis against which real project outcomes can be compared. The benchmark project features the real top scores on each criteria drawn from actual projects within the data. As can be seen from its score value and its relative isolation visually there is considerable distance between it and the real projects. This indicates a surprisingly considerable degree of orthogonality among the employment and project spending criteria. Accordingly, there exists potentially considerable policy tension among any partisan advocates of these objectives in the contemporary South African context.

## **6. Concluding Remarks**

The applicability of the PROMETHEE multi-criteria method, supported by GAIA plane visualization, for performance analysis of public policy and specifically public spending decisions, has been demonstrated in this study. It has been employed to analyze the full population of completed film and television broadcast projects eligible for state subsidy in South Africa. Some clear grouping among the projects can be discerned using the relevant

performance criteria articulated by South African Government bodies and agencies operating in this policy arena.

In retrospect, it should be borne in mind that the film and television productions that qualified for the subsidy are already a fairly select group. For example, in order to apply for the subsidy, local projects have to have a minimum QSAPE of R2.5m, which does exclude a significant range of smaller projects (Industry Interviews, 2012). Furthermore ‘subsidy eligible’ projects cannot be classed primarily as reality shows, game shows, or advertising even though these types of projects can support many jobs and substantial spending in the local economy. In terms of employment, films eligible for subsidy have to meet Broad-based black economic empowerment quotas, and thus already represent those projects with higher levels of black contributors. The director of the NFVF estimates that there a significant number of film and television projects that take place without subsidy. Accordingly, an illuminating line of future research enquiry is warranted whereby the comparative performance of projects that did qualify for subsidy is analyzed with those that did not.

In policy terms given there is considerable tension between the objectives of spending and employment or black skilled employment, one could consider that policy could be improved by differentiating the subsidy scheme further. For example, in evaluating subsidy applications, some might score highly on spending, so be allowed less weighting on employment. Subsidy, possibly for smaller projects spending less than R2.5m, may then also be made available for projects scoring high on black employment, but lower on spending.



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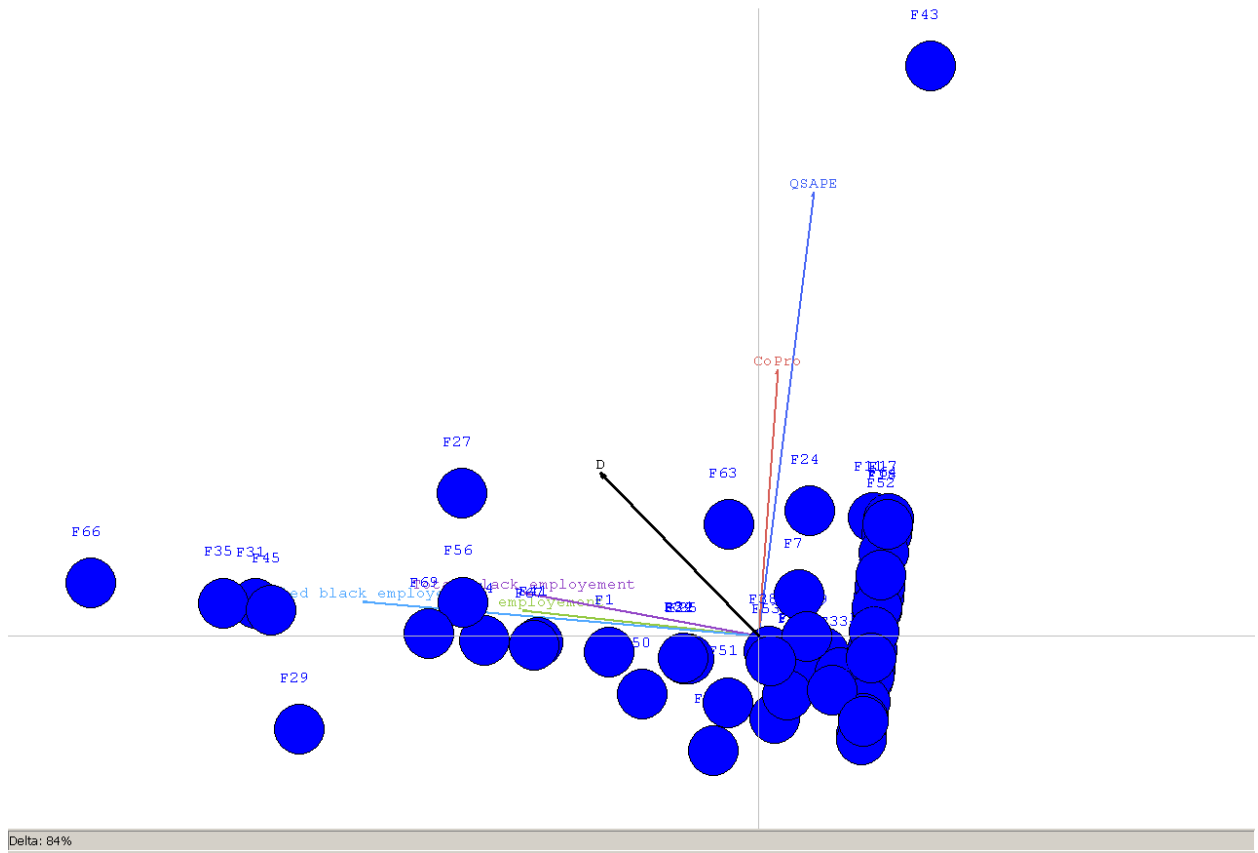
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**Table 1: Project Scores - Equal Weighting of All Criteria**

The score is relative and sum up to 0. This means that if we have only two films and one has a score of 0.5, then the second film will have a score of -0.5. F1 denotes Film Project 1

1	F66	0.44815
2	F35	0.34701
3	F31	0.33545
4	F45	0.33354
5	F43	0.27041
6	F27	0.21143
7	F29	0.19832
8	F56	0.19666
9	F69	0.16465
10	F44	0.12994
11	F41	0.12977
12	F67	0.10115
13	F63	0.07282
14	F1	0.06382
15	F24	0.03399
16	F50	0.02624
17	F34	0.02621
18	F25	0.02088
19	F22	0.01676
20	F7	0.00514
21	F11	-0.00482
22	F53	-0.01372
23	F17	-0.01452
24	F38	-0.01551
25	F64	-0.01726
26	F18	-0.01842
27	F51	-0.02028
28	F52	-0.02175
29	F40	-0.02305
30	F46	-0.02972
31	F59	-0.03018
32	F62	-0.04027
33	F6	-0.04094
34	F8	-0.0453
35	F32	-0.04553
36	F16	-0.04554
37	F48	-0.04823
38	F9	-0.04984
39	F5	-0.05031

40	F28	-0.05421
41	F36	-0.05482
42	F13	-0.05612
43	F49	-0.06577
44	F33	-0.06791
45	F65	-0.07234
46	F37	-0.07405
47	F60	-0.07744
48	F26	-0.08266
49	F12	-0.08583
50	F4	-0.08587
51	F19	-0.08591
52	F14	-0.08591
53	F20 i	-0.08591
54	F15	-0.08591
54	F47	-0.08591
56	F54	-0.08591
57	F21	-0.08591
58	F30	-0.08591
59	F23	-0.08591
60	F55	-0.08591
61	F2	-0.08741
62	F42	-0.09719
63	F58	-0.0972
64	F39	-0.09731
65	F3	-0.10447
66	F61	-0.10475
67	F68	-0.10624
68	F10	-0.11194
69	F57	-0.11453



**Fig 1: GAIA Plane – Equal Weighting of Criteria**

This is a projection on a plane and therefore some information will be distorted. In this case the accuracy is 84%.

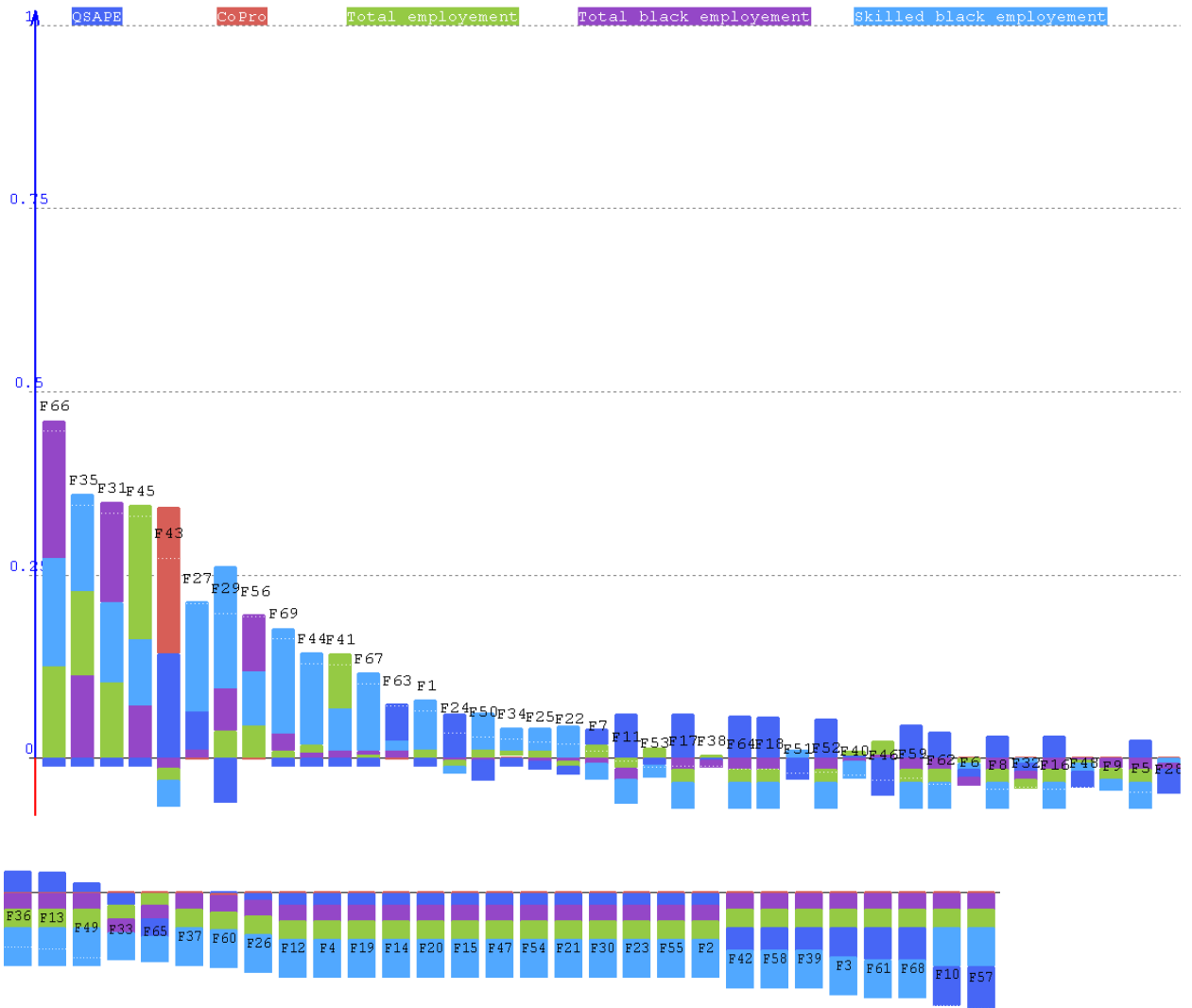


Fig 2: Project Scores and Individual Criteria Contribution



**Table 2: Project Scores: Total Black and Skilled Black Criteria Doubled Weighted**

1	F66	0.56069
2	F35	0.42285
3	F31	0.41476
4	F45	0.35545
5	F29	0.30267
6	F27	0.26657
7	F56	0.25078
8	F69	0.23854
9	F44	0.18797
10	F43	0.15571
11	F67	0.15141
12	F41	0.14229
13	F1	0.09296
14	F63	0.07029
15	F50	0.05198
16	F34	0.04193
17	F22	0.03948
18	F25	0.03294
19	F24	0.01426
20	F51	-0.00587
21	F46	-0.01693
22	F7	-0.01883
23	F38	-0.01984
24	F53	-0.02073
25	F40	-0.03762
26	F11	-0.03795
27	F6	-0.04353
28	F48	-0.04566
29	F32	-0.04574
30	F17	-0.04781
31	F64	-0.04977
32	F28	-0.05001
33	F18	-0.0506
34	F52	-0.05298
35	F9	-0.05653
36	F59	-0.059
37	F62	-0.06621
38	F8	-0.06979
39	F16	-0.06997
40	F5	-0.07338
41	F36	-0.07659
42	F33	-0.07728
43	F13	-0.07753

44	F65	-0.07904
45	F49	-0.08442
46	F37	-0.09033
47	F60	-0.09276
48	F26	-0.09648
49	F12	-0.09875
50	F4	-0.09878
51	F19	-0.0988
52	F14	-0.0988
53	F20	-0.0988
54	F15	-0.0988
54	F47	-0.0988
56	F54	-0.0988
57	F21	-0.0988
58	F30	-0.0988
59	F23	-0.0988
60	F55	-0.0988
61	F2	-0.09988
62	F42	-0.10686
63	F58	-0.10687
64	F39	-0.10695
65	F3	-0.11206
66	F61	-0.11226
67	F68	-0.11332
68	F10	-0.1174
69	F57	-0.11925

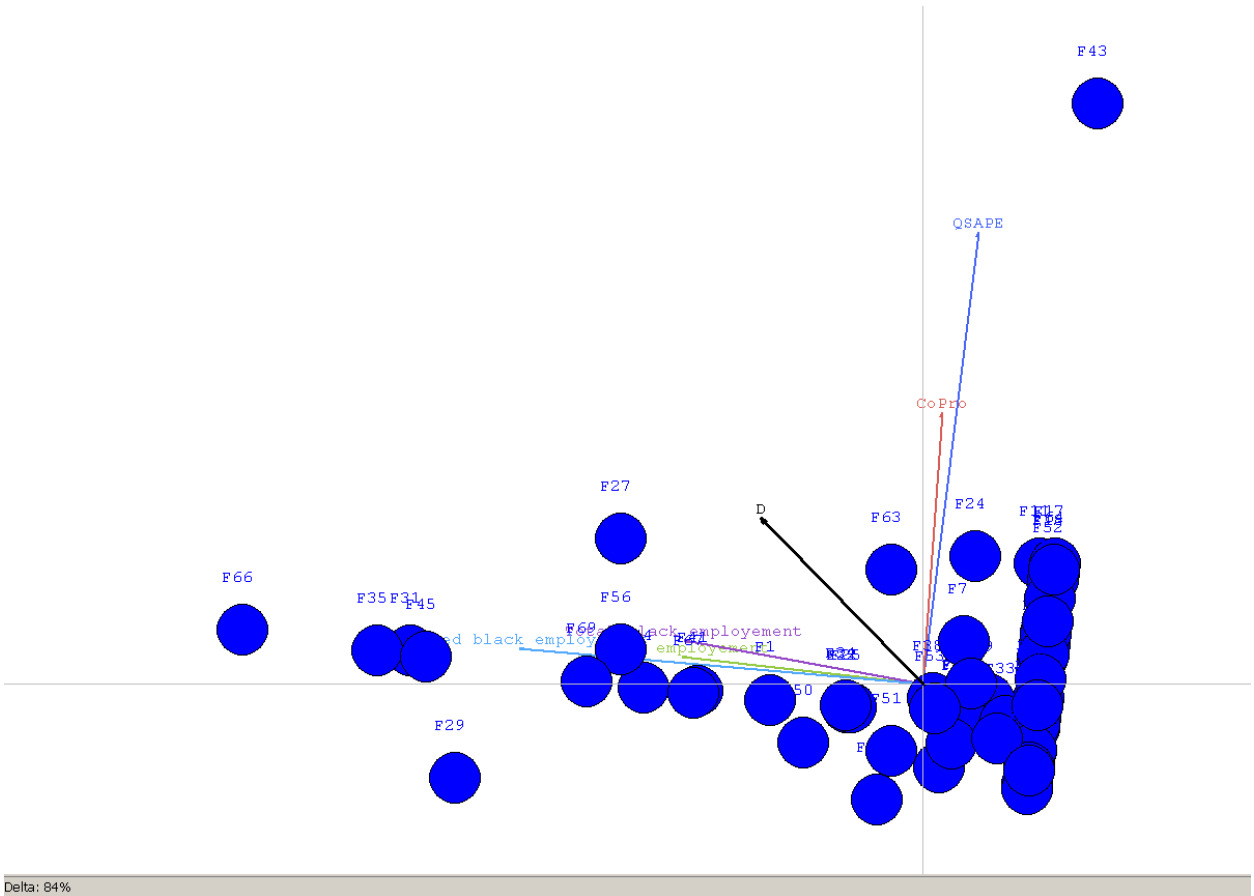
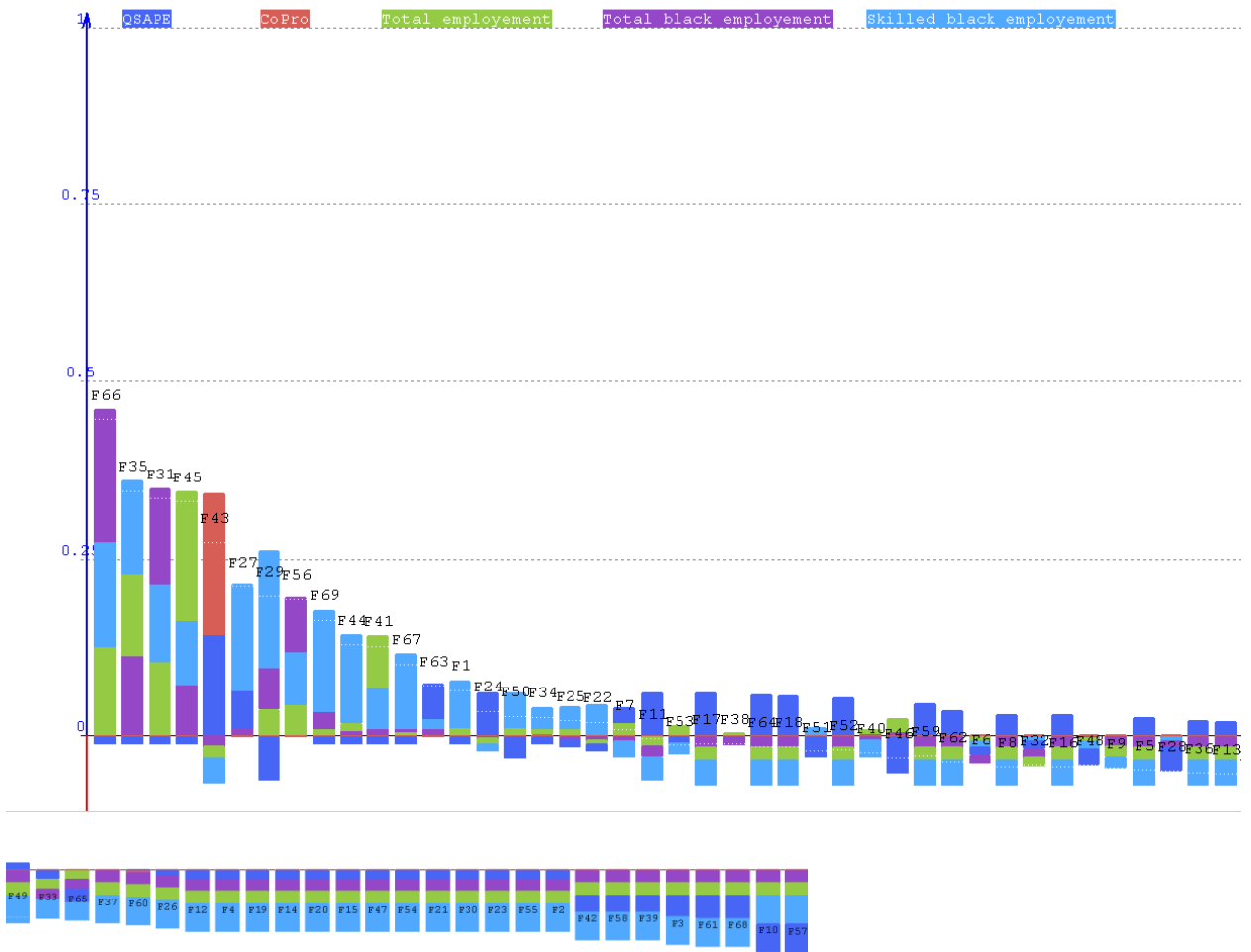


Fig. 3: GAIA Plane: Total Black and Skilled Black Criteria Doubled Weighted



**Fig 4: Project Scores and Contribution from Individual Criteria: Total Black and Skilled Black Criteria Doubled Weighted**

**Table 3: Equal Criteria Weighting Excluding F43 Project**

1	F66	0.45222
2	F35	0.35106
3	F31	0.3395
4	F45	0.33759
5	F27	0.21545
6	F29	0.20234
7	F56	0.20068
8	F69	0.16866
9	F44	0.13395
10	F41	0.13377
11	F67	0.10515
12	F63	0.07681
13	F1	0.06782
14	F24	0.03798
15	F50	0.03022
16	F34	0.03019
17	F25	0.02486
18	F22	0.02074
19	F7	0.00912
20	F11	-0.00085
21	F53	-0.00974
22	F17	-0.01054
23	F38	-0.01154
24	F64	-0.01329
25	F18	-0.01445
26	F51	-0.01631
27	F52	-0.01778
28	F40	-0.01908
29	F46	-0.02575
30	F59	-0.02621
31	F62	-0.0363
32	F6	-0.03697
33	F8	-0.04133
34	F32	-0.04157
35	F16	-0.04158
36	F48	-0.04426
37	F9	-0.04587
38	F5	-0.04634
39	F28	-0.05024
40	F36	-0.05085
41	F13	-0.05216
42	F49	-0.06181
43	F33	-0.06395

44	F65	-0.06838
45	F37	-0.07009
46	F60	-0.07348
47	F26	-0.0787
48	F12	-0.08187
49	F4	-0.08192
50	F19	-0.08195
51	F14	-0.08195
52	F20	-0.08195
53	F15	-0.08195
53	F47	-0.08195
55	F54	-0.08195
56	F21	-0.08195
57	F30	-0.08195
58	F23	-0.08195
59	F55	-0.08195
60	F2	-0.08345
61	F42	-0.09323
62	F58	-0.09324
63	F39	-0.09335
64	F3	-0.10051
65	F61	-0.1008
66	F68	-0.10228
67	F10	-0.10799
68	F57	-0.11058

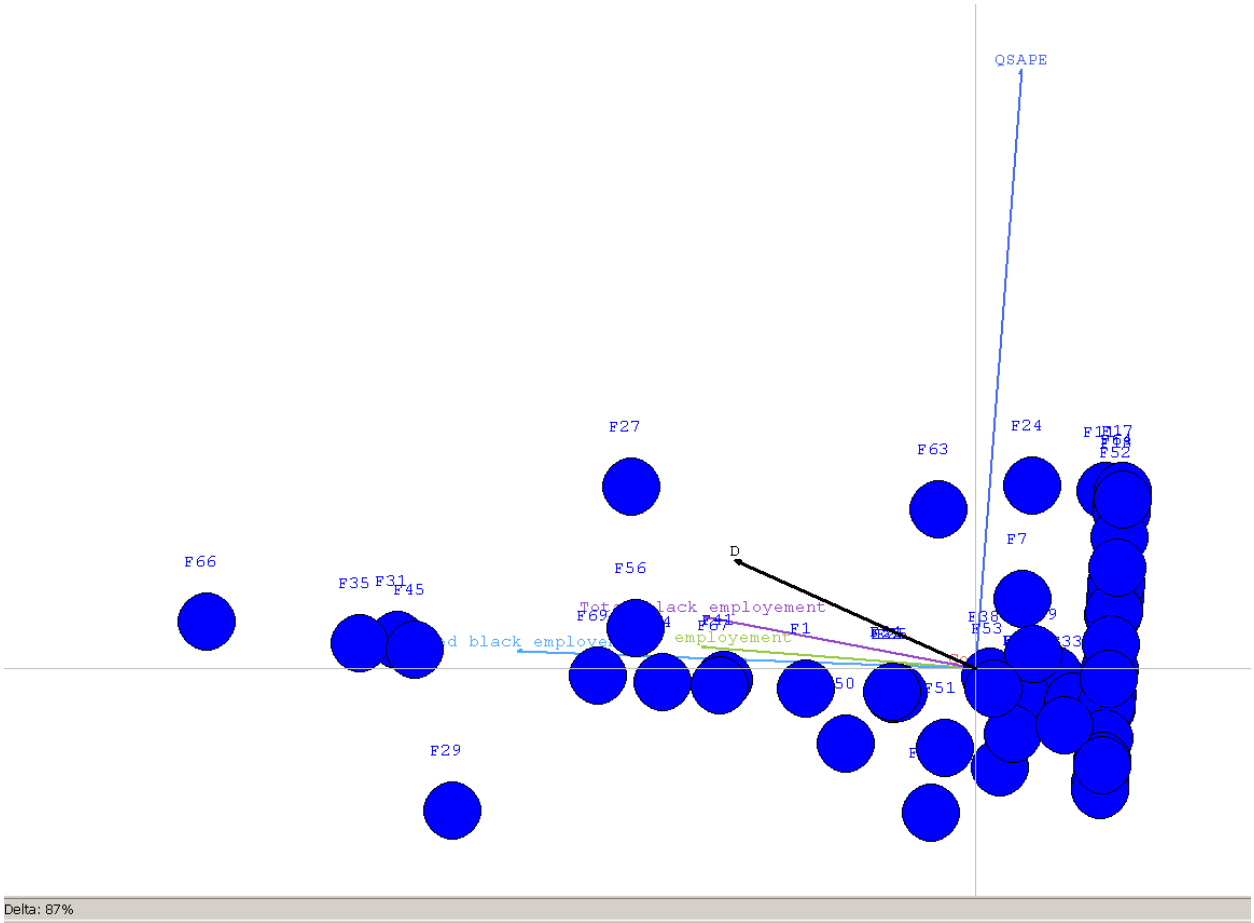
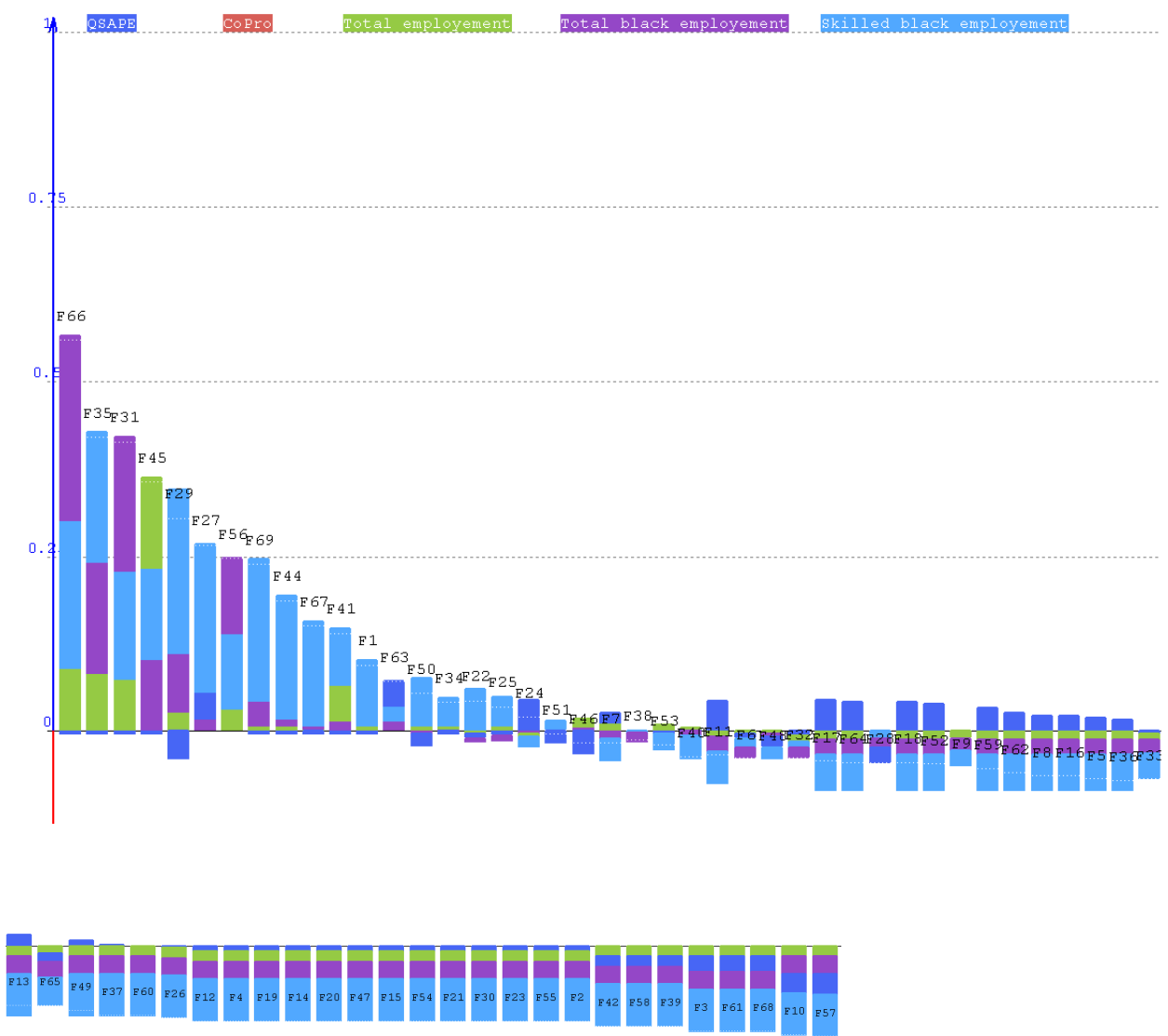


Figure 5: GAIA Plane - Equal Weighting Excluding F43 Project



**Figure 6: Project Scores and Individual Criteria Contribution - Equal Weighting of Criteria Excluding Schweitzer Project**



**Table 4: Total Employment Weighted 400%**

1	F45	0.55285
2	F66	0.51549
3	F35	0.43485
4	F31	0.40553
5	F41	0.22088
6	F56	0.20591
7	F29	0.19273
8	F43	0.13288
9	F27	0.13078
10	F69	0.12081
11	F44	0.10172
12	F67	0.07174
13	F1	0.06189
14	F63	0.04647
15	F50	0.0378
16	F7	0.03661
17	F25	0.03153
18	F34	0.03125
19	F53	0.01688
20	F46	0.01642
21	F24	0.00496
22	F38	-0.00242
23	F40	-0.00326
24	F22	-0.00364
25	F51	-0.01281
26	F11	-0.02768
27	F28	-0.03629
28	F6	-0.03818
29	F48	-0.04196
30	F17	-0.0452
31	F64	-0.04692
32	F18	-0.04764
33	F52	-0.04972
34	F32	-0.05249
35	F59	-0.05499
36	F9	-0.06028
37	F62	-0.0613
38	F8	-0.06444
39	F16	-0.0646
40	F5	-0.06757
41	F65	-0.06794
42	F33	-0.06848
43	F36	-0.07039

44	F13	-0.07121
45	F49	-0.07724
46	F37	-0.08241
47	F60	-0.08453
48	F26	-0.08779
49	F12	-0.08977
50	F4	-0.0898
51	F19	-0.08982
52	F14	-0.08982
53	F20	-0.08982
54	F47	-0.08982
54	F15	-0.08982
56	F54	-0.08982
57	F21	-0.08982
58	F30	-0.08982
59	F23	-0.08982
60	F55	-0.08982
61	F2	-0.09076
62	F42	-0.09687
63	F58	-0.09688
64	F39	-0.09695
65	F3	-0.10142
66	F61	-0.1016
67	F68	-0.10253
68	F10	-0.10609
69	F57	-0.10771

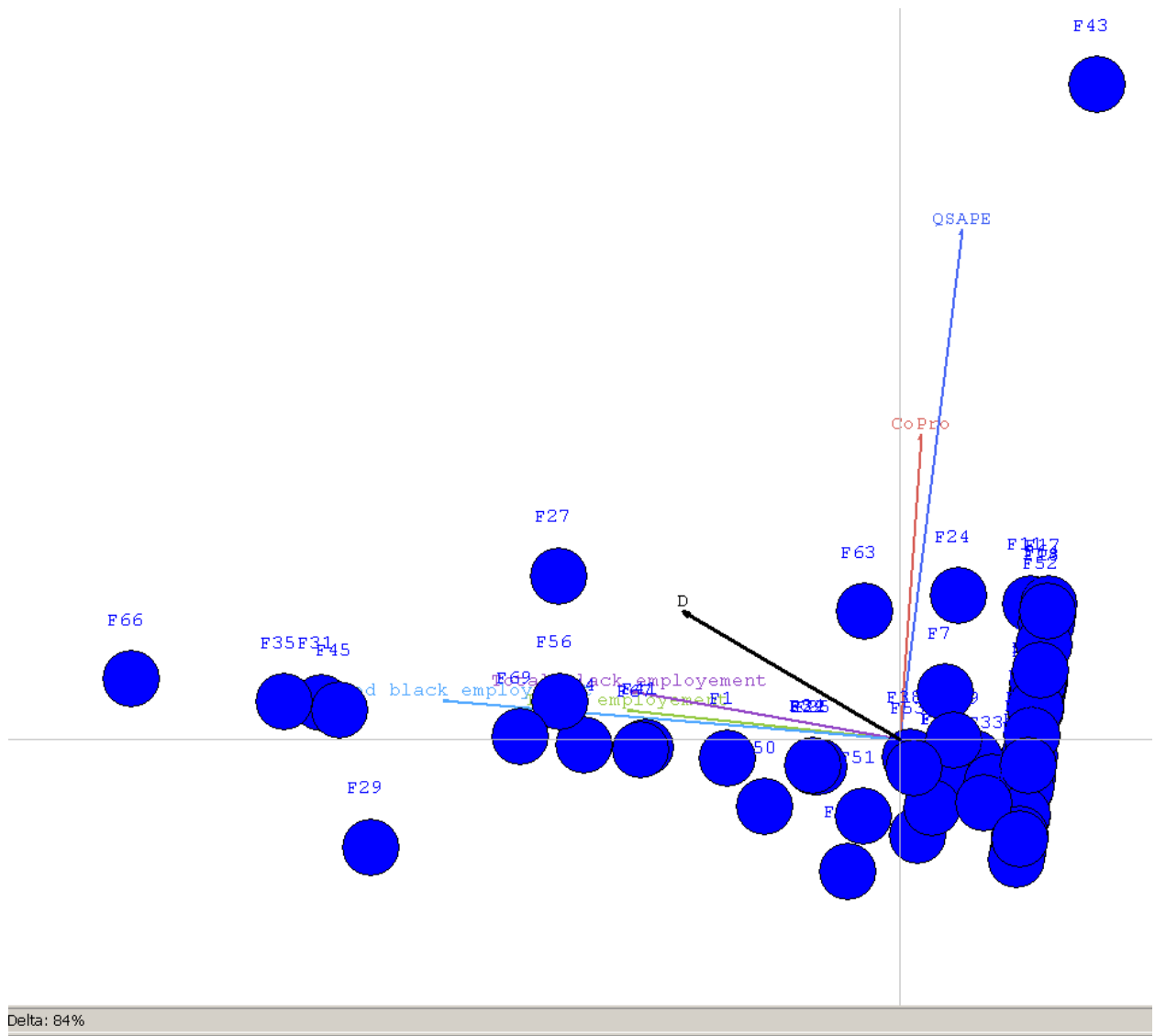


Figure 7: GAIA Plane – Total Employment Weighted 400%

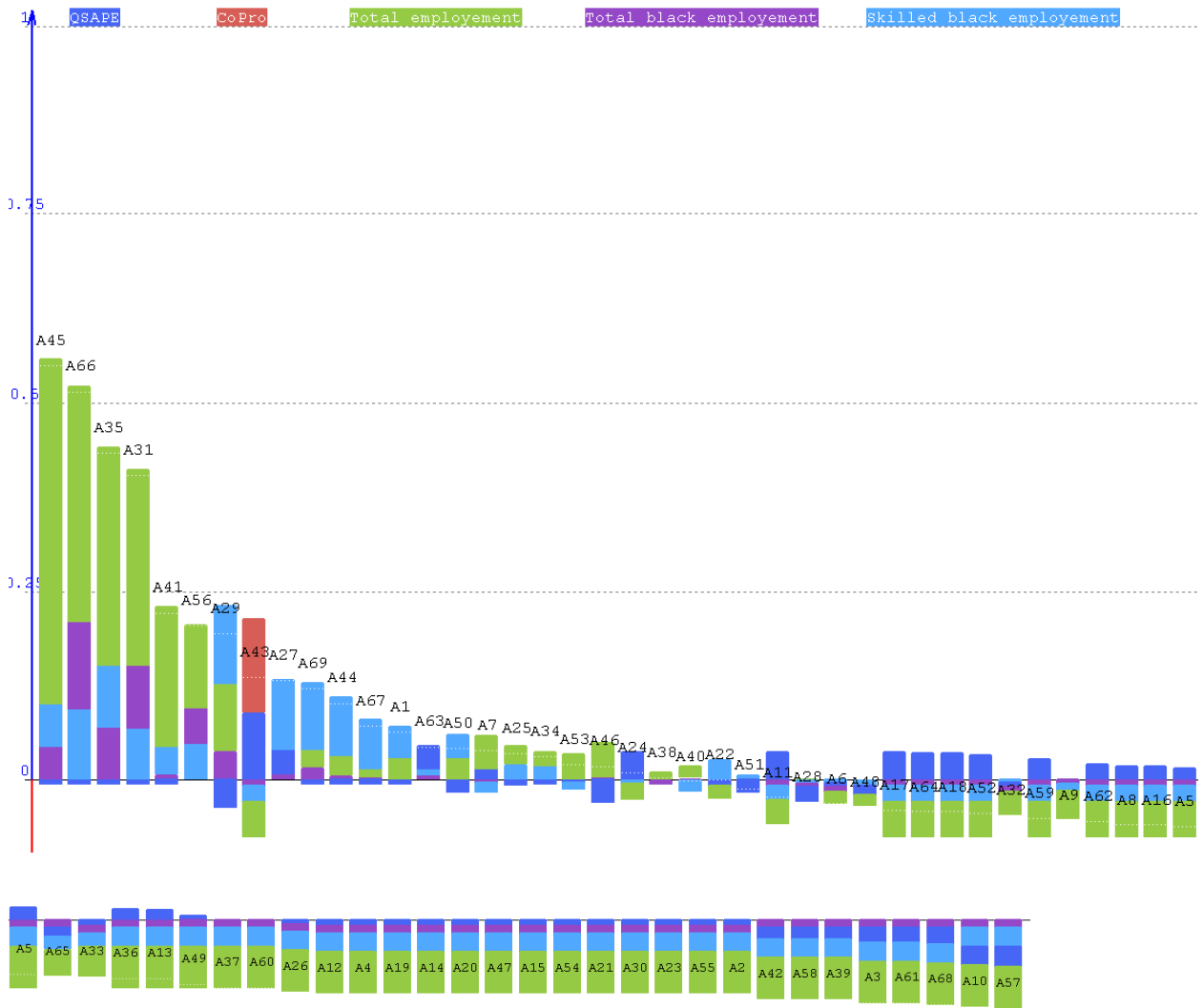


Figure 8: Project Scores and Individual Criteria Contribution: Total Employment Weighted 400%

**Table 5: Black employment Weighted 400%**

1	F66	0.63077
2	F31	0.4642
3	F35	0.42789
4	F45	0.34324
5	F56	0.26824
6	F29	0.23455
7	F27	0.15311
8	F69	0.15062
9	F43	0.13917
10	F41	0.10075
11	F44	0.09541
12	F67	0.0721
13	F63	0.06395
14	F1	0.03821
15	F34	0.02065
16	F24	0.01543
17	F50	0.01003
18	F22	0.0022
19	F25	0.00163
20	F53	-0.00606
21	F51	-0.00883
22	F46	-0.01001
23	F7	-0.01224
24	F40	-0.02437
25	F38	-0.02894
26	F11	-0.03188
27	F48	-0.03756
28	F17	-0.03891
29	F64	-0.04063
30	F18	-0.04135
31	F52	-0.04343
32	F6	-0.04691
33	F59	-0.0487
34	F32	-0.05025
35	F28	-0.05037
36	F62	-0.05501
37	F9	-0.05551
38	F8	-0.05815
39	F16	-0.0583
40	F5	-0.06128
41	F36	-0.0641
42	F13	-0.06492
43	F33	-0.06941

44	F49	-0.07094
45	F65	-0.07171
46	F37	-0.07612
47	F60	-0.07824
48	F26	-0.0815
49	F12	-0.08348
50	F4	-0.08351
51	F19	-0.08353
52	F14	-0.08353
53	F20	-0.08353
54	F47	-0.08353
54	F15	-0.08353
56	F54	-0.08353
57	F21	-0.08353
58	F30	-0.08353
59	F23	-0.08353
60	F55	-0.08353
61	F2	-0.08447
62	F42	-0.09058
63	F58	-0.09059
64	F39	-0.09066
65	F3	-0.09513
66	F61	-0.09531
67	F68	-0.09624
68	F10	-0.0998
69	F57	-0.10142

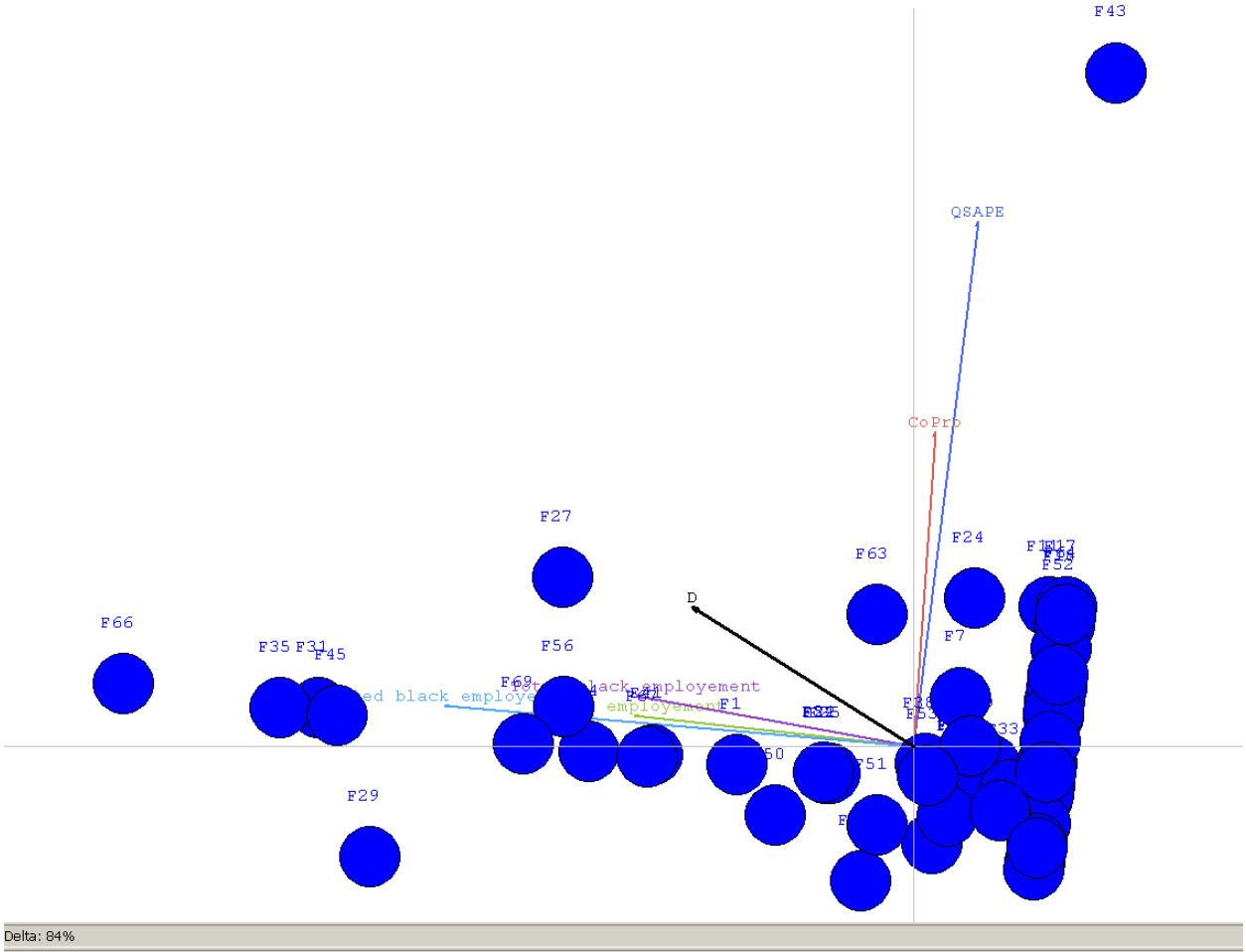


Figure 9: GAIA Plane – Black Employment Weighted 400%

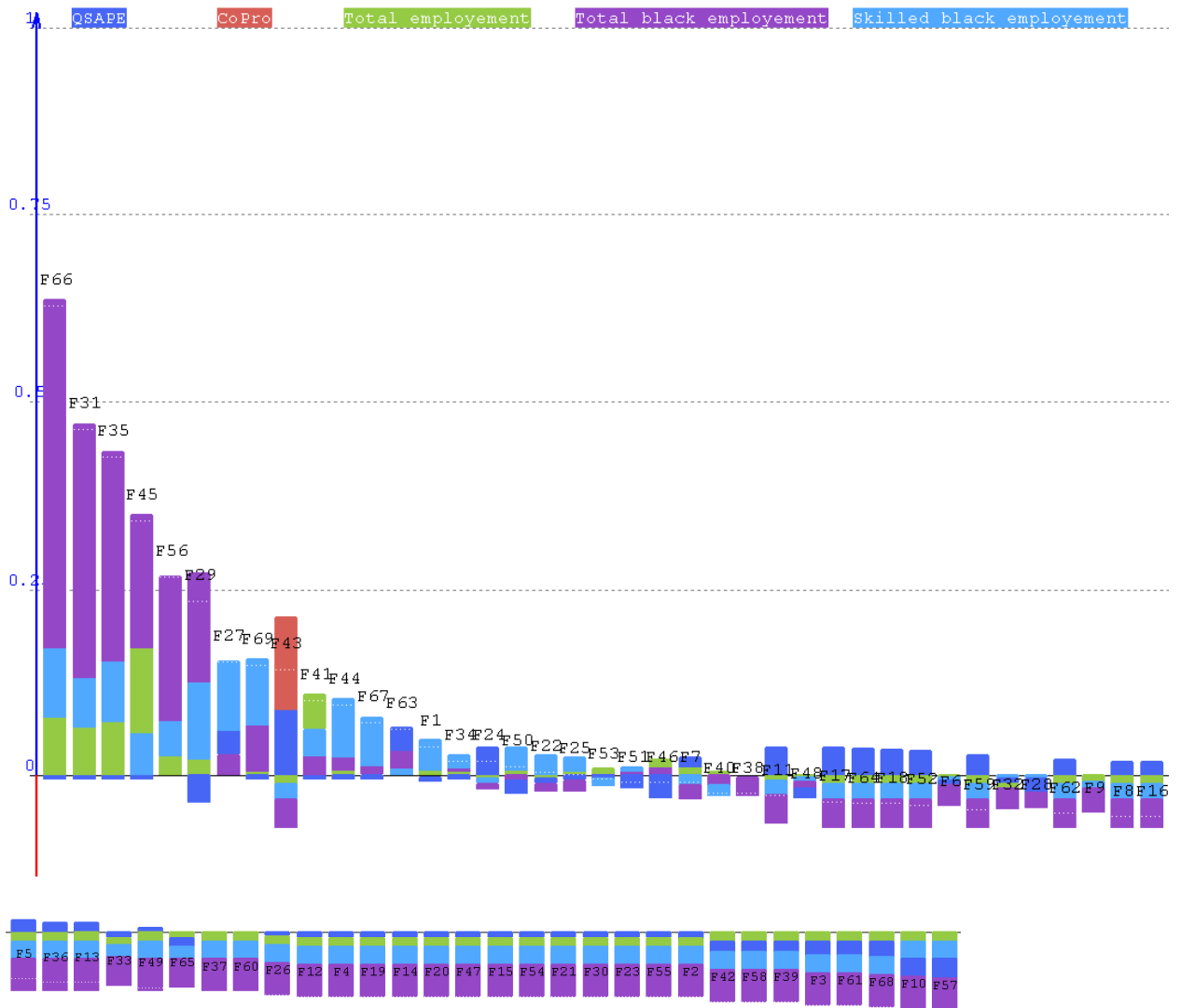


Figure 10: Project Scores with Individual Criteria Contribution – Black Employment Weighted 400%



**Table 6 – Project Scores with an ‘Ideal’ film as Benchmark**

1	F70 – ‘Ideal’ film	0.86649
2	F66	0.43549
3	F35	0.33438
4	F31	0.32283
5	F45	0.32091
6	F43	0.25779
7	F27	0.19882
8	F29	0.18572
9	F56	0.18406
10	F69	0.15205
11	F44	0.11735
12	F41	0.11718
13	F67	0.08857
14	F63	0.06025
15	F1	0.05125
16	F24	0.02143
17	F50	0.01368
18	F34	0.01364
19	F25	0.00831
20	F22	0.0042
21	F7	-0.00742
22	F11	-0.01738
23	F53	-0.02627
24	F17	-0.02707
25	F38	-0.02807
26	F64	-0.02982
27	F18	-0.03098
28	F51	-0.03284
29	F52	-0.0343
30	F40	-0.03561
31	F46	-0.04228
32	F59	-0.04273
33	F62	-0.05282
34	F6	-0.05349
35	F8	-0.05785
36	F32	-0.05808
37	F16	-0.05809
38	F48	-0.06078
39	F9	-0.06239
40	F5	-0.06286
41	F28	-0.06676
42	F36	-0.06736
43	F13	-0.06867

44	F49	-0.07831
45	F33	-0.08045
46	F65	-0.08488
47	F37	-0.08659
48	F60	-0.08998
49	F26	-0.0952
50	F12	-0.09837
51	F4	-0.09841
52	F19	-0.09845
53	F14	-0.09845
54	F20	-0.09845
55	F47	-0.09845
55	F15	-0.09845
57	F54	-0.09845
58	F21	-0.09845
59	F30	-0.09845
60	F23	-0.09845
61	F55	-0.09845
62	F2	-0.09995
63	F42	-0.10973
64	F58	-0.10973
65	F39	-0.10985
66	F3	-0.117
67	F61	-0.11729
68	F68	-0.11877
69	F10	-0.12448
70	F57	-0.12706

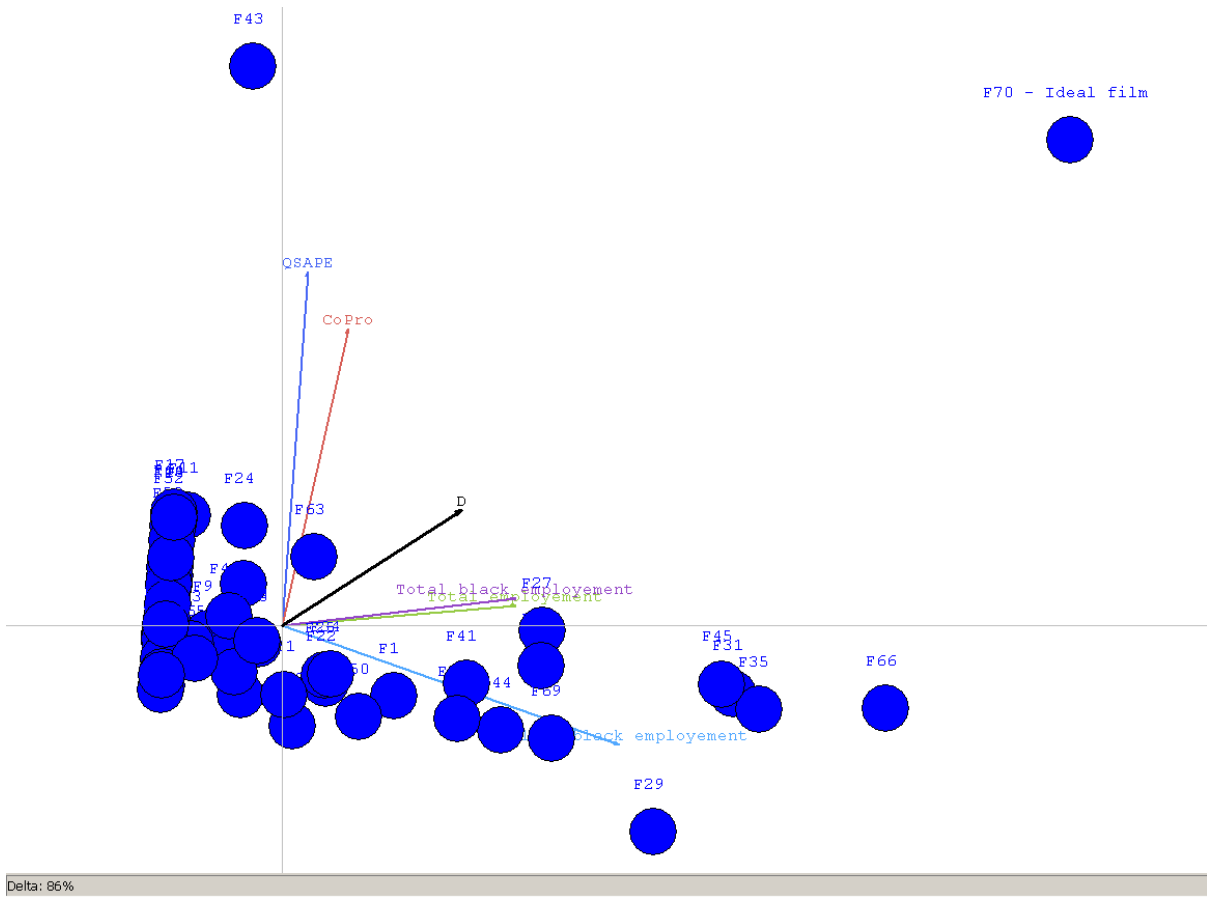


Figure 11: GAIA Plane with 'Ideal' Film Benchmark

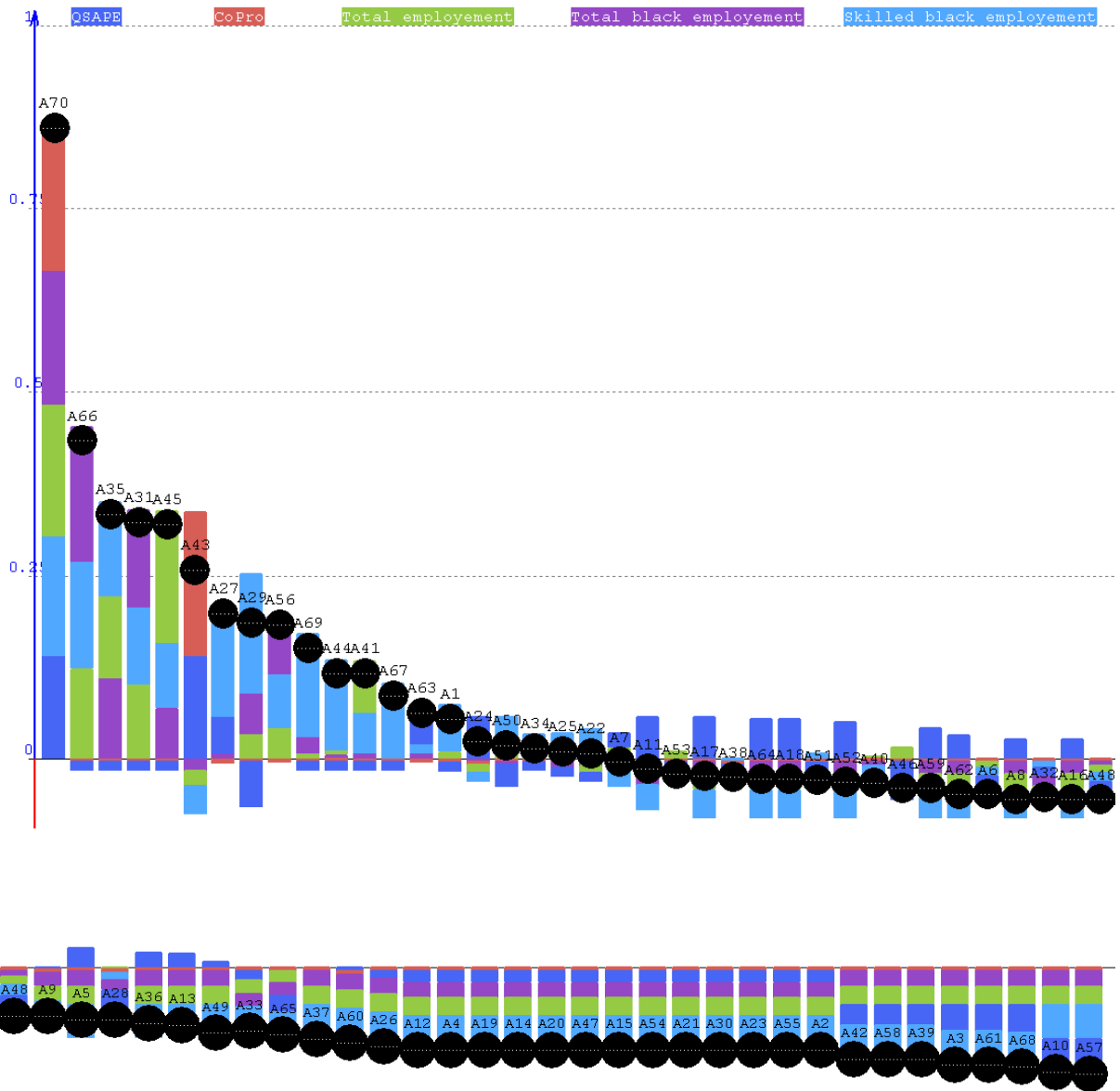


Figure 12: Project Scores with Individual Criteria Contribution – With ‘Ideal’ Film Project Benchmark